

## PRODUCT DESCRIPTION

KEMET's family of solid tantalum chip capacitors is designed and manufactured with the demanding requirements of surface mount technology in mind.

These devices extend the advantages of solid tantalum technology to today's surface mount circuit applications. Complementing multilayer ceramic chip convenience with capacitance ratings through 1500  $\mu\text{F}$ , tantalum chip capacitors permit circuit designers to take full advantage of the benefits of surface mount technology.

### **T491 Series — Industrial**

The leading choice in today's surface mount designs is the KEMET T491 Series. This product meets or exceeds the requirements of EIA standard 535BAAC. The physical outline and dimensions of this series conform to this global standard.

Five low profile case sizes are available in the T491 family. The R/2012-12, S/3216-12 and T/3528-12 case sizes have a maximum height of 1.2 mm. The U/6032-15 size has a maximum height of 1.5 mm, and the V/7343-20 has a maximum height of 2.0 mm.

This product was designed specifically for today's highly automated surface mount processes and equipment. This series uses the same proven solid tantalum KEMET technology acclaimed and respected throughout the world. Added to this is the latest in materials, processes and automation which result in a component unsurpassed worldwide in total performance and value.

The standard terminations are 100% matte tin and provide excellent wetting characteristics and compatibility with today's surface mount solder systems. Tin-Lead (SnPb) terminations are available upon request for any part number. Gold-plated terminations are also available for use with conductive epoxy attachment processes. The symmetrical terminations offer total compliancy to provide the thermal and mechanical stress relief required in today's technology. Lead frame attachments to the tantalum pellet are made via a microprocessor-controlled welding operation, and a high temperature silver epoxy adhesive system.

Standard packaging of these devices is tape and reel in accordance with EIA 481-1. This system provides perfect compatibility with all tape-fed placement units.

### **T492 Series — Military**

KEMET is approved to MIL-PRF-55365/8 (CWR11), Weibull failure rate "B" level or 0.1% failures per 1,000 hours, "C" level or 0.01% failures per 1,000 hours, and "D" level or 0.001% failures per 1,000 hours. This CWR11 product — designated as KEMET's T492 Series — is a precision-molded device, with compliant leadframe terminations and indelible laser marking. This is the military version of the global IEC/EIA standard represented by KEMET's T491 Series. Tape and reeling per EIA 481-1 is standard.

### **T493 Series — Military - COTS**

The T493 series is designed for the COTS (Commercial-Off-The-Shelf) requirements of military/aerospace applications. This series is a surface mount tantalum product offering various lead-frame surface finishes, Weibull grading and surge current testing options. The full part number includes a code defining the terminations, the Weibull reliability, surge test conditions, and the ESR range. The possible terminations include gold plated, hot solder dipped, solder plated, and solder fused. Reliability grading of B level (0.1%/kHours) and C level (0.01%/kHours) are available. Surge current testing options include: 10 cycles at 25°C, or 10-cycles at -55°C and +85°C. Both standard and low ESR options are available. All lots of this series are conditioned with MIL-PRF-55365 Group A testing.

### **T494 Series — Low ESR, Industrial Grade**

The T494 is a low ESR series that is available in all the same case sizes and CV ratings as the popular T491 series. The T494 offers low ESR performance with the economy of an industrial grade device. This series is targeted for output filtering and other applications that may benefit from improved efficiency due to low ESR.

### **T495 Series — Low ESR, Surge Robust**

The low ESR, surge robust T495 series is an important member of KEMET's tantalum chip family. Designed primarily for output filtering in switch-mode power supplies and DC-to-DC converters, the standard CV T495 values are also an excellent choice for battery-to-ground input filter applications.

This series builds upon proven technology used for industrial grade tantalum chip capacitors to offer several important advantages: very low ESR, high ripple current capability, excellent capacitance stability, plus improved ability to withstand high inrush currents. These benefits are achieved through a combination of proprietary design, material, and process parameters, as well as high-stress, low impedance electrical conditioning performed prior to screening. Capacitance values range from 4.7 $\mu\text{F}$  to 1000 $\mu\text{F}$ , in voltage ratings from 2.5 to 50 volts.

### **T496 Series — Fused**

KEMET also offers a "fail-safe" fused solid tantalum chip capacitor. The built-in fuse element provides excellent protection from damaging short circuit conditions in applications where high fault currents exist. Protection from costly circuit damage due to reversed installation is offered with this device. Package sizes include the EIA standard 3528-12, 6032-15, 7343-31, and 7343-43 case size. Capacitance values range from 0.15  $\mu\text{F}$  to 470.0  $\mu\text{F}$ , in voltage ratings from 4 to 50. Standard capacitance tolerances include  $\pm 20\%$  and  $\pm 10\%$ . Tape and reeling per EIA 481-1 is standard.

**PRODUCT DESCRIPTION****T498 SERIES - High Temperature (150° C)**

The T498 Series is a high temperature version of KEMET's solid tantalum chip family that offers optimal performance in applications with operating temperatures of up to 150° C. Advancements in materials and testing have allowed for the introduction of this series which delivers a reliability level of 0.5% per 1000 hours at rated voltage at rated temperature. This series is available in five standard EIA case sizes with RoHS-Compliant/100% matte tin finish lead terminations as standard. Other termination options include 90Sn/10Pb finishes and gold for conductive adhesive attachment processes. Capacitance values range from .47µF to 220µF, in voltage ratings from 4 to 50 volts.

**T510 Series — High Capacitance – Low ESR**

The ultra-low ESR T510 Series is a breakthrough in solid tantalum capacitor technology. KEMET's T510 Series offers low ESR in the popular EIA 7343-43 and 7360-38 case sizes. The ultra-low ESR and high ripple current capability make the T510 an ideal choice for SMPS filtering and power decoupling of today's high speed microprocessors.

KEMET has developed an innovative construction platform that incorporates multiple capacitor elements, in parallel, inside a single package. This unique assembly, combined with KEMET's superior processing technology, provides the best combination of high CV, low ESR, and small size in a user friendly, molded, surface mount package.

**T520 SERIES — Conductive Polymer**

The Kemet Organic Capacitor (KO-CAP) is a Tantalum capacitor, with a Ta anode and Ta<sub>2</sub>O<sub>5</sub> dielectric. However, a conductive, organic, polymer replaces the MnO<sub>2</sub> as the cathode plate of the capacitor. This results in very low ESR and improved cap retention at high frequency. The KO-CAP also exhibits a benign failure mode, which eliminates the ignition failures that can occur in standard MnO<sub>2</sub> Tantalum types. Note also that KO-CAPs may be operated at voltages up to 90% of rated voltage for

part types with rated voltage ≤ 10 volts and up to 80% of rated voltage for part types > 10 volts with equivalent or better reliability than standard tantalums operated at 50% of rated voltage.

The T520 series captures the best features of multilayer ceramic caps (low ESR and high frequency cap retention), aluminum electrolytics (benign failure mode), and proven solid tantalum technology (volumetric efficiency, surface mount capability, and no wearout mechanism). The KO-CAP can reduce component counts, eliminate through-hole assembly by replacing cumbersome leaded aluminum capacitors, and offer a more cost effective solution to high-cost high-cap ceramic capacitors. These benefits allow the designer to save both board space and money. See pages 42-52 for complete details.

**T525 SERIES — High Temperature Conductive Polymer**

The T525 Series is a version of KEMET's Tantalum Polymer Capacitor rated up to 125°C. This part type was introduced as Lead (Pb) Free and offers the same advantages as the T520 KO-CAP. This includes low ESR, high frequency capacitance retention and benign failure mode.

**T530 SERIES — Conductive Polymer High Capacitance — Ultra Low ESR**

KEMET is offering a multiple anode tantalum chip capacitor with a polymer material replacing the MnO<sub>2</sub> offering non-ignition, self-healing, 125°C performance capability with higher conductivity material that lowers the ESR. Packaged as multiple anodes to reduce the depth that the signal must penetrate, this parallel arrangement reduces the ESR further still to achieve the highest capacitance and lowest ESR of any other type of SMT capacitor with typical ESR values as low as 5 milliohms. With the reduced ESR, the enhanced capacitance retention in higher frequencies results in the lowest total capacitance solution and provides for the most economical solution in high power applications.

## TANTALUM MnO<sub>2</sub> COMPONENT PERFORMANCE CHARACTERISTICS

### Introduction

KEMET solid tantalum capacitors are identified by the initial “T,” followed by a unique “Series” number; for example, T491, T492, etc. Each Series denotes a general physical form and type of encapsulation, as well as limits on dimensions and certain electrical characteristics under standard conditions of 25°C, 50% relative humidity, and one atmosphere pressure. Specific requirements are set forth in the respective Product Series in this catalog. All series are 100% screened for leakage, capacitance, dissipation factor, and ESR. All Series are inspected to electrical limits using a minimum .1% AQL sampling plan, according to the Military Standard MIL-STD-105, even after 100% testing. This sampling plan, to the best of KEMET Electronics’ knowledge, meets or exceeds the generally accepted industry standard for similar products. KEMET capacitors may also be supplied, with prior agreement, to meet specifications with requirements differing from those of KEMET catalogs.

## ELECTRICAL

### 1. General Application Class

Solid tantalum capacitors are usually applied in circuits where the AC component is small compared to the DC component. Typical uses known to KEMET Electronics include blocking, by-passing, decoupling, and filtering. They are also used in timing circuits. General purpose devices are recommended to have an external series resistance of 0.1Ω/volt to reduce the failure due to surge current. Newer devices designed for power applications (T495, T5XX), are built to eliminate this series resistance requirement. Because tantalum capacitors can experience scintillation (self-healing) in their life, the circuit impedance should not exceed 100KΩ or this will circumvent the scintillation and degrade leakage.

### 2. Operating Temperature Range

- -55°C to +125°C

Voltage derating is specified in Section 5. Performance characteristics over this temperature range are presented within the following sections.

### 3. Non-Operating Temperature Range

- -55°C to +125°C

Tantalum capacitors do not lose capacitance from the “de-forming” effect as do liquid-electrolytic capacitors. Storage at high temperature may cause a small, temporary increase in leakage current (measured under standard conditions), but the original value is usually restored within a few minutes after application of rated voltage.

Tantalum chips are not hermetically sealed, therefore they do exhibit reversible changes in parameters with respect to relative humidity (RH). Capacitance increases with increasing humidity. The limiting change, reached upon establishment

of equilibrium with the environment, is approximately -5% to +12% over the range from 25% to 95% RH, referred to the standard 50% RH. The amount of change is dependent upon size (capacitance and voltage rating, ie: CV product); small sizes might change no more than ±5%. Equilibrium at such extremes is seldom attained by plastic-cased capacitors, and the change in capacitance is consequently less. The rate of response to humidity changes increases with increasing temperature. Dissipation factor and ESR also increase with increasing RH.

DC leakage current may rise upon exposure to a combination of high temperature and high humidity, but is normally restored by voltage conditioning under standard conditions. The increase will be greater than that experienced under temperature influence alone because of conduction through absorbed water.

Tantalum chips may be affected by absorption of water on external insulating surfaces. The water film may also attract a layer of dust from the air, increasing the effect. The most sensitive parameter is leakage current.

### 4. Capacitance

- 0.1 μF to 1000 μF

Refer to part number tables for available capacitance ratings and tolerances by series.

Capacitance is measured at 120 Hz, up to 1.0 volt rms maximum and up to 2.5 volts DC maximum, at +25°C. DC bias causes only a small reduction in capacitance, up to about 2% when full rated voltage is applied. DC bias is not commonly used at room temperature, but is more commonly used at elevated temperatures. Capacitance decreases with increasing frequency.

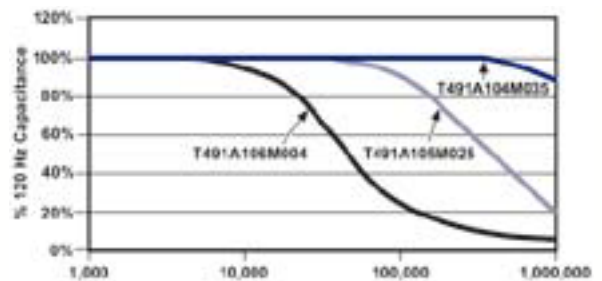


FIGURE 1 Typical Effect of Frequency upon Capacitance

Capacitance increases with increasing temperature.

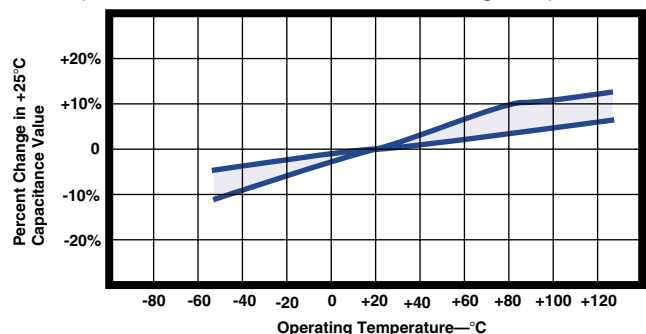


FIGURE 2 Typical Effect of Temperature upon Capacitance

**TANTALUM MnO<sub>2</sub> COMPONENT PERFORMANCE CHARACTERISTICS (con't.)**

**TABLE 1 Maximum Capacitance Change with Temperature (ref: 25 °C)**

| Ambient Temperature |       |                    |
|---------------------|-------|--------------------|
| -55°C               | +85°C | +125°C             |
| -10%                | +10%  | *+12% or +15%to20% |

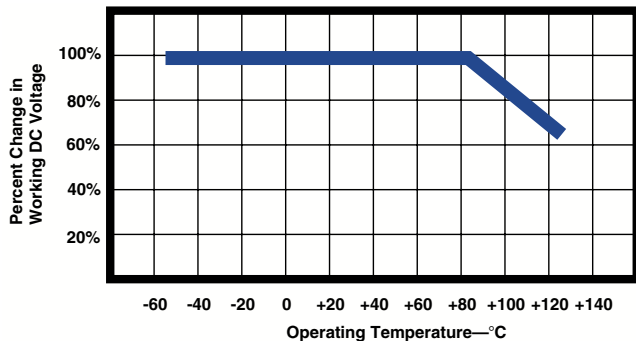
\*+12% is standard. +15% and 20% apply to certain extended CV values as noted in part number tables.

**5. Working DC Voltage (WVDC)**

**• 3 to 50 volts**

Refer to part number tables for available voltage ratings by series.

These voltages are the maximum recommended peak DC operating voltages from -55°C to +85°C for continuous duty. These voltages are derated linearly above +85°C to 2/3 rated voltage for operation at +125°C (See Figure 3). For added reliability it is recommended to operate at a 50% derating of the working voltage for tantalum capacitors with MnO<sub>2</sub> as a cathode. See page 39 for working DC Voltage of high temperature T498 product.



**FIGURE 3 Working DC Voltage Change with Temperature**

**6. Surge Voltage**

**TABLE 2 Surge Voltage Ratings at +25°C, +85°C & +125°C**

| Rated Working Volts @ +25°C & +85°C | Surge Voltage @ +25°C & +85°C | Derated DC Volts @ +125°C | Surge Voltage @ +125°C |
|-------------------------------------|-------------------------------|---------------------------|------------------------|
| 3                                   | 4                             | 2                         | 2.4                    |
| 4                                   | 5.2                           | 2.7                       | 3.2                    |
| 6                                   | 8                             | 4                         | 5                      |
| 10                                  | 13                            | 7                         | 8                      |
| 16                                  | 20                            | 10                        | 12                     |
| 20                                  | 26                            | 13                        | 16                     |
| 25                                  | 33                            | 17                        | 20                     |
| 35                                  | 46                            | 23                        | 28                     |
| 50                                  | 65                            | 33                        | 40                     |

Surge voltage tests are performed at +25°C, +85°C and +125°C with the applicable surge voltage. The surge voltage is applied for 1000 cycles of 30 seconds at voltage through a 33 ohm series resistor and 30 seconds off voltage with the capacitor discharged through a 33 ohm resistor. Upon completing the test, the capacitors are allowed to stabilize at room temperature. Capacitance, DCL and DF are then tested:

- a. Capacitance — within ± 5% of initial value
- b. DC Leakage — within initial limit
- c. Dissipation Factor — within initial limit
- d. ESR — within initial limit

**7. Reverse Voltage and Polarity**

**TABLE 3 Reverse Voltage Ratings**

| Temperature | Permissible Reverse Voltage |
|-------------|-----------------------------|
| +25°C       | <b>15% of Rated Voltage</b> |
| +85°C       | <b>5% of Rated Voltage</b>  |
| +125°C      | <b>1% of Rated Voltage</b>  |

Solid tantalum capacitors are polarized devices and may be permanently damaged or destroyed if connected with the wrong polarity. The positive terminal is identified on the capacitor body by a stripe and a beveled edge. A small degree of transient reverse voltage is permissible for short periods per Table 3. The capacitors should not be operated continuously in reverse mode, even within these limits.

**8. DC Leakage Current (DCL)**

Refer to part number tables for maximum leakage current limits.

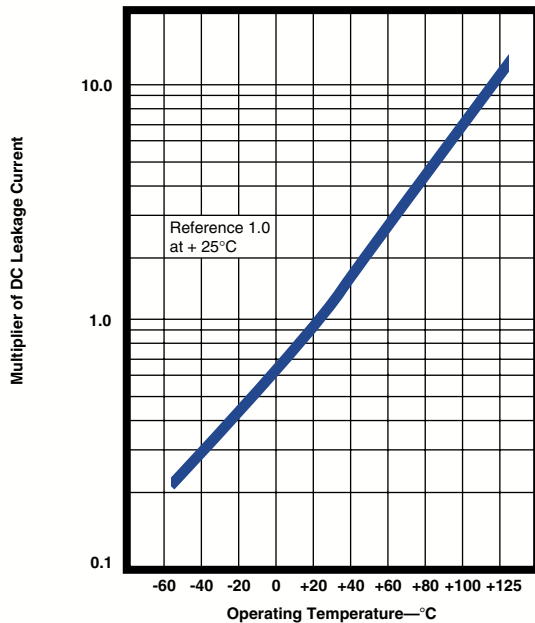
DC leakage current is the current that, after a one-to five-minute charging period, flows through a capacitor when voltage is applied. Leakage is measured at +25°C with full rated DC voltage applied to the capacitor through a 1000 ohm resistor in series with the capacitor.

DC leakage current increases with increasing temperature.

**TABLE 4 Leakage Limit Multipliers at Specified Temperatures (ref: 25 °C limits)**

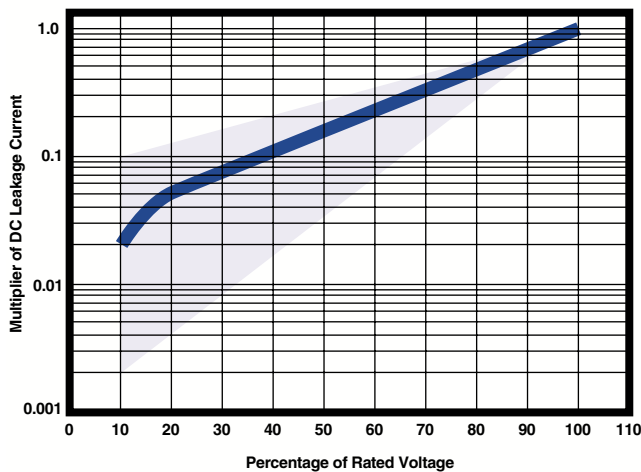
| Ambient Temperature |       |        |
|---------------------|-------|--------|
| -55°C               | +85°C | +125°C |
| N/A                 | 10X   | 12X    |

## TANTALUM MnO<sub>2</sub> COMPONENT PERFORMANCE CHARACTERISTICS (con't.)



**FIGURE 4** Typical Effect of Temperature upon DC Leakage Current

DC leakage current decreases with decreasing applied voltage.

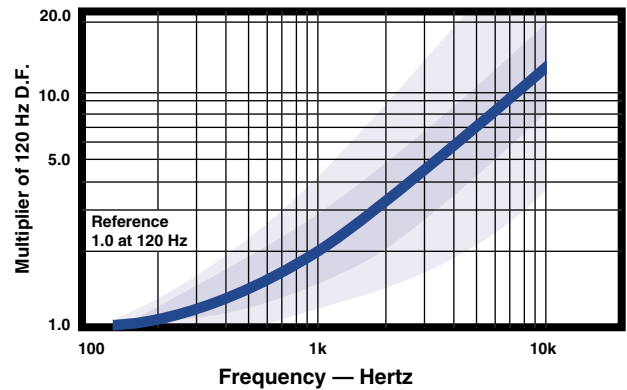


**FIGURE 5** Typical Effect of Applied Voltage on DC Leakage Current.

### 9. Dissipation Factor (DF)

Refer to part number tables for maximum DF limits.

Dissipation factor is measured at 120 Hz, up to 1.0 volt rms maximum, and up to 2.0 volts DC maximum at +25°C. The application of DC bias causes a small reduction in DF, about 0.2% when full rated voltage is applied. DF increases with increasing frequency.



**FIGURE 6** Typical Effect of Frequency upon Dissipation Factor

Dissipation factor is a very useful low frequency (120 Hz) measurement of the resistive component of a capacitor. It is the ratio of the equivalent series resistance (ESR) to the capacitive reactance, ( $X_c$ ) and is usually expressed as a percentage. It is directly proportional to both capacitance and frequency. Dissipation factor loses its importance at higher frequencies, (above about 1 kHz), where impedance ( $Z$ ) and equivalent series resistance (ESR) are the normal parameters of concern.

$$DF = \frac{R}{X_c} = 2\pi fCR$$

DF = Dissipation Factor  
 R = Equivalent Series Resistance (Ohms)  
 $X_c$  = Capacitive Reactance (Ohms)  
 f = Frequency (Hertz)  
 C = Series Capacitance (Farads)

DF is also referred to as  $\tan \delta$  or “loss tangent.” The “Quality Factor,” “Q,” is the reciprocal of DF.

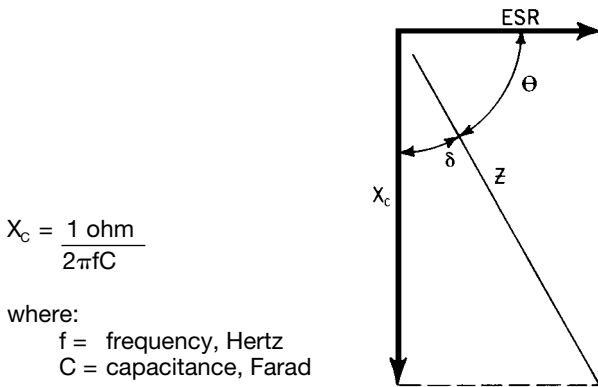
DF decreases with temperature above +25°C and may also increase at lower temperatures. Unfortunately, one general limit for DF cannot be specified for all capacitance/voltage combinations, nor can response to temperature be simply stated. DC bias is not commonly used at room temperature, but is more commonly used at elevated temperatures.

### 10. Equivalent Series Resistance (ESR) and Impedance (Z)

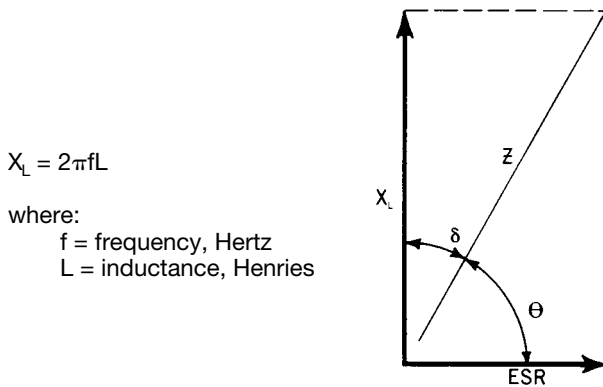
Equivalent Series Resistance (ESR) is the preferred high-frequency statement of the resistance unavoidably appearing in these capacitors. ESR is not a pure resistance, and it decreases with increasing frequency.

Total impedance of the capacitor is the vector sum of capacitive reactance ( $X_c$ ) and ESR, below resonance; above resonance total impedance is the vector sum of inductive reactance ( $X_l$ ) and ESR.

**TANTALUM MnO<sub>2</sub> COMPONENT PERFORMANCE CHARACTERISTICS (con't.)**

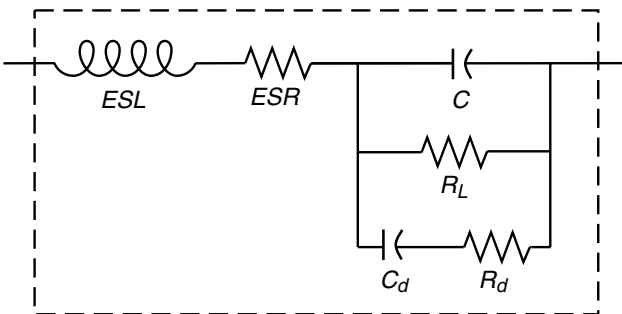


**FIGURE 7a Total Impedance of the Capacitor Below Resonance**



**FIGURE 7b Total Impedance of the Capacitor Above Resonance**

To understand the many elements of a capacitor, see Figure 8.



**FIGURE 8 The Real Capacitor**

A capacitor is a complex impedance consisting of many series and parallel elements, each adding to the complexity of the measurement system.

ESL — Represents lead wire and construction inductance. In most instances (especially in solid tantalum and monolithic ceramic capacitors) it is insignificant at the basic measurement frequencies of 120 and 1000 Hz.

ESR — Represents the actual ohmic series resistance in series with the capacitance. Lead wires and capacitor electrodes are contributing sources.

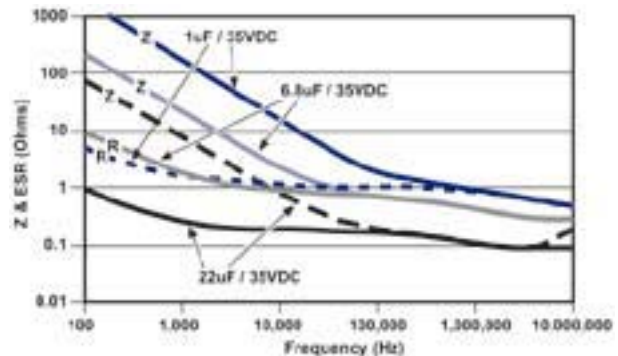
RL — Capacitor Leakage Resistance. Typically it can reach 50,000 megohms in a tantalum capacitor. It can exceed 10<sup>12</sup> ohms in monolithic ceramics and in film capacitors.

Rd — The dielectric loss contributed by dielectric absorption and molecular polarization. It becomes very significant in high frequency measurements and applications. Its value varies with frequency.

Cd — The inherent dielectric absorption of the solid tantalum capacitor which typically equates to 1-2% of the applied voltage.

As frequency increases, X<sub>c</sub> continues to decrease according to its equation above. There is unavoidable inductance as well as resistance in all capacitors, and at some point in frequency, the reactance ceases to be capacitive and becomes inductive. This frequency is called the self-resonant point. In solid tantalum capacitors, the resonance is damped by the ESR, and a smooth, rather than abrupt, transition from capacitive to inductive reactance follows.

Typical ESR/Z frequency response curves are shown in Figures 9a and 9b. These curves are for selected ratings and represent typical T491 Series performance. Maximum limits for 100 kHz ESR are listed in the part number tables for each series. Note that the T494 Series offers low ESR and the T495 Series is specially designed for very low ESR performance. Refer to page 31 for more information. See also KEMET's T510 Series low ESR ratings on page 40.



**FIGURE 9a ESR & Impedance (Z) vs Frequency**

## TANTALUM MnO<sub>2</sub> COMPONENT PERFORMANCE CHARACTERISTICS (con't.)

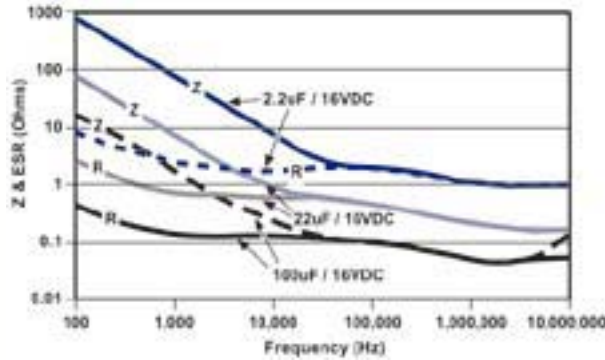


FIGURE 9b ESR & Impedance (z) vs Frequency

ESR and Z are also affected by temperature. At 100 kHz, ESR decreases with increasing temperature. The amount of change is influenced by the size of the capacitor and is generally more pronounced on smaller ratings.

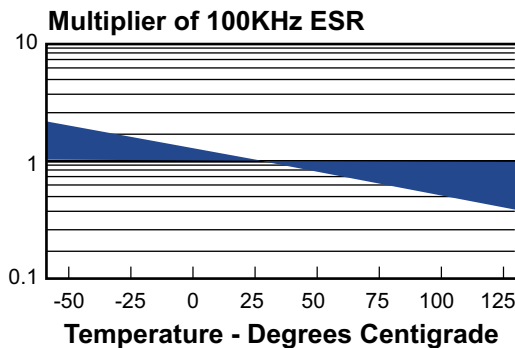


FIGURE 10 Typical Effect of Temperature on 100 kHz ESR

### 11. AC Power Dissipation

Power dissipation is a function of capacitor size and materials. Maximum power ratings have been established for all case sizes to prevent overheating. In actual use, the capacitor's ability to dissipate the heat generated at any given power level may be affected by a variety of circuit factors. These include board density, pad size, heat sinks and air circulation.

TABLE 5 Tantalum Chip Power Dissipation Ratings

| Case Code    |         | Maximum Power Dissipation<br>mW @ +25°C w/+20°C Rise |
|--------------|---------|--|
| KEMET        | EIA     |  |
| R            | 2012-12 | 25   |
| S            | 3216-12 | 60   |
| T            | 3528-12 | 70   |
| U            | 6032-15 | 90   |
| V            | 7343-20 | 125  |
| A            | 3216-18 | 75   |
| B            | 3528-21 | 85   |
| C            | 3062-28 | 110  |
| D            | 7343-31 | 150  |
| X            | 7343-43 | 165  |
| E            | 7260-38 | 200  |
| T530D        | 7343-31 | 255  |
| T510X, T530X | 7343-43 | 270  |
| T510E, T530E | 7260-38 | 285  |

### 12. AC Operation

Permissible AC ripple voltage and current are related to equivalent series resistance (ESR) and power dissipation capability.

Permissible AC ripple voltage which may be applied is limited by three criteria:

- The positive peak AC voltage plus the DC bias voltage, if any, must not exceed the DC voltage rating of the capacitor.
- The negative peak AC voltage, in combination with the bias voltage, if any, must not exceed the permissible reverse voltage ratings presented in Table 3.
- The power dissipated in the ESR of the capacitor must not exceed the appropriate value specified in Table 5.

Actual power dissipated may be calculated from the following:

$$P = I^2 R$$

$$\text{Substituting } I = \frac{E}{Z}, \quad P = \frac{E^2 R}{Z^2}$$

where:

I = rms ripple current (amperes)

E = rms ripple voltage (volts)

P = power (watts)

Z = impedance at specified frequency (ohms)

R = equivalent series resistance at specified frequency (ohms)

Using P max from Table 5, maximum allowable rms ripple current or voltage may be determined as follows:

$$I (\text{max}) = \sqrt{P \text{ max}} / R \quad E (\text{max}) = Z \sqrt{P \text{ max}} / R$$

These values should be derated at elevated temperatures as follows:

| Temperature | Derating Factor |
|-------------|-----------------|
| 85°C        | .9              |
| 125°C       | .4              |

## ENVIRONMENTAL

### 13. Temperature Stability

TABLE 6 Temperature Stability Limits

| Step No. | Temp.  | Δ Capacitance                         | Leakage Current           | Dissipation Factor       |
|----------|--------|---------------------------------------|---------------------------|--------------------------|
| 1        | +25°C  | within specified tolerance            | within original limit     | within original limit    |
| 2        | -55°C  | within ± 10% of initial value         | N/A                       | within original limit**  |
| 3        | +25°C  | within ± 5% of initial value          | within original limit     | within original limit**  |
| 4        | + 85°C | within ± 10% of initial value         | within 10X original limit | within original limit*** |
| 5        | +125°C | *within ± 12% or 20% of initial value | within 12X original limit | within original limit*** |
| 6        | +25°C  | within ± 5% of initial value          | within original limit     | within original limit    |

+12% is standard. +15% or +20% applies to certain CV values  
**Contact KEMET representative for details.**

\*\*within 1.5x initial limit for extended CV values.

\*\*\*within 1.15x initial limit for extended CV values.

## TANTALUM MnO<sub>2</sub> COMPONENT PERFORMANCE CHARACTERISTICS (con't.)

Mounted capacitors withstand extreme temperature testing at a succession of continuous steps at +25°C, -55°C, +25°C, +85°C, +125°C, +25°C, in the order stated. Capacitors shall be brought to thermal stability at each test temperature. Capacitance, DF and DCL are measured at each test temperature except that DCL is not measured at -55°C. DC bias of 2.0± 0.5 is recommended for the capacitance and D F requirements.

### 14. Thermal Shock

- *Mil-Std-202, Method 107, Condition B*

Minimum temperature -55°C, mounted

Post Test Performance:

- Capacitance — within ±5% of initial value
- DC Leakage — within initial limit
- Dissipation Factor — within initial limit
- ESR — within initial limit

### 15. Moisture Resistance

- *Mil-Std-202, Method 106*

Steps 7a and 7b excluded, rated voltage, 42 cycles, mounted

Post Test Performance:

- Capacitance — within ±10% of initial value
- DC Leakage — within initial limit
- Dissipation Factor — within initial limit
- ESR — within initial limit

- *JEDEC J-STD-20C — meets MSL1 for Pb-free assembly*

### 16. Electrostatic Discharge (ESD)

- *Human Body Model*  
*2,000 ±50 volts, 1,500 ±5% ohms, 40 nanosecond pulse each polarity, 1 pulse each polarity, 5 seconds between pulses, +25°C.*
- *Charged Device Model*  
*200 ± 5 volts, 0 ohms, 40 nanosecond pulse, each polarity, 9 pulses each polarity, 5 seconds between pulses, +25°C.*

**Product subjected to above test condition demonstrate *no sensitivity* to electrostatic discharge.**

### 17. Long Term Stability

Within the general class of electrolytic capacitors, solid tantalum capacitors offer unusual stability of the three important parameters: capacitance, dissipation factor and leakage current. These solid-state devices are not subject to the effects of electrolysis, deforming or drying-out associated with liquid-electrolyte capacitors.

When stabilized for measurement at standard conditions, capacitance will typically change less than ±3% during a 10,000 hour life test +85°C.

The same comparative change has been observed in shelf tests at +25°C extending for 50,000 hours. (Some of this change may stem from instrument or fixture error.)

Dissipation factor exhibits no typical trend. Data from 10,000 hour life test at +85°C show that initial limits (at standard conditions) are not exceeded at the conclusion of these tests.

Leakage current is more variable than capacitance or DF; in fact, leakage current typically exhibits a logarithmic dependence in several respects. Military Specifications permit leakage current (measured at standard conditions) to rise by a factor of four over 10,000 hour life tests. Typical behavior shows a lower rate of change, which may be negative or positive. Initial leakage currents are frequently so low (less than 0.1 nanoampere in the smallest CV capacitors) that changes of several orders of magnitude have no discernable effect on the usual circuit designs.

### 18. Failure Mode

Capacitor failure may be induced by exceeding 50% of rated voltage of the capacitor with forward DC voltage, reverse DC voltage, power dissipation, or temperature. As with any practical device, these capacitors also possess an inherent, although low, failure rate when operated at less than 50% of the rated voltage of the capacitor.

The dominant failure mode is by short-circuit. Minor parametric drifts are of no consequence in circuits suitable for solid tantalum capacitors. Catastrophic failure occurs as an avalanche in DC leakage current over a short (millisecond) time span. The failed capacitor, while called “short-circuited”, may exhibit a DC resistance of 10 to 10<sup>4</sup> ohm.

If a failed capacitor is in an unprotected low-impedance circuit, continued flow of current through the capacitor may obviously produce severe overheating. The over-heated capacitor may damage the circuit board or nearby components. Protection against such occurrence is obtained by current-limiting devices or fuses provided by the circuit design. KEMET’s T496 series offers a built-in fuse to convert the normal short circuit failure mode to an open circuit.

Fortunately, the inherent failure rate of KEMET solid tantalum capacitors is low, and this failure rate may be further improved by circuit design. Statistical failure rates are provided for military capacitors. Relating circuit conditions to failure rate is aided by the guides in the section following.



## TANTALUM MnO<sub>2</sub> COMPONENT PERFORMANCE CHARACTERISTICS (con't.)

### RELIABILITY

#### 19. Reliability Prediction

Solid tantalum capacitors exhibit no degradation failure mode during shelf storage and show a constantly decreasing failure rate (i.e., absence of any wear out mechanism) during life tests. This failure rate is dependent upon three important application conditions; DC Voltage, ambient temperature, and circuit impedance. Additional effects are attributable to the capacitance of the device and atmospheric and mechanical exposure of the assembled circuit. The 1000 multiplier at the end converts the failure rate to parts-per-billion piece-hours. A prediction of the failure rate can be made using these application conditions and the formulas and tables listed in MIL-HDBK-217F (Notice 2).

**Base Multiplier:** The first multiplier is the base multiplier (2) established for the capacitor type. For “CWR-Chips” or surface mount components the base multiplier is 0.00005, and for “CSR-Leaded” devices, the base multiplier is 0.00040.

**Temperature:** The temperature factor is given as (3). From this formula, it can be seen that the unity factor, or 1, is derived at an ambient temperature of +25°C (+298°K), and that at temperatures below this the multiplier is decreasing and at temperatures above this the multiplier is increasing.

**Voltage:** The multiplier for application voltage (4) is a two step process: first, the application voltage is compared to 60% of rated voltage, and then this ratio is raised to an exponential power of 17 and added to unity. Consider applications of 50%, 60%, 70%, 80% and 90% of rated voltage. The multipliers for these applications would be 1.045, 2.00, 14.7, 134, and 986, respectively. From these results it is evident why manufacturers recommend application voltages not to exceed 50% rated voltages.

**Capacitance:** There is a factor (5) applied to the capacitance (in µF) which effectively increases the failure rate for increasing capacitance (increases in effective area resulting in increases in possible faults).

**Series Resistance:** The series resistance is only concerned with the resistance per application bias (ohms per volt) external to the capacitor, and does not include the ESR as a factor.

**Environmental:** The environmental factor is determined by the harshness of the ambient conditions beyond temperature. An explanation of these ratings is included in the MIL specification and are too extensive to be covered here. In most cases, this factor is set to ground benign or G<sub>B</sub>, with the resulting factor equal to “1”.

- (1)  $\lambda_v = \lambda_b \pi_\tau \pi_c \pi_v \pi_{SR} \pi_Q \pi_E \times 1000$
- (2)  $\lambda_b = 0.00005_{CWR}$  or  $0.0004_{CSR}$
- (3)  $\pi_\tau = \exp \left[ \frac{-0.15}{8.617 \cdot 10^{-5}} \left( \frac{1}{T_{Amb}} - \frac{1}{298} \right) \right]$
- (4)  $S = \frac{\text{Application-Voltage}}{\text{Rated-Voltage}} \quad \pi_v = \left( \frac{S}{0.6} \right)^{17} + 1$
- (5)  $\pi_c = 1.0 \cdot C^{0.23}$
- (6)  $\pi_{SR} = \text{Lookup Table} \quad \pi_E = \text{Lookup Table}$
- (7)  $\pi_Q = \sqrt[4]{ \left( \frac{\text{Pcs. Fail}}{\text{Pcs. Tested} \times \text{Hrs. Tested}} \times 100,000 \right)}$

FIGURE 11a. MIL-HDBK-217F Notice 2 formulas.

| CR (ΩV) | π <sub>SR</sub> |
|---------|-----------------|
| >0.8    | 0.66            |
| 0.6-0.8 | 1.0             |
| 0.4-0.6 | 1.3             |
| 0.2-0.4 | 2.0             |
| 0.1-0.2 | 2.7             |
| <0.1    | 3.3             |

FIGURE 11b. Table for circuit resistance multipliers.

**Quality Factor:** All of these multipliers are applied to the established or base failure rate of the part. The T492 Series is qualified under U.S. military specification MIL-PRF-55365. Failure rates as low as 0.001% kHr are available under this test program.

For series not covered by military specifications, an internal sampling program is operated by KEMET Quality Assurance whereby parts are put on life test at rated voltage for 2000 hours. The confidence level chosen for the reporting data is 60%. (The cost of sampling each batch would be prohibitive, and no claim is made to guarantee the failure rate of each batch.) With this testing and each new qualification test for new parts, the average failure rate for all commercial Series lies between 0.1% and 1.0% per thousand-piece-hours.

#### **FIT Calculator**

All of these factors are gathered into a Windows based software, available free from the KEMET web site (www.kemet.com). The “FIT Calculator” software does all the calculations and look-ups based on information entered or selected by the operator. A manual may also be downloaded from the same web page to explain the controls and displays. The manual as well as a help screen also detail the environmental conditions.

**TANTALUM MnO<sub>2</sub> COMPONENT PERFORMANCE CHARACTERISTICS (con't.)**

**20. Surge Current**

All conventional reliability testing is conducted under steady-state DC voltage. Experience indicates that AC ripple, within the limits prescribed, has little effect on failure rate. Heavy surge currents are possible in some applications, however. Circuit impedance may be very low (below the recommended 0.1 ohm/volt) or there may be driving inductance to cause voltage “ringing.” Surge current may appear during turn-on of equipment, for example. Failure rate under current-surge conditions may not be predictable from conventional life test data.

Capacitors are capable of withstanding a 4 ±1 second charge of rated voltage (±2%) through a total circuit resistance (excluding the capacitor) of 1 ±0.2 ohms at +25°C, followed by a 4 ±1 second discharge to a voltage below 1% of the rated voltage. This cycle is repeated consecutively three (3) times. Post test performance:

- a. Capacitance — within ±5% of initial value
- b. DC Leakage — within initial limit
- c. Dissipation Factor — within initial limit

100% production surge current testing is performed on all Tantalum Chip series for case sizes C, D, E, X, U, V. The total test circuit resistance is ≤ 0.5 ohms. The applied voltage is 75% of rated voltage for all series except the T495 and T510 which are surged at 100% of rated voltage. Four surge cycles are applied. Parts not capable of surviving this test are removed at subsequent electrical screening. See T493 Series on page 22 for specific surge options.

**21. Storage Life Test**

- **2,000 hours, +125°C, Unbiased, Mounted**

Post Test Performance:

- a. Capacitance — within ±10% of initial value
- b. DC Leakage — within initial limit
- c. Dissipation Factor — within initial limit
- d. ESR — within initial limit
- e. Physical — no degradation of function

**22. Standard Life Test**

- **2,000 hours, +85°C, Rated Voltage, Mounted**

Post Test Performance:

- a. Capacitance — within ±10% of initial value
- b. DC Leakage — within 125% of initial limit
- c. Dissipation Factor — within initial limit
- d. ESR — within initial limit
- e. Physical — no degradation of function

**23. High Temperature Life Test**

- **2,000 hours, +125°C, 2/3 Rated Voltage, Mounted**

Post Test Performance:

- a. Capacitance — within ±10% of initial value
- b. DC Leakage — within 125% of initial limit
- c. Dissipation Factor — within initial limit
- d. ESR — within initial limit
- e. Physical — no degradation of function

**MECHANICAL**

**24. Resistance to Solvents**

- **Mil-Std-202, Method 215**

Post Test Performance:

- a. Capacitance — within ±10% of initial value
- b. DC Leakage — within initial limit
- c. Dissipation Factor — within initial limit
- d. Physical — no degradation of case, terminals or marking.

**25. Fungus**

- **Mil-Std-810, Method 508**

**26. Flammability**

- **UL94 VO Classification**

Encapsulant materials meet this classification.

**27. Resistance to Soldering Heat**

- **Wave Solder**  
**+260 ±5°C, 10 Seconds**
- **Infrared Reflow**  
**+230 ±5°C, 30 Seconds**
- **Vapor Phase Reflow**  
**+215 ±5°C, 2 minutes**

Post Test Performance:

- a. Capacitance — within ±10% of Initial Value
- b. DC Leakage — within Initial Limit
- c. Dissipation Factor — within Initial Limit

**28. Solderability**

- **Mil-Std-202, Method 208**
- **ANSI/J-STD-002, Test B**

Applies to Solder and Tin Coated terminations only. Does not apply to optional gold-plated terminations.

**29. Vibration**

- **Mil-Std-202, Method 204, Condition D, 10 Hz to 2,000 Hz, 20G Peak**

Post Test Performance:

- a. Capacitance — within ± 10% of initial value
- b. DC Leakage — within initial limit
- c. Dissipation Factor — within initial limit

**30. Shock**

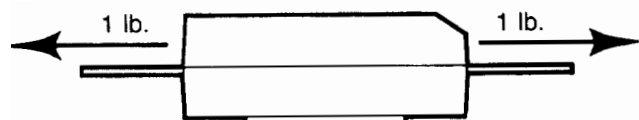
- **Mil-Std-202, Method 213, Condition I, 100 G Peak**

Post Test Performance:

- a. Capacitance — within ±10% of initial value
- b. DC Leakage — within initial limit
- c. Dissipation Factor — within initial limit

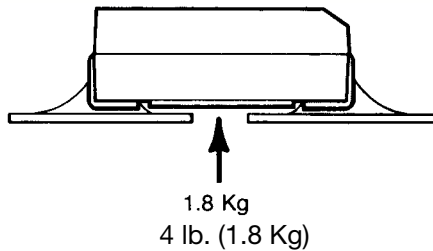
**31. Terminal Strength**

- **Pull Force**  
• **One Pound (454 grams), 30 Seconds**



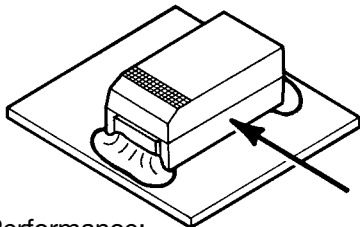
## TANTALUM MnO<sub>2</sub> COMPONENT PERFORMANCE CHARACTERISTICS (con't.)

- **Tensile Force**
- **Four Pounds (1.8 kilograms), 60 Seconds**



- **Shear Force**
- Table 8 Maximum Shear Loads**

| Case Code |         | Maximum Shear Loads |        |
|-----------|---------|---------------------|--------|
| KEMET     | EIA     | Kilograms           | Pounds |
| R         | 2012-12 | 2.4                 | 5.3    |
| S         | 3216-12 | 3.2                 | 7.0    |
| T         | 3528-12 | 3.6                 | 8.0    |
| U         | 6032-15 | 4.5                 | 10.0   |
| V         | 7343-20 | 5.0                 | 11.0   |
| A         | 3216-18 | 3.2                 | 7.0    |
| B         | 3528-21 | 3.6                 | 8.0    |
| C         | 6032-28 | 4.5                 | 10.0   |
| D         | 7343-31 | 5.0                 | 11.0   |
| X         | 7343-43 | 5.0                 | 11.0   |
| E         | 7260-38 | 5.0                 | 11.0   |



Post Test Performance:

- a. Capacitance — within  $\pm 5\%$  of initial value
- b. DC Leakage — within initial limit
- c. Dissipation Factor — within initial limit

## APPLICATIONS

### 32. Handling

Automatic handling of encapsulated components is enhanced by the molded case which provides compatibility with all types of high speed pick and place equipment. Manual handling of these devices presents no unique problems. Care should be taken with your fingers, however, to avoid touching the solder-coated terminations as body oils, acids and salts will degrade the solderability of these terminations. Finger cots should be used whenever manually handling all solderable surfaces.

### 33. Termination Coating

KEMET's standard termination finish is 100% Sn (Excluding the T492/3 series. Refer to specific lead frame options available on T493 Series). Standard terminations can be ordered with a "T" suffix in the lead material designator of the KEMET part number. Components ordered with the "T" suffix are Pb-Free/RoHS compliant and are backward and forward compatible with SnPb

and Pb-Free soldering processes.

90Sn/10Pb terminations are also available and can be ordered with an "H" suffix.

KEMET's "S" suffix remains an active termination designator for current designs but is not recommended for new designs. Parts ordered with an "S" suffix are not guaranteed to be Pb-Free or RoHS compliant. Refer to [www.kemet.com](http://www.kemet.com) for information on Pb-Free transition.

For conductive adhesive attachment processes, a gold termination finish is available for most series and case sizes. Refer to the specific series for details.

### 34. Recommended Mounting Pad Geometries

Proper mounting pad geometries are essential for successful solder connections. These dimensions are highly process sensitive and should be designed to maximize the integrity of the solder joint, and to minimize component rework due to unacceptable solder joints.

Figure 12 illustrates pad geometry. Tables 9 & 10 provide recommended pad dimensions for both wave and reflow soldering techniques. These dimensions are intended to be a starting point for circuit board designers, to be fine tuned, if necessary, based upon the peculiarities of the soldering process and/or circuit board design.

Contact KEMET for Engineering Bulletin Number F-2100 entitled "Surface Mount Mounting Pad Dimensions and Considerations" for further details on this subject.

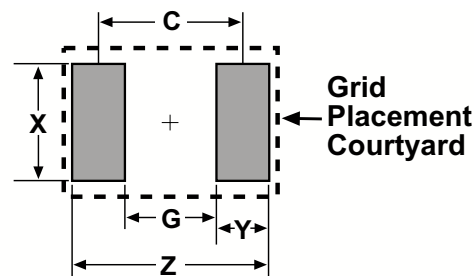


Figure 12

**Table 9 – Land Pattern Dimensions for Reflow Solder**

| KEMET/EIA Size Code             | Pad Dimensions - mm |      |      |         |         |
|---------------------------------|---------------------|------|------|---------|---------|
|                                 | Z                   | G    | X    | Y (ref) | C (ref) |
| R/2012-12                       | 3.90                | 0.80 | 1.80 | 1.55    | 2.35    |
| A/3216-18, S/3216-12            | 4.70                | 0.80 | 1.50 | 1.95    | 2.75    |
| B/3528-21, T/3528-12            | 5.00                | 1.10 | 2.50 | 1.95    | 3.05    |
| C/6032-28, U/6032-15            | 7.60                | 2.50 | 2.50 | 2.55    | 5.05    |
| D/7343-31, V/7343-20, X/7343-43 | 8.90                | 3.80 | 2.70 | 2.55    | 6.35    |
| E/7260-38                       | 8.90                | 3.80 | 4.40 | 2.55    | 6.35    |

**Table 10 – Land Pattern Dimensions for Wave Solder**

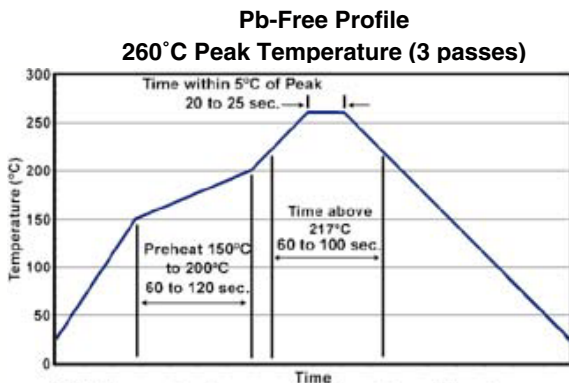
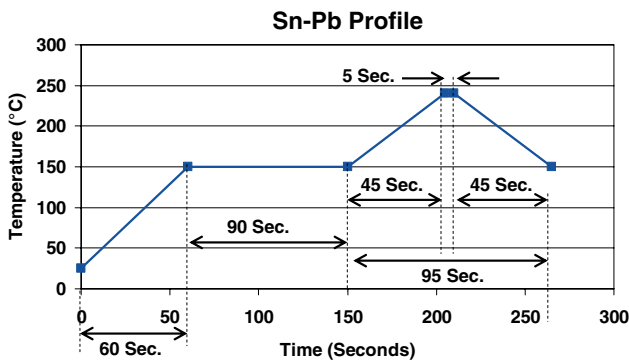
| KEMET/EIA Size Code             | Pad Dimensions - mm |      |      |         |         |
|---------------------------------|---------------------|------|------|---------|---------|
|                                 | Z                   | G    | X    | Y (ref) | C (ref) |
| R/2012-12                       | 4.30                | 0.80 | 1.26 | 1.75    | 2.55    |
| A/3216-18, S/3216-12            | 5.10                | 0.80 | 1.10 | 2.15    | 2.95    |
| B/3528-21, T/3528-12            | 5.40                | 1.10 | 1.80 | 2.15    | 3.25    |
| C/6032-28, U/6032-15            | 8.00                | 2.50 | 1.80 | 2.75    | 5.25    |
| D/7343-31, V/7343-20, X/7343-43 | 9.70                | 3.80 | 2.70 | 2.95    | 6.75    |
| E/7260-38                       | 9.70                | 3.80 | 4.40 | 2.95    | 6.75    |

**TANTALUM MnO<sub>2</sub> COMPONENT PERFORMANCE CHARACTERISTICS (con't.)**

**35. Soldering**

KEMET's families of surface mount tantalum capacitors are compatible with wave (single or dual) soldering and IR or vapor phase reflow techniques. Solder-coated terminations have excellent wetting characteristics for high integrity solder fillets. Preheating of these components is recommended to avoid extreme thermal stress. Figure 13 represents recommended maximum solder temperature / time combinations for these devices.

Note that although the X/7343-43 case size can withstand wave soldering, the tall profile (4.3mm maximum) dictates care in wave process development.



NOTE: Temperature is measured on the surface of the part  
**FIGURE 13 Time/Temperature Soldering Profile**

Hand-soldering should be performed with care due to the difficulty in process control. If performed, care should be taken to avoid contact of the soldering iron to the molded case. The iron should be used to heat the solder pad, applying solder between the pad and the termination, until reflow occurs. The iron should be removed. "Wiping" the edges of a chip and heating the top surface is not recommended.

During typical reflow operations a slight darkening of the gold-colored epoxy may be observed. This slight darkening is normal and is not harmful to the product. Marking permanency is not affected by this change.

**36. Washing**

Standard washing techniques and solvents are compatible with all KEMET surface mount tantalum capacitors. Solvents such as Freon TMC and TMS, Trichlorethane, methylene chloride, prelete, and isopropyl alcohol are not harmful to these components.

If ultrasonic agitation is utilized in the cleaning process, care should be taken to minimize energy levels and exposure times to avoid damage to the terminations.

KEMET tantalum chips are also compatible with newer aqueous and semi-aqueous processes. Please follow the recommendations for cleaning as defined by the solder vendor.

**37. Encapsulations**

Under normal circumstances, potting or encapsulation of KEMET tantalum chips is not required.

**38. Storage Environment**

Tantalum chip capacitors should be stored in normal working environments. While the chips themselves are quite robust in other environments, solderability will be degraded by exposure to high temperatures, high humidity, corrosive atmospheres, and long term storage. In addition, packaging materials will be degraded by high temperature – reels may soften or warp, and tape peel force may increase. KEMET recommends that maximum storage temperature not exceed 40 degrees C, and maximum storage humidity not exceed 60% relative humidity. In addition, temperature fluctuations should be minimized to avoid condensation on the parts, and atmospheres should be free of chlorine and sulfur bearing compounds. For optimized solderability, chip stock should be used promptly, preferably within 3 years of receipt.

**39. Component Weights**

- T49x, T510 Series

| Series | Case Size | Typical Weight (mg) |
|--------|-----------|---------------------|
| T49x   | A/3216-18 | 32                  |
| T49x   | B/3528-21 | 60                  |
| T49x   | C/6032-28 | 130                 |
| T49x   | D/7343-31 | 320                 |
| T49x   | X/7343-43 | 500                 |
| T49x   | E/7360-38 | 600                 |
| T49x   | R/2012-12 | 10                  |
| T49x   | S/3216-12 | 21                  |
| T49x   | T/3528-12 | 34                  |
| T49x   | U/6032-15 | 70                  |
| T49x   | V/7343-20 | 206                 |
| T510   | D/7343-31 | 338                 |
| T510   | X/7343-43 | 510                 |
| T510   | E/7360-38 | 645                 |

# SOLID TANTALUM CHIP CAPACITORS

## T491 SERIES - Precision Molded Chip

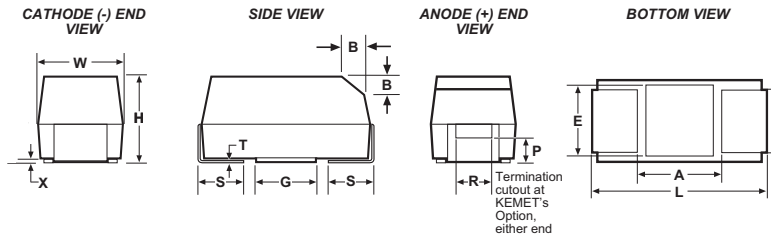


Solid Tantalum Surface Mount

### FEATURES

- Meets or Exceeds EIA Standard 535BAAC
- Taped and Reeled per EIA 481-1
- Symmetrical, Compliant Terminations
- Optional Gold-plated Terminations
- Laser-marked Case
- 100% Surge current test on C, D, E, U, V, X sizes
- Halogen Free Epoxy
- Capacitance: 0.1  $\mu$ F to 1000  $\mu$ F
- Tolerance:  $\pm 10\%$ ,  $\pm 20\%$
- Voltage: 2.5-50 VDC
- Extended Range Values
- Low Profile Case Sizes
- RoHS Compliance & Lead Free Terminations (See www.kemet.com for transition information)
- Operating Temperature: -55°C to +125°C

### CAPACITOR OUTLINE DRAWING



### STANDARD T491 DIMENSIONS

Millimeters (inches)

| Case Size |         | Component                        |                                  |                                  |                         |                         |                               |                                    |            |            |             |            |            |            |
|-----------|---------|----------------------------------|----------------------------------|----------------------------------|-------------------------|-------------------------|-------------------------------|------------------------------------|------------|------------|-------------|------------|------------|------------|
| KEMET     | EIA     | L*                               | W*                               | H*                               | F* $\pm 0.1 \pm (.004)$ | S* $\pm 0.3 \pm (.012)$ | B $\pm 0.15$ (Ref) $\pm .006$ | X (Ref)                            | P (Ref)    | R (Ref)    | T (Ref)     | A (Min)    | G (Ref)    | E (Ref)    |
| A         | 3216-18 | 3.2 $\pm 0.2$ (.126 $\pm .008$ ) | 1.6 $\pm 0.2$ (.063 $\pm .008$ ) | 1.6 $\pm 0.2$ (.063 $\pm .008$ ) | 1.2 (.047)              | 0.8 (.031)              | 0.4 (.016)                    | 0.10 $\pm 0.10$ (.004 $\pm .004$ ) | 0.4 (.016) | 0.4 (.016) | 0.13 (.005) | 1.4 (.055) | 1.1 (.043) | 1.3 (.051) |
| B         | 3528-21 | 3.5 $\pm 0.2$ (.138 $\pm .008$ ) | 2.8 $\pm 0.2$ (.110 $\pm .008$ ) | 1.9 $\pm 0.2$ (.075 $\pm .008$ ) | 2.2 (.087)              | 0.8 (.031)              | 0.4 (.016)                    | 0.10 $\pm 0.10$ (.004 $\pm .004$ ) | 0.5 (.020) | 1.0 (.039) | 0.13 (.005) | 1.1 (.043) | 1.8 (.071) | 2.2 (.087) |
| C         | 6032-28 | 6.0 $\pm 0.3$ (.236 $\pm .012$ ) | 3.2 $\pm 0.3$ (.126 $\pm .012$ ) | 2.5 $\pm 0.3$ (.098 $\pm .012$ ) | 2.2 (.087)              | 1.3 (.051)              | 0.5 (.020)                    | 0.10 $\pm 0.10$ (.004 $\pm .004$ ) | 0.9 (.035) | 1.0 (.039) | 0.13 (.005) | 3.1 (.122) | 2.8 (.110) | 2.4 (.094) |
| D         | 7343-31 | 7.3 $\pm 0.3$ (.287 $\pm .012$ ) | 4.3 $\pm 0.3$ (.169 $\pm .012$ ) | 2.8 $\pm 0.3$ (.110 $\pm .012$ ) | 2.4 (.094)              | 1.3 (.051)              | 0.5 (.020)                    | 0.10 $\pm 0.10$ (.004 $\pm .004$ ) | 0.9 (.035) | 1.0 (.039) | 0.13 (.005) | 3.8 (.150) | 3.5 (.138) | 3.5 (.138) |
| X         | 7343-43 | 7.3 $\pm 0.3$ (.287 $\pm .012$ ) | 4.3 $\pm 0.3$ (.169 $\pm .012$ ) | 4.0 $\pm 0.3$ (.157 $\pm .012$ ) | 2.4 (.094)              | 1.3 (.051)              | 0.5 (.020)                    | 0.10 $\pm 0.10$ (.004 $\pm .004$ ) | 1.7 (.067) | 1.0 (.039) | 0.13 (.005) | 3.8 (.150) | 3.5 (.138) | 3.5 (.138) |
| E         | 7260-38 | 7.3 $\pm 0.3$ (.287 $\pm .012$ ) | 6.0 $\pm 0.3$ (.236 $\pm .012$ ) | 3.6 $\pm 0.2$ (.142 $\pm .008$ ) | 4.1 (.161)              | 1.3 (.051)              | 0.5 (.020)                    | 0.10 $\pm 0.10$ (.004 $\pm .004$ ) | 0.9 (.035) | 1.0 (.039) | 0.13 (.005) | 3.8 (.150) | 3.5 (.138) | 3.5 (.138) |

Notes: 1. Metric dimensions govern  
 2. (Ref) Dimensions provided for reference only  
 \* Mil-PRF-55365/8 Specified Dimensions

### LOW PROFILE T491 DIMENSIONS

Millimeters (inches)

| Case Size |         | Component                        |                                  |            |                         |                         |             |             |            |            |            |  |
|-----------|---------|----------------------------------|----------------------------------|------------|-------------------------|-------------------------|-------------|-------------|------------|------------|------------|--|
| KEMET     | EIA     | L*                               | W*                               | H max      | F* $\pm 0.1 \pm (.004)$ | S* $\pm 0.3 \pm (.012)$ | X (Ref)     | T (Ref)     | A (Min)    | G (Ref)    | E (Ref)    |  |
| R         | 2012-12 | 2.0 $\pm 0.2$ (.079 $\pm .008$ ) | 1.3 $\pm 0.2$ (.051 $\pm .008$ ) | 1.2 (.047) | 0.9 (.035)              | 0.5 (.020)              | 0.05 (.002) | 0.13 (.005) | 0.8 (.031) | 0.5 (.020) | 0.8 (.031) |  |
| S         | 3216-12 | 3.2 $\pm 0.2$ (.126 $\pm .008$ ) | 1.6 $\pm 0.2$ (.063 $\pm .008$ ) | 1.2 (.047) | 1.2 (.047)              | 0.8 (.031)              | 0.05 (.002) | 0.13 (.005) | 1.4 (.055) | 1.1 (.043) | 1.3 (.051) |  |
| T         | 3528-12 | 3.5 $\pm 0.2$ (.138 $\pm .008$ ) | 2.8 $\pm 0.2$ (.110 $\pm .008$ ) | 1.2 (.047) | 2.2 (.087)              | 0.8 (.031)              | 0.05 (.002) | 0.13 (.005) | 1.1 (.043) | 1.8 (.071) | 2.2 (.087) |  |
| U         | 6032-15 | 6.0 $\pm 0.3$ (.236 $\pm .012$ ) | 3.2 $\pm 0.3$ (.126 $\pm .012$ ) | 1.5 (.059) | 2.2 (.087)              | 1.3 (.051)              | 0.05 (.002) | 0.13 (.005) | 3.1 (.122) | 2.8 (.110) | 2.4 (.094) |  |
| V         | 7343-20 | 7.3 $\pm 0.3$ (.287 $\pm .012$ ) | 4.3 $\pm 0.3$ (.169 $\pm .012$ ) | 2.0 (.079) | 2.4 (.094)              | 1.3 (.051)              | 0.05 (.002) | 0.13 (.005) | 3.8 (.150) | 3.5 (.138) | 3.5 (.138) |  |

Notes: 1. Metric dimensions govern  
 2. (Ref) Dimensions provided for reference only  
 3. No dimensions provided for B,P or R because low profile cases do not have a bevel or a notch.

### T491 ORDERING INFORMATION

**T 491 S 685 K 004 A T**

Tantalum \_\_\_\_\_  
 Series \_\_\_\_\_  
 491 - Industrial

Case Size \_\_\_\_\_  
 A,B,C,D,E,R,S,T,U,V,X

Capacitance Picofarad Code \_\_\_\_\_  
 First two digits represent significant figures. Third digit specifies number of zeros.

Lead Material  
 T = 100% Matte Tin (Sn) Plated\*  
 H = Standard Solder Coated (SnPb 5% Pb minimum)  
 G = Gold Plated (A,B,C,D,X only)

Failure Rate  
 A = Not Applicable

Voltage  
 As Shown

Capacitance Tolerance  
 M =  $\pm 20\%$   
 K =  $\pm 10\%$

\*Part number example: T491B105M035AT (14 digits - no spaces). See www.kemet.com for Pb Free transition.  
 \*\* "S" Termination codes are converting from 90Sn/10 Pb to 100% tin finishes. Orders including "S" suffix termination codes do not guarantee Pb-free product.

### T491 TANTALUM CHIP CAPACITANCE VALUES

#### Case Size by Capacitance and Voltage

| Capacitance |      | Rated Voltage @ +85°C |   |                |                |                  |              |         |       |       |       |
|-------------|------|-----------------------|---|----------------|----------------|------------------|--------------|---------|-------|-------|-------|
| μF          | Code | 2.5                   | 3 | 4              | 6              | 10               | 16           | 20      | 25    | 35    | 50    |
| 0.10        | 104  |                       |   |                |                |                  |              |         |       | A     | A     |
| 0.15        | 154  |                       |   |                |                |                  |              |         |       | A     | A/B   |
| 0.22        | 224  |                       |   |                |                |                  |              |         |       | A     | B     |
| 0.33        | 334  |                       |   |                |                |                  |              |         | A     | A     | B     |
| 0.47        | 474  |                       |   |                |                |                  |              |         | A     | A/B   | B/C   |
| 0.68        | 684  |                       |   |                |                |                  |              | A       | A     | A/B   | B/C   |
| 1.0         | 105  |                       |   |                |                |                  | A            | R/S/A   | A/B   | A/B   | V/B/C |
| 1.5         | 155  |                       |   |                |                | A                | A            | S/A     | R/A/B | B/C   | C/D   |
| 2.2         | 225  |                       |   |                | R/A            | A/B              | R/S/A        | R/A/B   | B/C   | B/C   | C/D   |
| 3.3         | 335  |                       |   | A              | A              | R/S/A            | A/B          | T/A/B   | B/C   | B/C   | D     |
| 4.7         | 475  |                       |   | A              | S/A            | A/B<br>R/S       | A/B/T        | A/B/C   | A/B/C | B/C/D | D     |
| 6.8         | 685  |                       |   | S/A            | R/S<br>A/B     | S/T<br>A/B       | A/B/C        | U/A/B/C | B/C   | C/D   | D/X   |
| 10.0        | 106  |                       |   | R/S<br>A/B     | R/S/T<br>A/B   | S/T/A<br>B/C     | B/C/U<br>T/A | U/B/C   | B/C/D | V/C/D | D/X   |
| 15.0        | 156  |                       |   | S/T<br>A/B     | S/T<br>A/B/C   | T/U<br>A/B/C     | U/A/B/C      | C/D     | C/D   | C/D/X | X     |
| 22.0        | 226  |                       |   | S/T<br>A/B/C   | U/T<br>A/B/C   | T/U<br>A/B/C     | U/B<br>C/D   | V/C/D   | V/C/D | D/X   |       |
| 33.0        | 336  |                       | A | T/U<br>A/B/C   | T/U<br>A/B/C   | U/V/A<br>T/B/C/D | U/C/D        | V/C/D   | D/X   | X     |       |
| 47.0        | 476  |                       |   | T/U<br>A/B/C   | T/U/A<br>B/C/D | U/V<br>B/C/D     | V/C/D        | D       | D/X   | X/E   |       |
| 68.0        | 686  |                       |   | U/A<br>B/C/D   | U/B<br>C/D     | U/V<br>B/C/D     | V/C/D        | D/X     | D/X   |       |       |
| 100.0       | 107  | T                     |   | T/U/A<br>B/C/D | U/V<br>B/C/D   | V/C/D            | V/D/X        | D/X/E   |       |       |       |
| 150.0       | 157  |                       |   | V/B<br>C/D     | V/C/D          | V/C<br>D/X       | D/X          |         |       |       |       |
| 220.0       | 227  |                       |   | V/B            | V/C<br>D/X     | V/D/X            | X            |         |       |       |       |
| 330.0       | 337  |                       |   | V/C/D          | D/X            | D/X/E            |              |         |       |       |       |
| 470.0       | 477  |                       |   | D/X            | D/X/E          | X/E              |              |         |       |       |       |
| 680.0       | 687  |                       |   | D/X            | E              |                  |              |         |       |       |       |
| 1000.0      | 108  |                       |   | X/E            |                |                  |              |         |       |       |       |

### T491 RATINGS & PART NUMBER REFERENCE

Solid Tantalum Surface Mount

| Capacitance<br>µF   | Case<br>Size | KEMET<br>Part Number | DC<br>Leakage<br>µA @ 25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | ESR Ω<br>@ +25°C<br>100 kHz<br>Max |
|---|--------------|----------------------|-----------------------------------|----------------------------------|------------------------------------|
| <b>2.5 Volt Rating at +85°C (1.7 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 100.0   | T            | T491T107(1)2R5A(2)   | 2.5                               | 24.0                             | 3.9                                |
| 220.0   | D            | T491D227(1)2R5A(2)   | 5.5                               | 8.0                              | 0.3                                |
| <b>3 Volt Rating at +85°C (2 Volt Rating at +125°C)</b>     |              |                      |                                   |                                  |                                    |
| #33.0   | A            | T491A336(1)003A(2)   | 1.0                               | 6.0                              | 4.0                                |
| <b>4 Volt Rating at +85°C (2.7 Volt Rating at +125°C)</b>   |              |                      |                                   |                                  |                                    |
| 3.3   | A            | T491A335(1)004A(2)   | 0.5                               | 6.0                              | 8.0                                |
| 4.7   | A            | T491A475(1)004A(2)   | 0.5                               | 6.0                              | 8.0                                |
| 6.8   | A            | T491A685(1)004A(2)   | 0.5                               | 6.0                              | 6.0                                |
| 6.8   | S            | T491S685(1)004A(2)   | 0.5                               | 6.0                              | 15.0                               |
| 10.0  | B            | T491B106(1)004A(2)   | 0.5                               | 6.0                              | 3.5                                |
| 10.0  | A            | T491A106(1)004A(2)   | 0.5                               | 6.0                              | 6.0                                |
| #10.0   | S            | T491S106(1)004A(2)   | 0.5                               | 6.0                              | 15.0                               |
| #10.0   | R            | T491R106(1)004A(2)   | 0.5                               | 8.0                              | 10.0                               |
| 15.0  | B            | T491B156(1)004A(2)   | 0.6                               | 6.0                              | 3.5                                |
| 15.0  | A            | T491A156(1)004A(2)   | 0.6                               | 6.0                              | 4.0                                |
| 15.0  | T            | T491T156(1)004A(2)   | 0.6                               | 6.0                              | 5.0                                |
| #15.0   | S            | T491S156(1)004A(2)   | 0.6                               | 10.0                             | 15.0                               |
| 22.0  | C            | T491C226(1)004A(2)   | 0.9                               | 6.0                              | 1.8                                |
| 22.0  | B            | T491B226(1)004A(2)   | 0.9                               | 6.0                              | 3.5                                |
| #22.0   | A            | T491A226(1)004A(2)   | 0.9                               | 6.0                              | 4.0                                |
| #22.0   | T            | T491T226(1)004A(2)   | 0.9                               | 6.0                              | 5.0                                |
| 22.0  | S            | T491S226(1)004A(2)   | 0.9                               | 10.0                             | 10.0                               |
| 33.0  | C            | T491C336(1)004A(2)   | 1.3                               | 6.0                              | 1.8                                |
| 33.0  | U            | T491U336(1)004A(2)   | 1.3                               | 6.0                              | 1.8                                |
| 33.0  | B            | T491B336(1)004A(2)   | 1.3                               | 6.0                              | 3.5                                |
| #33.0   | A            | T491A336(1)004A(2)   | 1.3                               | 6.0                              | 4.0                                |
| #33.0   | T            | T491T336(1)004A(2)   | 1.3                               | 8.0                              | 5.0                                |
| 47.0  | C            | T491C476(1)004A(2)   | 1.9                               | 6.0                              | 1.8                                |
| 47.0  | U            | T491U476(1)004A(2)   | 1.9                               | 6.0                              | 1.8                                |
| #47.0   | B            | T491B476(1)004A(2)   | 1.9                               | 6.0                              | 3.0                                |
| #47.0   | A            | T491A476M004A(2)     | 1.9                               | 12.0                             | 2.5                                |
| #47.0   | T            | T491T476M004A(2)     | 1.9                               | 12.0                             | 6.0                                |
| 68.0  | D            | T491D686(1)004A(2)   | 2.7                               | 6.0                              | 0.8                                |
| 68.0  | C            | T491C686(1)004A(2)   | 2.7                               | 6.0                              | 1.6                                |
| #68.0   | U            | T491U686(1)004A(2)   | 2.7                               | 6.0                              | 1.8                                |
| #68.0   | B            | T491B686(1)004A(2)   | 2.7                               | 6.0                              | 3.5                                |
| #68.0   | A            | T491A686(1)004A(2)   | 2.8                               | 30.0                             | 4.0                                |
| 100.0   | D            | T491D107(1)004A(2)   | 4.0                               | 8.0                              | 0.8                                |
| #100.0  | C            | T491C107(1)004A(2)   | 4.0                               | 8.0                              | 1.2                                |
| #100.0  | U            | T491U107(1)004A(2)   | 4.0                               | 10.0                             | 1.8                                |
| #100.0  | B            | T491B107M004A(2)     | 4.0                               | 8.0                              | 0.9                                |
| †100.0  | A            | T491A107M004A(2)     | 4.0                               | 30.0                             | 4.0                                |
| †100.0  | T            | T491T107M004A(2)     | 4.0                               | 30.0                             | 5.0                                |
| 150.0   | D            | T491D157(1)004A(2)   | 6.0                               | 8.0                              | 0.8                                |
| 150.0   | V            | T491V157(1)004A(2)   | 6.0                               | 8.0                              | 0.7                                |
| #150.0  | C            | T491C157(1)004A(2)   | 6.0                               | 8.0                              | 1.2                                |
| †150.0  | B            | T491B157M004A(2)     | 6.0                               | 12.0                             | 2.0                                |
| #220.0  | V            | T491V227(1)004A(2)   | 8.8                               | 8.0                              | 0.7                                |
| #220.0  | B            | T491B227M004A(2)     | 8.8                               | 18.0                             | 0.5                                |
| 330.0   | D            | T491D337(1)004A(2)   | 13.2                              | 8.0                              | 0.7                                |
| †330.0  | V            | T491V337(1)004A(2)   | 13.2                              | 12.0                             | 0.7                                |
| #330.0  | C            | T491C337(1)004A(2)   | 13.2                              | 10.0                             | 0.9                                |
| #470.0  | X            | T491X477(1)004A(2)   | 18.8                              | 8.0                              | 0.5                                |
| #470.0  | D            | T491D477(1)004A(2)   | 18.8                              | 8.0                              | 0.8                                |
| #680.0  | X            | T491X687(1)004A(2)   | 27.2                              | 12.0                             | 0.5                                |
| #680.0  | D            | T491D687(1)004A(2)   | 27.2                              | 12.0                             | 0.5                                |
| #1000.0   | X            | T491X108(1)004A(2)   | 40.0                              | 12.0                             | 0.5                                |
| #1000.0   | E            | T491E108M004A(2)     | 40.0                              | 15.0                             | 0.2                                |
| <b>**6.3 Volt Rating at +85°C (4 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 2.2   | R            | T491R225(1)006A(2)   | 0.5                               | 6.0                              | 25.0                               |
| 2.2   | A            | T491A225(1)006A(2)   | 0.5                               | 6.0                              | 8.0                                |
| 3.3   | A            | T491A335(1)006A(2)   | 0.5                               | 6.0                              | 8.0                                |
| 4.7   | A            | T491A475(1)006A(2)   | 0.5                               | 6.0                              | 6.0                                |
| 4.7   | S            | T491S475(1)006A(2)   | 0.5                               | 6.0                              | 15.0                               |
| 6.8   | B            | T491B685(1)006A(2)   | 0.5                               | 6.0                              | 3.5                                |
| 6.8   | A            | T491A685(1)006A(2)   | 0.5                               | 6.0                              | 6.0                                |
| #6.8  | S            | T491S685(1)006A(2)   | 0.5                               | 6.0                              | 15.0                               |
| #6.8  | R            | T491R685(1)006A(2)   | 0.5                               | 8.0                              | 15.0                               |
| 10.0  | B            | T491B106(1)006A(2)   | 0.6                               | 6.0                              | 3.5                                |
| 10.0  | A            | T491A106(1)006A(2)   | 0.6                               | 6.0                              | 4.0                                |
| 10.0  | T            | T491T106(1)006A(2)   | 0.6                               | 6.0                              | 5.0                                |
| #10.0   | S            | T491S106(1)006A(2)   | 0.6                               | 10.0                             | 15.0                               |
| #10.0   | R            | T491R106(1)006A(2)   | 0.6                               | 8.0                              | 10.0                               |

| Capacitance<br>µF   | Case<br>Size | KEMET<br>Part Number | DC<br>Leakage<br>µA @ 25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | ESR Ω<br>@ +25°C<br>100 kHz<br>Max |
|---|--------------|----------------------|-----------------------------------|----------------------------------|------------------------------------|
| <b>**6 Volt Rating at +85°C (4 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 15.0  | C            | T491C156(1)006A(2)   | 0.9                               | 6.0                              | 1.8                                |
| 15.0  | B            | T491B156(1)006A(2)   | 0.9                               | 6.0                              | 3.5                                |
| #15.0   | A            | T491A156(1)006A(2)   | 0.9                               | 6.0                              | 3.5                                |
| #15.0   | T            | T491T156(1)006A(2)   | 0.9                               | 6.0                              | 5.0                                |
| #15.0   | S            | T491S156(1)006A(2)   | 0.9                               | 15.0                             | 10.0                               |
| 22.0  | C            | T491C226(1)006A(2)   | 1.4                               | 6.0                              | 1.8                                |
| 22.0  | U            | T491U226(1)006A(2)   | 1.4                               | 6.0                              | 1.8                                |
| 22.0  | B            | T491B226(1)006A(2)   | 1.4                               | 6.0                              | 3.5                                |
| #22.0   | A            | T491A226(1)006A(2)   | 1.4                               | 6.0                              | 4.0                                |
| #22.0   | T            | T491T226(1)006A(2)   | 1.4                               | 8.0                              | 5.0                                |
| 33.0  | C            | T491C336(1)006A(2)   | 2.0                               | 6.0                              | 1.8                                |
| 33.0  | U            | T491U336(1)006A(2)   | 2.0                               | 6.0                              | 1.8                                |
| #33.0   | B            | T491B336(1)006A(2)   | 2.0                               | 6.0                              | 3.0                                |
| #33.0   | A            | T491A336(1)006A(2)   | 2.0                               | 12.0                             | 2.5                                |
| #33.0   | T            | T491T336(1)006A(2)   | 2.0                               | 12.0                             | 6.0                                |
| 47.0  | D            | T491D476(1)006A(2)   | 2.9                               | 6.0                              | 0.8                                |
| 47.0  | C            | T491C476(1)006A(2)   | 2.9                               | 6.0                              | 1.6                                |
| #47.0   | U            | T491U476(1)006A(2)   | 2.9                               | 6.0                              | 1.8                                |
| #47.0   | B            | T491B476(1)006A(2)   | 2.9                               | 6.0                              | 2.0                                |
| †47.0   | A            | T491A476M006A(2)     | 3.0                               | 12.0                             | 3.5                                |
| *47.0   | T            | T491T476(1)006A(2)   | 3.0                               | 24.0                             | 4.4                                |
| 68.0  | D            | T491D686(1)006A(2)   | 4.1                               | 6.0                              | 0.8                                |
| #68.0   | C            | T491C686(1)006A(2)   | 4.1                               | 6.0                              | 1.2                                |
| #68.0   | U            | T491U686(1)006A(2)   | 4.1                               | 10.0                             | 1.8                                |
| #68.0   | B            | T491B686(1)006A(2)   | 4.1                               | 8.0                              | 0.9                                |
| #68.0   | A            | T491A686(1)006A(2)   | 5.0                               | 30.0                             | 4.0                                |
| 100.0   | D            | T491D107(1)006A(2)   | 6.0                               | 8.0                              | 0.8                                |
| 100.0   | V            | T491V107(1)006A(2)   | 6.0                               | 8.0                              | 0.7                                |
| #100.0  | C            | T491C107(1)006A(2)   | 6.0                               | 8.0                              | 0.9                                |
| #100.0  | U            | T491U107(1)006A(2)   | 6.0                               | 10.0                             | 1.8                                |
| #100.0  | B            | T491B107(1)006A(2)   | 6.3                               | 15.0                             | 3.0                                |
| 150.0   | D            | T491D157(1)006A(2)   | 9.0                               | 8.0                              | 0.7                                |
| #150.0  | C            | T491C157(1)006A(2)   | 9.0                               | 8.0                              | 1.2                                |
| #150.0  | V            | T491V157(1)006A(2)   | 9.0                               | 8.0                              | 0.7                                |
| 220.0   | X            | T491X227(1)006A(2)   | 13.2                              | 8.0                              | 0.7                                |
| #220.0  | D            | T491D227(1)006A(2)   | 13.2                              | 8.0                              | 0.7                                |
| #220.0  | C            | T491C227M006A(2)     | 13.2                              | 10.0                             | 1.2                                |
| #220.0  | V            | T491V227(1)006A(2)   | 13.2                              | 12.0                             | 0.7                                |
| 330.0   | X            | T491X337(1)006A(2)   | 19.8                              | 8.0                              | 0.4                                |
| 330.0   | D            | T491D337(1)006A(2)   | 19.8                              | 8.0                              | 0.4                                |
| 330.0   | E            | T491E337(1)006A(2)   | 20.8                              | 8.0                              | 0.5                                |
| 470.0   | X            | T491X477(1)006A(2)   | 28.2                              | 10.0                             | 0.4                                |
| 470.0   | D            | T491D477M006A(2)     | 28.2                              | 12.0                             | 0.4                                |
| 470.0   | E            | T491E477(1)006A(2)   | 29.6                              | 10.0                             | 0.4                                |
| 680.0   | E            | T491E687M006A(2)     | 40.8                              | 12.0                             | 0.5                                |
| <b>10 Volt Rating at +85°C (7 Volt Rating at +125°C)</b>  |              |                      |                                   |                                  |                                    |
| 1.5   | A            | T491A155(1)010A(2)   | 0.5                               | 6.0                              | 8.0                                |
| 2.2   | B            | T491B225(1)010A(2)   | 0.5                               | 6.0                              | 3.5                                |
| 2.2   | A            | T491A225(1)010A(2)   | 0.5                               | 6.0                              | 8.0                                |
| 3.3   | A            | T491A335(1)010A(2)   | 0.5                               | 6.0                              | 6.0                                |
| 3.3   | S            | T491S335(1)010A(2)   | 0.5                               | 6.0                              | 15.0                               |
| #3.3  | R            | T491R335(1)010A(2)   | 0.3                               | 8.0                              | 15.0                               |
| 4.7   | B            | T491B475(1)010A(2)   | 0.5                               | 6.0                              | 3.5                                |
| 4.7   | A            | T491A475(1)010A(2)   | 0.5                               | 6.0                              | 5.0                                |
| #4.7  | S            | T491S475(1)010A(2)   | 0.5                               | 6.0                              | 15.0                               |
| #4.7  | R            | T491R475(1)010A(2)   | 0.5                               | 8.0                              | 10.0                               |
| 6.8   | B            | T491B685(1)010A(2)   | 0.7                               | 6.0                              | 3.5                                |
| 6.8   | A            | T491A685(1)010A(2)   | 0.7                               | 6.0                              | 4.0                                |
| 6.8   | T            | T491T685(1)010A(2)   | 0.7                               | 6.0                              | 5.0                                |
| #6.8  | S            | T491S685(1)010A(2)   | 0.7                               | 10.0                             | 15.0                               |
| 10.0  | C            | T491C106(1)010A(2)   | 1.0                               | 6.0                              | 1.8                                |
| 10.0  | B            | T491B106(1)010A(2)   | 1.0                               | 6.0                              | 3.5                                |
| #10.0   | A            | T491A106(1)010A(2)   | 1.0                               | 6.0                              | 4.0                                |
| #10.0   | T            | T491T106(1)010A(2)   | 1.0                               | 6.0                              | 5.0                                |
| #10.0   | S            | T491S106(1)010A(2)   | 1.0                               | 10.0                             | 15.0                               |
| #10.0   | R            | T491R106(1)010A(2)   | 1.0                               | 24.0                             | 30.0                               |
| 15.0  | C            | T491C156(1)010A(2)   | 1.5                               | 6.0                              | 1.8                                |
| 15.0  | U            | T491U156(1)010A(2)   | 1.5                               | 6.0                              | 1.8                                |
| 15.0  | B            | T491B156(1)010A(2)   | 1.5                               | 6.0                              | 2.8                                |
| #15.0   | A            | T491A156(1)010A(2)   | 1.5                               | 8.0                              | 6.0                                |
| #15.0   | T            | T491T156(1)010A(2)   | 1.5                               | 8.0                              | 5.0                                |

(1) To complete KEMET Part Number, insert M for ±20% tolerance or K for ±10% tolerance.  
 (2) To complete KEMET Part Number, insert T, H, G lead material designation as shown on page 15.

\*Extended Values

\*\*6 Volt product equivalent to 6.3 volt product.

#Maximum Capacitance Change @ 125°C=±15%.

†Maximum Capacitance Change @ 125°C=±20%.

Higher voltage ratings and tighter tolerance product may be substituted within the same size at KEMET's option.

Voltage substitutions will be marked with the higher voltage rating.

# SOLID TANTALUM CHIP CAPACITORS

## T491 SERIES—Precision Molded Chip

### T491 RATINGS & PART NUMBER REFERENCE

| Capacitance<br>µF   | Case<br>Size | KEMET<br>Part Number | DC<br>Leakage<br>µA @ 25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | ESR Ω<br>@ +25°C<br>100 kHz<br>Max |
|---|--------------|----------------------|-----------------------------------|----------------------------------|------------------------------------|
| <b>10 Volt Rating at +85°C (7 Volt Rating at +125°C)</b>  |              |                      |                                   |                                  |                                    |
| 22.0  | C            | T491C226(1)010A(2)   | 2.2                               | 6.0                              | 1.8                                |
| 22.0  | U            | T491U226(1)010A(2)   | 2.2                               | 6.0                              | 1.8                                |
| #22.0   | B            | T491B226(1)010A(2)   | 2.2                               | 6.0                              | 2.4                                |
| #22.0   | A            | T491A226M010A(2)     | 2.2                               | 10.0                             | 6.0                                |
| #22.0   | T            | T491T226(1)010A(2)   | 2.2                               | 12.0                             | 8.0                                |
| 33.0  | D            | T491D336(1)010A(2)   | 3.3                               | 6.0                              | 0.8                                |
| 33.0  | V            | T491V336(1)010A(2)   | 3.3                               | 6.0                              | 0.7                                |
| 33.0  | C            | T491C336(1)010A(2)   | 3.3                               | 6.0                              | 1.6                                |
| #33.0   | U            | T491U336(1)010A(2)   | 3.3                               | 6.0                              | 1.8                                |
| #33.0   | B            | T491B336(1)010A(2)   | 3.3                               | 6.0                              | 1.8                                |
| #33.0   | T            | T491T336(1)010A(2)   | 3.3                               | 24.0                             | 5.0                                |
| #33.0   | A            | T491A336(1)010A(2)   | 3.3                               | 15.0                             | 6.0                                |
| 47.0  | D            | T491D476(1)010A(2)   | 4.7                               | 6.0                              | 0.8                                |
| 47.0  | V            | T491V476(1)010A(2)   | 4.7                               | 6.0                              | 0.7                                |
| #47.0   | C            | T491C476(1)010A(2)   | 4.7                               | 6.0                              | 1.2                                |
| #47.0   | U            | T491U476(1)010A(2)   | 4.7                               | 10.0                             | 2.2                                |
| #47.0   | B            | T491B476(1)010A(2)   | 4.7                               | 8.0                              | 1.0                                |
| 68.0  | D            | T491D686(1)010A(2)   | 6.8                               | 6.0                              | 0.8                                |
| 68.0  | V            | T491V686(1)010A(2)   | 6.8                               | 6.0                              | 0.7                                |
| #68.0   | C            | T491C686(1)010A(2)   | 6.8                               | 6.0                              | 1.2                                |
| #68.0   | U            | T491U686(1)010A(2)   | 6.8                               | 10.0                             | 1.8                                |
| #68.0   | B            | T491B686M010A(2)     | 6.8                               | 10.0                             | 3.0                                |
| 100.0   | D            | T491D107(1)010A(2)   | 10.0                              | 8.0                              | 0.7                                |
| #100.0  | C            | T491C107(1)010A(2)   | 10.0                              | 8.0                              | 1.2                                |
| #100.0  | V            | T491V107(1)010A(2)   | 10.0                              | 8.0                              | 0.7                                |
| 150.0   | X            | T491X157(1)010A(2)   | 15.0                              | 8.0                              | 0.7                                |
| #150.0  | D            | T491D157(1)010A(2)   | 15.0                              | 8.0                              | 0.7                                |
| #150.0  | C            | T491C157(1)010A(2)   | 15.0                              | 10.0                             | 0.9                                |
| #150.0  | V            | T491V157(1)010A(2)   | 15.0                              | 8.0                              | 0.7                                |
| #220.0  | X            | T491X227(1)010A(2)   | 22.0                              | 8.0                              | 0.5                                |
| #220.0  | D            | T491D227(1)010A(2)   | 22.0                              | 8.0                              | 0.5                                |
| #330.0  | D            | T491D337M010A(2)     | 33.0                              | 10.0                             | 0.5                                |
| #330.0  | X            | T491X337(1)010A(2)   | 33.0                              | 10.0                             | 0.5                                |
| #330.0  | E            | T491E337(1)010A(2)   | 33.0                              | 10.0                             | 0.5                                |
| #470.0  | X            | T491X477M010A(2)     | 47.0                              | 10.0                             | 0.2                                |
| #470.0  | E            | T491E477M010A(2)     | 47.0                              | 12.0                             | 0.5                                |
| <b>16 Volt Rating at +85°C (10 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 1.0   | A            | T491A105(1)016A(2)   | 0.5                               | 4.0                              | 10.0                               |
| 1.5   | A            | T491A155(1)016A(2)   | 0.5                               | 6.0                              | 8.0                                |
| 2.2   | A            | T491A225(1)016A(2)   | 0.5                               | 6.0                              | 6.0                                |
| 2.2   | S            | T491S225(1)016A(2)   | 0.5                               | 6.0                              | 15.0                               |
| #2.2  | R            | T491R225(1)016A(2)   | 0.5                               | 8.0                              | 25.0                               |
| 3.3   | B            | T491B335(1)016A(2)   | 0.5                               | 6.0                              | 3.5                                |
| 3.3   | A            | T491A335(1)016A(2)   | 0.5                               | 6.0                              | 5.0                                |
| 4.7   | C            | T491C475(1)016A(2)   | 0.75                              | 6.0                              | 2.4                                |
| 4.7   | B            | T491B475(1)016A(2)   | 0.8                               | 6.0                              | 3.5                                |
| 4.7   | A            | T491A475(1)016A(2)   | 0.8                               | 6.0                              | 4.0                                |
| 4.7   | T            | T491T475(1)016A(2)   | 0.8                               | 6.0                              | 5.0                                |
| 6.8   | C            | T491C685(1)016A(2)   | 1.1                               | 6.0                              | 1.9                                |
| 6.8   | B            | T491B685(1)016A(2)   | 1.1                               | 6.0                              | 2.5                                |
| #6.8  | A            | T491A685(1)016A(2)   | 1.1                               | 6.0                              | 3.5                                |
| 10.0  | C            | T491C106(1)016A(2)   | 1.6                               | 6.0                              | 1.8                                |
| 10.0  | U            | T491U106(1)016A(2)   | 1.6                               | 6.0                              | 1.8                                |
| 10.0  | B            | T491B106(1)016A(2)   | 1.6                               | 6.0                              | 2.8                                |
| #10.0   | A            | T491A106(1)016A(2)   | 1.6                               | 8.0                              | 7.0                                |
| #10.0   | T            | T491T106(1)016A(2)   | 1.6                               | 8.0                              | 8.0                                |
| 15.0  | C            | T491C156(1)016A(2)   | 2.4                               | 6.0                              | 1.8                                |
| 15.0  | U            | T491U156(1)016A(2)   | 2.4                               | 6.0                              | 1.8                                |
| 15.0  | B            | T491B156(1)016A(2)   | 2.4                               | 6.0                              | 2.5                                |
| #15.0   | A            | T491A156(1)016A(2)   | 2.4                               | 8.0                              | 3.5                                |
| 22.0  | D            | T491D226(1)016A(2)   | 3.6                               | 6.0                              | 0.8                                |
| 22.0  | C            | T491C226(1)016A(2)   | 3.6                               | 6.0                              | 1.6                                |
| #22.0   | U            | T491U226(1)016A(2)   | 3.6                               | 10.0                             | 3.0                                |
| #22.0   | B            | T491B226(1)016A(2)   | 3.6                               | 6.0                              | 2.2                                |
| 33.0  | D            | T491D336(1)016A(2)   | 5.3                               | 6.0                              | 0.8                                |
| #33.0   | C            | T491C336(1)016A(2)   | 5.3                               | 6.0                              | 1.2                                |
| #33.0   | U            | T491U336(1)016A(2)   | 5.3                               | 12.0                             | 3.0                                |
| 47.0  | D            | T491D476(1)016A(2)   | 7.5                               | 6.0                              | 0.8                                |
| 47.0  | V            | T491V476(1)016A(2)   | 7.5                               | 6.0                              | 0.7                                |
| #47.0   | C            | T491C476(1)016A(2)   | 7.5                               | 6.0                              | 1.2                                |
| 68.0  | V            | T491V686(1)016A(2)   | 10.9                              | 6.0                              | 0.7                                |
| 68.0  | D            | T491D686(1)016A(2)   | 10.9                              | 6.0                              | 0.7                                |
| 68.0  | C            | T491C686(1)016A(2)   | 10.9                              | 12.0                             | 1.2                                |

| Capacitance<br>µF   | Case<br>Size | KEMET<br>Part Number | DC<br>Leakage<br>µA @ 25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | ESR Ω<br>@ +25°C<br>100 kHz<br>Max |
|---|--------------|----------------------|-----------------------------------|----------------------------------|------------------------------------|
| <b>16 Volt Rating at +85°C (10 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 100.0   | X            | T491X107(1)016A(2)   | 16.0                              | 8.0                              | 0.7                                |
| †100.0  | V            | T491V107(1)016A(2)   | 16.0                              | 12.0                             | 0.7                                |
| #100.0  | D            | T491D107(1)016A(2)   | 16.0                              | 8.0                              | 0.7                                |
| #150.0  | X            | T491X157(1)016A(2)   | 24.0                              | 8.0                              | 0.5                                |
| #150.0  | D            | T491D157(1)016A(2)   | 24.0                              | 12.0                             | 0.7                                |
| #220.0  | X            | T491X227(1)016A(2)   | 35.2                              | 10.0                             | 0.5                                |
| #220.0  | E            | T491E227(1)016A(2)   | 35.2                              | 7.2                              | 0.9                                |
| <b>20 Volt Rating at +85°C (13 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 0.47  | R            | T491R474(1)020A(2)   | 0.1                               | 4.0                              | 35.0                               |
| 0.68  | A            | T491A684(1)020A(2)   | 0.5                               | 4.0                              | 12.0                               |
| 1.0   | A            | T491A105(1)020A(2)   | 0.5                               | 4.0                              | 9.0                                |
| 1.0   | S            | T491S105(1)020A(2)   | 0.5                               | 6.0                              | 18.0                               |
| #1.0  | R            | T491R105(1)020A(2)   | 0.5                               | 6.0                              | 20.0                               |
| 1.5   | A            | T491A155(1)020A(2)   | 0.5                               | 6.0                              | 6.5                                |
| 1.5   | S            | T491S155(1)020A(2)   | 0.5                               | 6.0                              | 15.0                               |
| 2.2   | B            | T491B225(1)020A(2)   | 0.5                               | 6.0                              | 3.5                                |
| 2.2   | A            | T491A225(1)020A(2)   | 0.5                               | 6.0                              | 7.0                                |
| 2.2   | R            | T491R225(1)020A(2)   | 0.4                               | 8.0                              | 8.0                                |
| 3.3   | B            | T491B335(1)020A(2)   | 0.7                               | 6.0                              | 3.0                                |
| #3.3  | A            | T491A335(1)020A(2)   | 0.7                               | 6.0                              | 4.5                                |
| 3.3   | T            | T491T335(1)020A(2)   | 0.7                               | 6.0                              | 5.0                                |
| 4.7   | C            | T491C475(1)020A(2)   | 1.0                               | 6.0                              | 2.4                                |
| 4.7   | B            | T491B475(1)020A(2)   | 1.0                               | 6.0                              | 3.0                                |
| #4.7  | A            | T491A475(1)020A(2)   | 1.0                               | 6.0                              | 4.0                                |
| 6.8   | C            | T491C685(1)020A(2)   | 1.4                               | 6.0                              | 1.9                                |
| 6.8   | U            | T491U685(1)020A(2)   | 1.4                               | 6.0                              | 1.9                                |
| #6.8  | B            | T491B685(1)020A(2)   | 1.4                               | 6.0                              | 2.5                                |
| #6.8  | A            | T491A685M020A(2)     | 1.4                               | 8.0                              | 6.0                                |
| 10.0  | C            | T491C106(1)020A(2)   | 2.0                               | 6.0                              | 1.8                                |
| 10.0  | U            | T491U106(1)020A(2)   | 2.0                               | 6.0                              | 1.8                                |
| #10.0   | B            | T491B106(1)020A(2)   | 2.0                               | 6.0                              | 2.1                                |
| #10.0   | A            | T491A106M020A(2)     | 2.0                               | 10.0                             | 5.0                                |
| 15.0  | D            | T491D156(1)020A(2)   | 3.0                               | 6.0                              | 1.0                                |
| 15.0  | C            | T491C156(1)020A(2)   | 3.0                               | 6.0                              | 1.7                                |
| 22.0  | D            | T491D226(1)020A(2)   | 4.4                               | 6.0                              | 0.8                                |
| 22.0  | V            | T491V226(1)020A(2)   | 4.4                               | 6.0                              | 0.7                                |
| #22.0   | C            | T491C226(1)020A(2)   | 4.4                               | 6.0                              | 1.2                                |
| #22.0   | B            | T491B226(1)020A(2)   | 4.4                               | 8.0                              | 4.0                                |
| 33.0  | D            | T491D336(1)020A(2)   | 6.6                               | 6.0                              | 0.8                                |
| #33.0   | C            | T491C336M020A(2)     | 6.6                               | 6.0                              | 1.2                                |
| †33.0   | V            | T491V336(1)020A(2)   | 6.6                               | 8.0                              | 0.7                                |
| 47.0  | C            | T491C476M020A(2)     | 9.4                               | 10.0                             | 0.9                                |
| 47.0  | D            | T491D476(1)020A(2)   | 9.4                               | 6.0                              | 0.7                                |
| 68.0  | X            | T491X686(1)020A(2)   | 13.6                              | 6.0                              | 0.7                                |
| #68.0   | D            | T491D686(1)020A(2)   | 13.6                              | 8.0                              | 0.7                                |
| #100.0  | X            | T491X107(1)020A(2)   | 20.0                              | 8.0                              | 0.5                                |
| #100.0  | E            | T491E107(1)020A(2)   | 20.0                              | 8.0                              | 0.5                                |
| #150.0  | X            | T491X157(1)020A(2)   | 30.0                              | 10.0                             | 0.5                                |
| <b>25 Volt Rating at +85°C (17 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 0.33  | A            | T491A334(1)025A(2)   | 0.5                               | 4.0                              | 15.0                               |
| 0.47  | A            | T491A474(1)025A(2)   | 0.5                               | 4.0                              | 14.0                               |
| 0.68  | A            | T491A684(1)025A(2)   | 0.5                               | 4.0                              | 10.0                               |
| 1.0   | B            | T491B105(1)025A(2)   | 0.5                               | 4.0                              | 5.0                                |
| 1.0   | A            | T491A105(1)025A(2)   | 0.5                               | 4.0                              | 8.0                                |
| 1.0   | S            | T491S105(1)025A(2)   | 0.25                              | 6.0                              | 18.0                               |
| 1.5   | B            | T491B155(1)025A(2)   | 0.5                               | 6.0                              | 5.0                                |
| 1.5   | A            | T491A155(1)025A(2)   | 0.5                               | 6.0                              | 7.5                                |
| 1.5   | R            | T491R155(1)025A(2)   | 0.4                               | 8.0                              | 8.0                                |
| 2.2   | C            | T491C225(1)025A(2)   | 0.6                               | 6.0                              | 3.5                                |
| 2.2   | B            | T491B225(1)025A(2)   | 0.6                               | 6.0                              | 4.5                                |
| 3.3   | C            | T491C335(1)025A(2)   | 0.9                               | 6.0                              | 2.5                                |
| 3.3   | B            | T491B335(1)025A(2)   | 0.9                               | 6.0                              | 3.5                                |
| 4.7   | C            | T491C475(1)025A(2)   | 1.2                               | 6.0                              | 2.4                                |
| #4.7  | B            | T491B475(1)025A(2)   | 1.2                               | 6.0                              | 1.5                                |
| #4.7  | A            | T491A475M025A(2)     | 1.2                               | 8.0                              | 6.0                                |
| 6.8   | C            | T491C685(1)025A(2)   | 1.7                               | 6.0                              | 1.9                                |
| 6.8   | B            | T491B685(1)025A(2)   | 1.7                               | 8.0                              | 2.8                                |
| 10.0  | D            | T491D106(1)025A(2)   | 2.5                               | 6.0                              | 1.0                                |
| 10.0  | C            | T491C106(1)025A(2)   | 2.5                               | 6.0                              | 1.5                                |
| 10.0  | B            | T491B106(1)025A(2)   | 2.5                               | 8.0                              | 3.0                                |
| 15.0  | D            | T491D156(1)025A(2)   | 3.8                               | 6.0                              | 1.0                                |
| #15.0   | C            | T491C156(1)025A(2)   | 3.8                               | 6.0                              | 1.5                                |
| #15.0   | B            | T491B156(1)025A(2)   | 3.8                               | 8.0                              | 4.0                                |
| 22.0  | D            | T491D226(1)025A(2)   | 5.5                               | 6.0                              | 0.8                                |
| 22.0  | C            | T491C226(1)025A(2)   | 5.5                               | 6.0                              | 1.4                                |
| 22.0  | V            | T491V226(1)025A(2)   | 5.5                               | 6.0                              | 0.7                                |
| 33.0  | X            | T491X336(1)025A(2)   | 8.3                               | 6.0                              | 0.7                                |
| #33.0   | D            | T491D336(1)025A(2)   | 8.3                               | 6.0                              | 0.7                                |
| #33.0   | C            | T491C336(1)025A(2)   | 8.3                               | 10.0                             | 1.2                                |
| #47.0   | X            | T491X476(1)025A(2)   | 11.8                              | 6.0                              | 0.7                                |
| †47.0   | D            | T491D476(1)025A(2)   | 11.8                              | 10.0                             | 0.7                                |
| †68.0   | X            | T491X686M025A(2)     | 17.0                              | 8.0                              | 0.7                                |
| †68.0   | D            | T491D686M025A(2)     | 17.0                              | 10.0                             | 0.7                                |
| 100.0   | X            | T491X107(1)025A(2)   | 25.0                              | 8.0                              | 0.3                                |

(1) To complete KEMET Part Number, insert M for ±20% tolerance or K for ±10% tolerance.  
 (2) To complete KEMET Part Number, insert T, H, G lead material designation as shown on page 15.  
 \*Extended Values

†6 Volt product equivalent to 6.3 volt product.

#Maximum Capacitance Change @ 125°C=+15%.

†Maximum Capacitance Change @ 125°C=+20%.

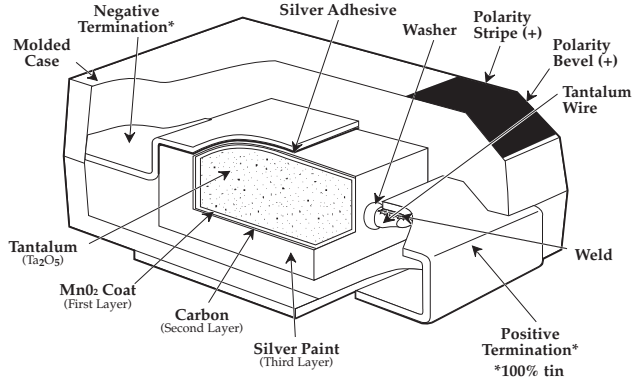
Higher voltage ratings and tighter tolerance product may be substituted within the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage rating.



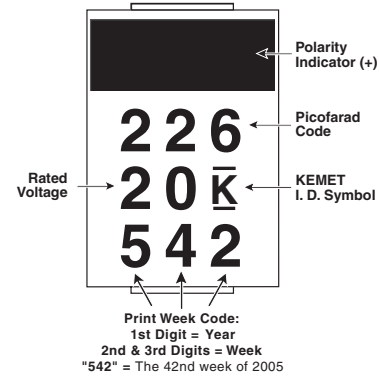
### T491 RATINGS & PART NUMBER REFERENCE

| Capacitance<br>μF   | Case<br>Size | KEMET<br>Part Number | DC<br>Leakage<br>μA @ 25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | ESR Ω<br>@ +25°C<br>100 kHz<br>Max |
|---|--------------|----------------------|-----------------------------------|----------------------------------|------------------------------------|
| <b>35 Volt Rating at +85°C (23 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 0.10  | A            | T491A104(1)035A(2)   | 0.5                               | 4.0                              | 20.0                               |
| 0.15  | A            | T491A154(1)035A(2)   | 0.5                               | 4.0                              | 19.0                               |
| 0.22  | A            | T491A224(1)035A(2)   | 0.5                               | 4.0                              | 18.0                               |
| 0.33  | A            | T491A334(1)035A(2)   | 0.5                               | 4.0                              | 15.0                               |
| 0.47  | B            | T491B474(1)035A(2)   | 0.5                               | 4.0                              | 8.0                                |
| 0.47  | A            | T491A474(1)035A(2)   | 0.5                               | 4.0                              | 12.0                               |
| 0.68  | B            | T491B684(1)035A(2)   | 0.5                               | 4.0                              | 6.5                                |
| 0.68  | A            | T491A684(1)035A(2)   | 0.5                               | 4.0                              | 8.0                                |
| 1.0   | B            | T491B105(1)035A(2)   | 0.5                               | 4.0                              | 5.0                                |
| 1.0   | A            | T491A105(1)035A(2)   | 0.5                               | 4.0                              | 7.5                                |
| 1.5   | C            | T491C155(1)035A(2)   | 0.5                               | 6.0                              | 4.5                                |
| 1.5   | B            | T491B155(1)035A(2)   | 0.5                               | 6.0                              | 5.0                                |
| 2.2   | C            | T491C225(1)035A(2)   | 0.8                               | 6.0                              | 3.5                                |
| 2.2   | B            | T491B225(1)035A(2)   | 0.8                               | 6.0                              | 4.0                                |
| 3.3   | C            | T491C335(1)035A(2)   | 1.2                               | 6.0                              | 2.5                                |
| #3.3  | B            | T491B335(1)035A(2)   | 1.2                               | 6.0                              | 3.5                                |
| 4.7   | D            | T491D475(1)035A(2)   | 1.7                               | 6.0                              | 1.5                                |
| 4.7   | C            | T491C475(1)035A(2)   | 1.7                               | 6.0                              | 2.2                                |
| 6.8   | D            | T491D685(1)035A(2)   | 2.4                               | 6.0                              | 1.3                                |
| 6.8   | C            | T491C685(1)035A(2)   | 2.4                               | 6.0                              | 1.8                                |
| 10.0  | D            | T491D106(1)035A(2)   | 3.5                               | 6.0                              | 1.0                                |
| #10.0   | C            | T491C106M035A(2)     | 3.5                               | 6.0                              | 1.6                                |
| #10.0   | V            | T491V106(1)035A(2)   | 3.5                               | 6.0                              | 2.0                                |
| 15.0  | X            | T491X156(1)035A(2)   | 5.3                               | 6.0                              | 0.9                                |
| 15.0  | D            | T491D156(1)035A(2)   | 5.3                               | 6.0                              | 0.8                                |
| 22.0  | X            | T491X226(1)035A(2)   | 7.7                               | 6.0                              | 0.7                                |
| #22.0   | D            | T491D226(1)035A(2)   | 7.7                               | 6.0                              | 0.7                                |
| #33.0   | X            | T491X336(1)035A(2)   | 11.6                              | 6.0                              | 0.6                                |
| †47.0   | X            | T491X476(1)035A(2)   | 16.5                              | 8.0                              | 0.6                                |
| #47.0   | E            | T491E476(1)035A(2)   | 16.5                              | 10.0                             | 0.5                                |
| <b>50 Volt Rating at +85°C (33 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 0.10  | A            | T491A104(1)050A(2)   | 0.5                               | 4.0                              | 20.0                               |
| 0.15  | B            | T491B154(1)050A(2)   | 0.5                               | 4.0                              | 16.0                               |
| 0.15  | A            | T491A154(1)050A(2)   | 0.5                               | 4.0                              | 15.0                               |
| 0.22  | B            | T491B224(1)050A(2)   | 0.5                               | 4.0                              | 14.0                               |
| 0.33  | B            | T491B334(1)050A(2)   | 0.5                               | 4.0                              | 10.0                               |
| 0.47  | C            | T491C474(1)050A(2)   | 0.5                               | 4.0                              | 8.0                                |
| 0.47  | B            | T491B474(1)050A(2)   | 0.5                               | 4.0                              | 9.0                                |
| 0.68  | C            | T491C684(1)050A(2)   | 0.5                               | 4.0                              | 7.0                                |
| 0.68  | B            | T491B684(1)050A(2)   | 0.5                               | 4.0                              | 8.0                                |
| 1.0   | C            | T491C105(1)050A(2)   | 0.5                               | 4.0                              | 5.5                                |
| 1.0   | B            | T491B105(1)050A(2)   | 0.5                               | 6.0                              | 6.0                                |
| 1.0   | V            | T491V105(1)050A(2)   | 0.5                               | 4.0                              | 6.0                                |
| 1.5   | D            | T491D155(1)050A(2)   | 0.8                               | 6.0                              | 3.5                                |
| 1.5   | C            | T491C155(1)050A(2)   | 0.8                               | 6.0                              | 4.5                                |
| 2.2   | D            | T491D225(1)050A(2)   | 1.1                               | 6.0                              | 2.5                                |
| 2.2   | C            | T491C225(1)050A(2)   | 1.1                               | 6.0                              | 3.0                                |
| 3.3   | D            | T491D335(1)050A(2)   | 1.7                               | 6.0                              | 2.0                                |
| 4.7   | D            | T491D475(1)050A(2)   | 2.4                               | 6.0                              | 1.4                                |
| 6.8   | X            | T491X685(1)050A(2)   | 3.5                               | 6.0                              | 1.0                                |
| #6.8  | D            | T491D685(1)050A(2)   | 3.4                               | 6.0                              | 1.0                                |
| #10.0   | X            | T491X106M050A(2)     | 5.0                               | 6.0                              | 0.7                                |
| #10.0   | D            | T491D106(1)050A(2)   | 5.0                               | 6.0                              | 0.8                                |
| †15.0   | X            | T491X156(1)050A(2)   | 7.5                               | 8.0                              | 0.7                                |
| 22.0  | X            | T491X226(1)050A(2)   | 11.0                              | 10.0                             | 0.6                                |

### CONSTRUCTION



### CAPACITOR MARKINGS

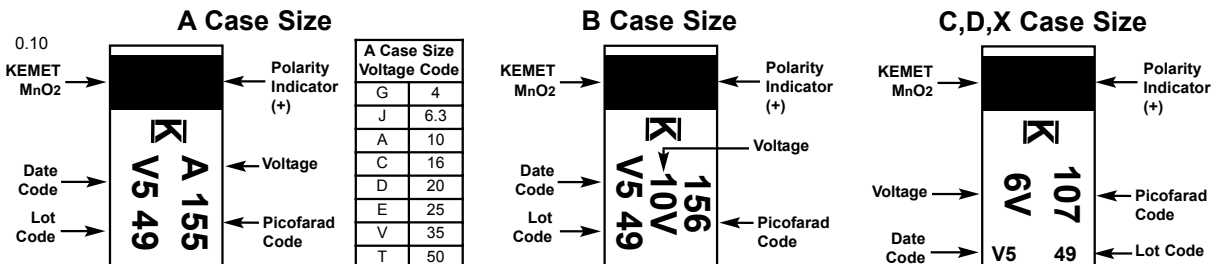


(1) To complete KEMET Part Number, insert M for ±20% tolerance or K for ±10% tolerance.  
 (2) To complete KEMET Part Number, insert T, H, G lead material designation as shown on page 15.  
 \*Extended Values

\*\*6 Volt product equivalent to 6.3 volt product.  
 #Maximum Capacitance Change @ 125°C=+15%.  
 †Maximum Capacitance Change @ 125°C=+20%.

Higher voltage ratings and tighter tolerance product may be substituted within the same size at KEMET's option.  
 Voltage substitutions will be marked with the higher voltage rating.

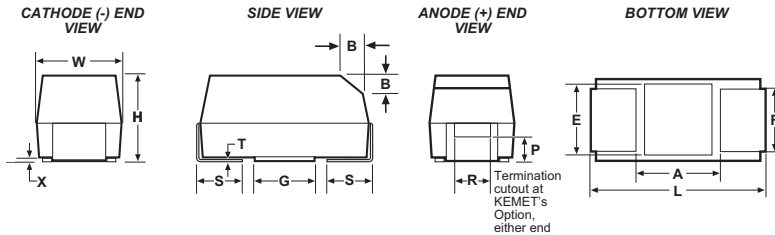
### CAPACITOR ALTERNATE MARKINGS



| Date Code - Year |          | Date Code - Month |           |               |               |
|------------------|----------|-------------------|-----------|---------------|---------------|
| S = 2004         | V = 2007 | 1 = January       | 4 = April | 7 = July      | 10 = October  |
| T = 2005         | W = 2008 | 2 = February      | 5 = May   | 8 = August    | 11 = November |
| U = 2006         | X = 2009 | 3 = March         | 6 = June  | 9 = September | 12 = December |

- Established reliability military version of Industrial Grade T491 series
- Taped and reeled per EIA 481-1
- Precision-molded, laser-marked case
- Symmetrical, compliant terminations
- 100% Surge Current test available for all case sizes
- Operating Temperature: -55°C to +125°C
- Qualified to MIL-PRF-55365/8, Style CWR11:
  - Termination Options B, C, H, K
  - Weibull failure rate codes B, C and D
  - Capacitance values and voltages as shown in following part number table. (Contact KEMET for latest qualification status)

### T492 OUTLINE DRAWINGS

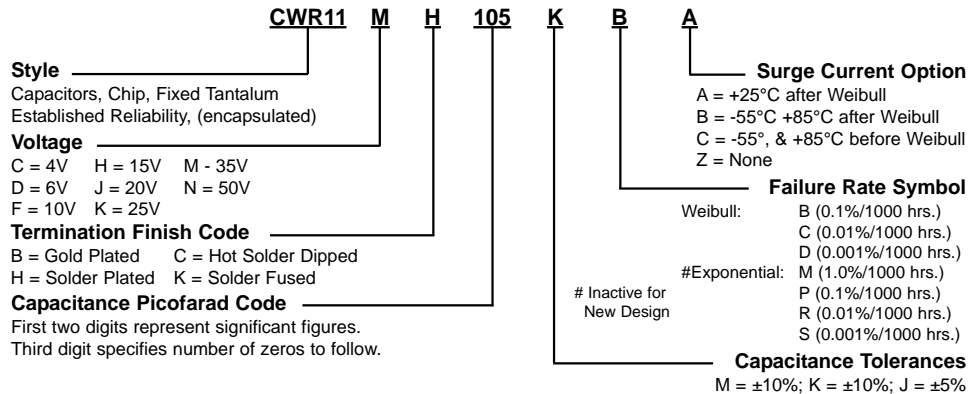


### DIMENSIONS – Millimeters (Inches)

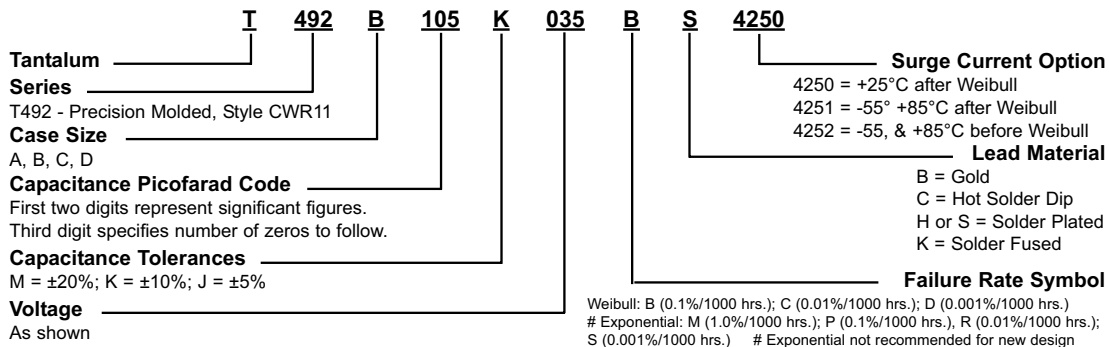
| Case Size |         | Component                  |                            |                            |                      |                      |                          |                              |               |               |                |               |               |               |  |
|-----------|---------|----------------------------|----------------------------|----------------------------|----------------------|----------------------|--------------------------|------------------------------|---------------|---------------|----------------|---------------|---------------|---------------|--|
| KEMET     | EIA     | L*                         | W*                         | H*                         | F* ± 0.1<br>± (.004) | S* ± 0.3<br>± (.012) | B ± 0.15<br>(Ref) ± .006 | X<br>(Ref)                   | P<br>(Ref)    | R<br>(Ref)    | T<br>(Ref)     | A<br>(Min)    | G<br>(Ref)    | E<br>(Ref)    |  |
| A         | 3216-18 | 3.2 ± 0.2<br>(.126 ± .008) | 1.6 ± 0.2<br>(.063 ± .008) | 1.6 ± 0.2<br>(.063 ± .008) | 1.2<br>(.047)        | 0.8<br>(.031)        | 0.4<br>(.016)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.4<br>(.016) | 0.4<br>(.016) | 0.13<br>(.005) | 1.4<br>(.055) | 1.1<br>(.043) | 1.3<br>(.051) |  |
| B         | 3528-21 | 3.5 ± 0.2<br>(.138 ± .008) | 2.8 ± 0.2<br>(.110 ± .008) | 1.9 ± 0.2<br>(.075 ± .008) | 2.2<br>(.087)        | 0.8<br>(.031)        | 0.4<br>(.016)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.5<br>(.020) | 1.0<br>(.039) | 0.13<br>(.005) | 1.1<br>(.043) | 1.8<br>(.071) | 2.2<br>(.087) |  |
| C         | 6032-28 | 6.0 ± 0.3<br>(.236 ± .012) | 3.2 ± 0.3<br>(.126 ± .012) | 2.5 ± 0.3<br>(.098 ± .012) | 2.2<br>(.087)        | 1.3<br>(.051)        | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.9<br>(.035) | 1.0<br>(.039) | 0.13<br>(.005) | 3.1<br>(.122) | 2.8<br>(.110) | 2.4<br>(.094) |  |
| D         | 7343-31 | 7.3 ± 0.3<br>(.287 ± .012) | 4.3 ± 0.3<br>(.169 ± .012) | 2.8 ± 0.3<br>(.110 ± .012) | 2.4<br>(.094)        | 1.3<br>(.051)        | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.9<br>(.035) | 1.0<br>(.039) | 0.13<br>(.005) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |  |

Notes: 1. Metric dimensions govern  
 2. (Ref) Dimensions provided for reference only  
 \* Mil-PRF-55365/8 Specified Dimensions

### ORDERING INFORMATION — MIL-PRF-55365 Part Number



### T492 SERIES ORDERING INFORMATION — KEMET Part Number



\* Part Number Example: T492B105K035BS (14 digits - no spaces)  
 \* See [www.kemet.com](http://www.kemet.com) for Pb Free transition.

# Note on Failure Rates: Exponential failure rate levels M, P, R and S are inactive for new design per Mil-C-55365. Parts qualified to Weibull failure rate levels are substitutable for exponential failure rate levels.

# SOLID TANTALUM CHIP CAPACITORS

## T492 SERIES – Style CWR11 Per Mil-PRF-55365/8



### T492 (CWR11) RATINGS AND PART NUMBER REFERENCE

Solid Tantalum Surface Mount

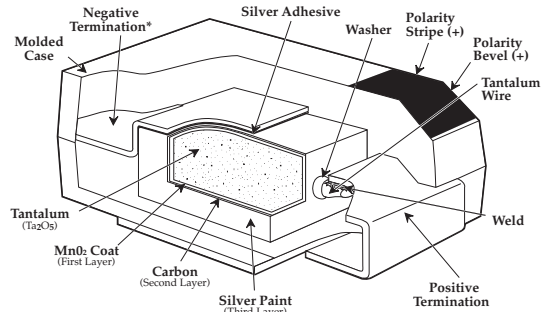
| Capacitance $\mu\text{F}$                                 | Case Size | KEMET Part Number       | Mil-C-55365/8 Part Number | DCL $\mu\text{A}$ @ +25°C Max | DF % @ +25°C 120 Hz Max | ESR $\Omega$ @ +25°C 100kHz Max |
|---|-----------|-------------------------|---------------------------|-------------------------------|-------------------------|---------------------------------|
| <b>4 Volt Rating at +85°C (2.7 Volt Rating at +125°C)</b> |           |                         |                           |                               |                         |                                 |
| 2.2   | A         | T492A225(1)004(2)(3)(4) | CWR11C(6)225(1)(2)(5)     | 0.5                           | 6.0                     | 8.0                             |
| 4.7   | A         | T492A475(1)004(2)(3)(4) | CWR11C(6)475(1)(2)(5)     | 0.5                           | 6.0                     | 8.0                             |
| 6.8   | B         | T492B685(1)004(2)(3)(4) | CWR11C(6)685(1)(2)(5)     | 0.5                           | 6.0                     | 5.5                             |
| 10.0  | B         | T492B106(1)004(2)(3)(4) | CWR11C(6)106(1)(2)(5)     | 0.5                           | 6.0                     | 4.0                             |
| 15.0  | B         | T492B156(1)004(2)(3)(4) | CWR11C(6)156(1)(2)(5)     | 0.6                           | 6.0                     | 3.5                             |
| 33.0  | C         | T492C336(1)004(2)(3)(4) | CWR11C(6)336(1)(2)(5)     | 1.3                           | 6.0                     | 2.2                             |
| 68.0  | D         | T492D686(1)004(2)(3)(4) | CWR11C(6)686(1)(2)(5)     | 2.7                           | 6.0                     | 1.1                             |
| 100.0   | D         | T492D107(1)004(2)(3)(4) | CWR11C(6)107(1)(2)(5)     | 4.0                           | 8.0                     | 0.9                             |
| <b>6.3 Volt Rating at +85°C (4 Volt Rating at +125°C)</b> |           |                         |                           |                               |                         |                                 |
| 1.5   | A         | T492A155(1)006(2)(3)(4) | CWR11D(6)155(1)(2)(5)     | 0.5                           | 6.0                     | 8.0                             |
| 2.2   | A         | T492A225(1)006(2)(3)(4) | CWR11D(6)225(1)(2)(5)     | 0.5                           | 6.0                     | 8.0                             |
| 3.3   | A         | T492A335(1)006(2)(3)(4) | CWR11D(6)335(1)(2)(5)     | 0.5                           | 6.0                     | 8.0                             |
| 4.7   | B         | T492B475(1)006(2)(3)(4) | CWR11D(6)475(1)(2)(5)     | 0.5                           | 6.0                     | 5.5                             |
| 6.8   | B         | T492B685(1)006(2)(3)(4) | CWR11D(6)685(1)(2)(5)     | 0.5                           | 6.0                     | 4.5                             |
| 10.0  | B         | T492B106(1)006(2)(3)(4) | CWR11D(6)106(1)(2)(5)     | 0.6                           | 6.0                     | 3.5                             |
| 15.0  | C         | T492C156(1)006(2)(3)(4) | CWR11D(6)156(1)(2)(5)     | 0.9                           | 6.0                     | 3.0                             |
| 22.0  | C         | T492C226(1)006(2)(3)(4) | CWR11D(6)226(1)(2)(5)     | 1.4                           | 6.0                     | 2.2                             |
| 47.0  | D         | T492D476(1)006(2)(3)(4) | CWR11D(6)476(1)(2)(5)     | 2.8                           | 6.0                     | 1.1                             |
| 68.0  | D         | T492D686(1)006(2)(3)(4) | CWR11D(6)686(1)(2)(5)     | 4.3                           | 6.0                     | 0.9                             |
| <b>10 Volt Rating at +85°C (7 Volt Rating at 125°C)</b>   |           |                         |                           |                               |                         |                                 |
| 1.0   | A         | T492A105(1)010(2)(3)(4) | CWR11F(6)105(1)(2)(5)     | 0.5                           | 4.0                     | 10.0                            |
| 1.5   | A         | T492A155(1)010(2)(3)(4) | CWR11F(6)155(1)(2)(5)     | 0.5                           | 6.0                     | 8.0                             |
| 2.2   | A         | T492A225(1)010(2)(3)(4) | CWR11F(6)225(1)(2)(5)     | 0.5                           | 6.0                     | 8.0                             |
| 3.3   | B         | T492B335(1)010(2)(3)(4) | CWR11F(6)335(1)(2)(5)     | 0.5                           | 6.0                     | 5.5                             |
| 4.7   | B         | T492B475(1)010(2)(3)(4) | CWR11F(6)475(1)(2)(5)     | 0.5                           | 6.0                     | 4.5                             |
| 6.8   | B         | T492B685(1)010(2)(3)(4) | CWR11F(6)685(1)(2)(5)     | 0.7                           | 6.0                     | 3.5                             |
| 15.0  | C         | T492C156(1)010(2)(3)(4) | CWR11F(6)156(1)(2)(5)     | 1.5                           | 6.0                     | 2.5                             |
| 33.0  | D         | T492D336(1)010(2)(3)(4) | CWR11F(6)336(1)(2)(5)     | 3.3                           | 6.0                     | 1.1                             |
| 47.0  | D         | T492D476(1)010(2)(3)(4) | CWR11F(6)476(1)(2)(5)     | 4.7                           | 6.0                     | 0.9                             |
| <b>15 Volt Rating at +85°C (10 Volt Rating at +125°C)</b> |           |                         |                           |                               |                         |                                 |
| 0.7   | A         | T492A684(1)015(2)(3)(4) | CWR11H(6)684(1)(2)(5)     | 0.5                           | 4.0                     | 12.0                            |
| 1.0   | A         | T492A105(1)015(2)(3)(4) | CWR11H(6)105(1)(2)(5)     | 0.5                           | 4.0                     | 10.0                            |
| 1.5   | A         | T492A155(1)015(2)(3)(4) | CWR11H(6)155(1)(2)(5)     | 0.5                           | 6.0                     | 8.0                             |
| 2.2   | B         | T492B225(1)015(2)(3)(4) | CWR11H(6)225(1)(2)(5)     | 0.5                           | 6.0                     | 5.5                             |
| 3.3   | B         | T492B335(1)015(2)(3)(4) | CWR11H(6)335(1)(2)(5)     | 0.5                           | 6.0                     | 5.0                             |
| 4.7   | B         | T492B475(1)015(2)(3)(4) | CWR11H(6)475(1)(2)(5)     | 0.7                           | 6.0                     | 4.0                             |
| 10.0  | C         | T492C106(1)015(2)(3)(4) | CWR11H(6)106(1)(2)(5)     | 1.6                           | 6.0                     | 2.5                             |
| 22.0  | D         | T492D226(1)015(2)(3)(4) | CWR11H(6)226(1)(2)(5)     | 3.3                           | 6.0                     | 1.1                             |
| 33.0  | D         | T492D336(1)015(2)(3)(4) | CWR11H(6)336(1)(2)(5)     | 5.3                           | 6.0                     | 0.9                             |
| <b>20 Volt Rating at +85°C (13 Volt Rating at +125°C)</b> |           |                         |                           |                               |                         |                                 |
| 0.5   | A         | T492A474(1)020(2)(3)(4) | CWR11J(6)474(1)(2)(5)     | 0.5                           | 4.0                     | 14.0                            |
| 0.7   | A         | T492A684(1)020(2)(3)(4) | CWR11J(6)684(1)(2)(5)     | 0.5                           | 4.0                     | 12.0                            |
| 1.0   | A         | T492A105(1)020(2)(3)(4) | CWR11J(6)105(1)(2)(5)     | 0.5                           | 4.0                     | 10.0                            |
| 1.5   | B         | T492B155(1)020(2)(3)(4) | CWR11J(6)155(1)(2)(5)     | 0.5                           | 6.0                     | 6.0                             |
| 2.2   | B         | T492B225(1)020(2)(3)(4) | CWR11J(6)225(1)(2)(5)     | 0.5                           | 6.0                     | 5.0                             |
| 3.3   | B         | T492B335(1)020(2)(3)(4) | CWR11J(6)335(1)(2)(5)     | 0.7                           | 6.0                     | 4.0                             |
| 4.7   | C         | T492C475(1)020(2)(3)(4) | CWR11J(6)475(1)(2)(5)     | 1.0                           | 6.0                     | 3.0                             |
| 6.8   | C         | T492C685(1)020(2)(3)(4) | CWR11J(6)685(1)(2)(5)     | 1.4                           | 6.0                     | 2.4                             |
| 15.0  | D         | T492D156(1)020(2)(3)(4) | CWR11J(6)156(1)(2)(5)     | 3.0                           | 6.0                     | 1.1                             |
| 22.0  | D         | T492D226(1)020(2)(3)(4) | CWR11J(6)226(1)(2)(5)     | 4.4                           | 6.0                     | 0.9                             |
| <b>25 Volt Rating at +85°C (17 Volt Rating at +125°C)</b> |           |                         |                           |                               |                         |                                 |
| 0.3   | A         | T492A334(1)025(2)(3)(4) | CWR11K(6)334(1)(2)(5)     | 0.5                           | 4.0                     | 15.0                            |
| 0.5   | A         | T492A474(1)025(2)(3)(4) | CWR11K(6)474(1)(2)(5)     | 0.5                           | 4.0                     | 14.0                            |
| 0.7   | B         | T492B684(1)025(2)(3)(4) | CWR11K(6)684(1)(2)(5)     | 0.5                           | 4.0                     | 7.5                             |
| 1.0   | B         | T492B105(1)025(2)(3)(4) | CWR11K(6)105(1)(2)(5)     | 0.5                           | 4.0                     | 6.5                             |
| 1.5   | B         | T492B155(1)025(2)(3)(4) | CWR11K(6)155(1)(2)(5)     | 0.5                           | 6.0                     | 6.5                             |
| 2.2   | C         | T492C225(1)025(2)(3)(4) | CWR11K(6)225(1)(2)(5)     | 0.6                           | 6.0                     | 3.5                             |
| 3.3   | C         | T492C335(1)025(2)(3)(4) | CWR11K(6)335(1)(2)(5)     | 0.9                           | 6.0                     | 3.5                             |
| 4.7   | C         | T492C475(1)025(2)(3)(4) | CWR11K(6)475(1)(2)(5)     | 1.2                           | 6.0                     | 2.5                             |
| 6.8   | D         | T492D685(1)025(2)(3)(4) | CWR11K(6)685(1)(2)(5)     | 1.7                           | 6.0                     | 1.4                             |
| 10.0  | D         | T492D106(1)025(2)(3)(4) | CWR11K(6)106(1)(2)(5)     | 2.5                           | 6.0                     | 1.2                             |
| 15.0  | D         | T492D156(1)025(2)(3)(4) | CWR11K(6)156(1)(2)(5)     | 3.8                           | 6.0                     | 1.0                             |
| <b>35 Volt Rating at +85°C (23 Volt Rating at +125°C)</b> |           |                         |                           |                               |                         |                                 |
| 0.1   | A         | T492A104(1)035(2)(3)(4) | CWR11M(6)104(1)(2)(5)     | 0.5                           | 4.0                     | 24.0                            |
| 0.2   | A         | T492A154(1)035(2)(3)(4) | CWR11M(6)154(1)(2)(5)     | 0.5                           | 4.0                     | 21.0                            |
| 0.2   | A         | T492A224(1)035(2)(3)(4) | CWR11M(6)224(1)(2)(5)     | 0.5                           | 4.0                     | 18.0                            |
| 0.3   | A         | T492A334(1)035(2)(3)(4) | CWR11M(6)334(1)(2)(5)     | 0.5                           | 4.0                     | 15.0                            |
| 0.5   | B         | T492B474(1)035(2)(3)(4) | CWR11M(6)474(1)(2)(5)     | 0.5                           | 4.0                     | 10.0                            |
| 0.7   | B         | T492B684(1)035(2)(3)(4) | CWR11M(6)684(1)(2)(5)     | 0.5                           | 4.0                     | 8.0                             |
| 1.0   | B         | T492B105(1)035(2)(3)(4) | CWR11M(6)105(1)(2)(5)     | 0.5                           | 4.0                     | 6.5                             |
| 1.5   | C         | T492C155(1)035(2)(3)(4) | CWR11M(6)155(1)(2)(5)     | 0.5                           | 6.0                     | 4.5                             |
| 2.2   | C         | T492C225(1)035(2)(3)(4) | CWR11M(6)225(1)(2)(5)     | 0.8                           | 6.0                     | 3.5                             |
| 3.3   | C         | T492C335(1)035(2)(3)(4) | CWR11M(6)335(1)(2)(5)     | 1.2                           | 6.0                     | 2.5                             |
| 4.7   | D         | T492D475(1)035(2)(3)(4) | CWR11M(6)475(1)(2)(5)     | 1.7                           | 6.0                     | 1.5                             |
| 6.8   | D         | T492D685(1)035(2)(3)(4) | CWR11M(6)685(1)(2)(5)     | 2.4                           | 6.0                     | 1.3                             |

| Capacitance $\mu\text{F}$                                 | Case Size | KEMET Part Number       | Mil-C-55365/8 Part Number | DCL $\mu\text{A}$ @ +25°C Max | DF % @ +25°C 120 Hz Max | ESR $\Omega$ @ +25°C 100kHz Max |
|---|-----------|-------------------------|---------------------------|-------------------------------|-------------------------|---------------------------------|
| <b>50 Volt Rating at +85°C (33 Volt Rating at +125°C)</b> |           |                         |                           |                               |                         |                                 |
| 0.10  | A         | T492A104(1)050(2)(3)(4) | CWR11N(6)104(1)(2)(5)     | 0.5                           | 6.0                     | 22.0                            |
| 0.15  | B         | T492B154(1)050(2)(3)(4) | CWR11N(6)154(1)(2)(5)     | 0.5                           | 4.0                     | 17.0                            |
| 0.22  | B         | T492B224(1)050(2)(3)(4) | CWR11N(6)224(1)(2)(5)     | 0.5                           | 4.0                     | 14.0                            |
| 0.33  | B         | T492B334(1)050(2)(3)(4) | CWR11N(6)334(1)(2)(5)     | 0.5                           | 4.0                     | 12.0                            |
| 0.47  | C         | T492C474(1)050(2)(3)(4) | CWR11N(6)474(1)(2)(5)     | 0.5                           | 4.0                     | 8.0                             |
| 0.68  | C         | T492C684(1)050(2)(3)(4) | CWR11N(6)684(1)(2)(5)     | 0.5                           | 4.0                     | 7.0                             |
| 1.0   | C         | T492C105(1)050(2)(3)(4) | CWR11N(6)105(1)(2)(5)     | 0.5                           | 4.0                     | 6.0                             |
| 1.5   | D         | T492D155(1)050(2)(3)(4) | CWR11N(6)155(1)(2)(5)     | 0.8                           | 6.0                     | 4.0                             |
| 2.2   | D         | T492D225(1)050(2)(3)(4) | CWR11N(6)225(1)(2)(5)     | 1.1                           | 6.0                     | 2.5                             |
| 3.3   | D         | T492D335(1)050(2)(3)(4) | CWR11N(6)335(1)(2)(5)     | 1.7                           | 6.0                     | 2.0                             |
| 4.7   | D         | T492D475(1)050(2)(3)(4) | CWR11N(6)475(1)(2)(5)     | 2.4                           | 6.0                     | 1.5                             |

## PACKAGING

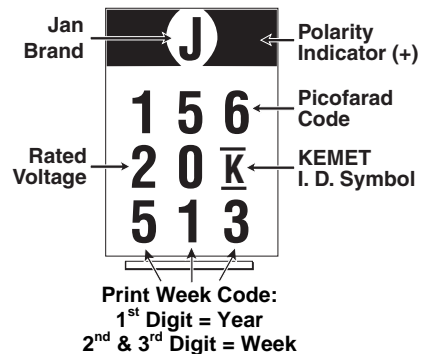
- Note: T492 Packaging**
- No c-spec required for 7" reel packaging
  - C-7280 required for 13" reel packaging
  - Standard reel packaging is not mandatory
  - Bulk packaging also available using C-7610
- See page 91 for tape and reel quantities.

## CONSTRUCTION



## CAPACITOR MARKINGS

### T492 Series — All Case Sizes

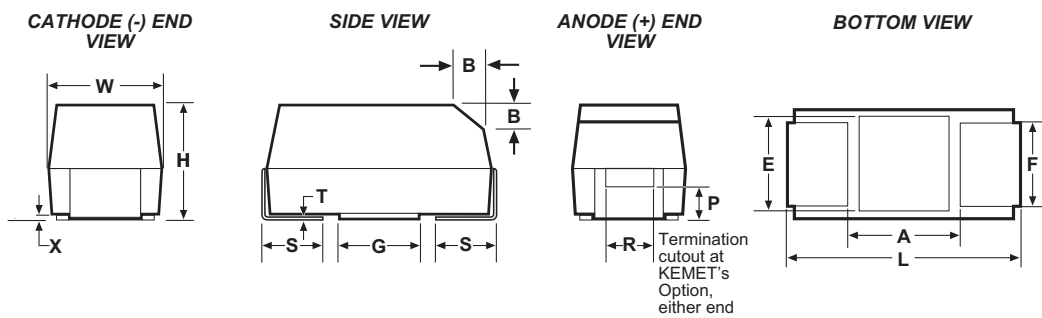


- (1) To complete KEMET/CWR part number, insert M for  $\pm 20\%$ , K for  $\pm 10\%$  or J for  $\pm 5\%$  tolerance.
  - (2) To complete KEMET/CWR part number, insert Failure Rate Symbol Weibull: B (0.1%/1000 Hrs.), C (0.01%/1000Hrs or D (0.001%/1000 hrs.), Exponential: M (1.0%/1000 hrs.), P (0.1%/1000 hrs.), R (0.01%/1000 hrs.) or S (0.001%/1000 hrs.)
  - (3) To complete KEMET part number, insert Termination Finish Designation B = Gold; C = Hot Solder Dipped; S = Solder Plated; K = Solder Fused.
  - (4) To complete KEMET part number, insert 4250 = +25°C after Weibull; 4251 = -55° + 85°C after Weibull; or 4252 = -55, & +85°C before Weibull Surge Current Option.
  - (5) To complete CWR part number, insert A = +25°C after Weibull; B = -55° + 85°C after Weibull; C = -55°, & +85°C before Weibull or Z = None for Surge Current Option.
  - (6) To complete CWR part numbers, insert B = Gold; C = Hot Solder Dipped; H or S = Solder Plated; K = Solder Fused
- Note on Failure Rates:** Exponential failure rate levels M, P, R, and S are inactive for new design per MIL-PRF-55365. Parts qualified to Weibull failure rate levels are substitutable for exponential failure rate levels. Note: ESR limits are per MIL-PRF-55365/8.

### FEATURES

- Standard Cases Sizes A - X per EIA535BAAC
- Termination Finishes offered per MIL-PRF-55365: Gold Plated, Hot Solder Dipped, Solder Plated, Solder Fused, 100% Tin
- Weibull Grading Available: B (0.1%/1000hrs) and C (0.01%/1000hrs)
- Surge Current Testing Available per MIL-PRF-55365: 10 cycles @ +25°C; 10 cycles @ -55°C and +85°C
- Standard and Low ESR Options
- Operating Temperature Range: -55°C to +125°C
- Capacitance: 0.1 to 330µF
- Voltage: 4 to 50 Volts

### OUTLINE DRAWING

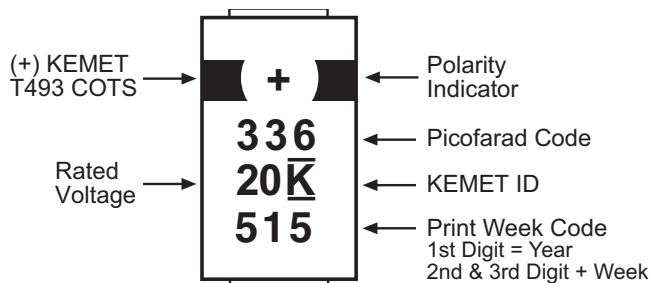


### DIMENSIONS- MILLIMETERS (INCHES)

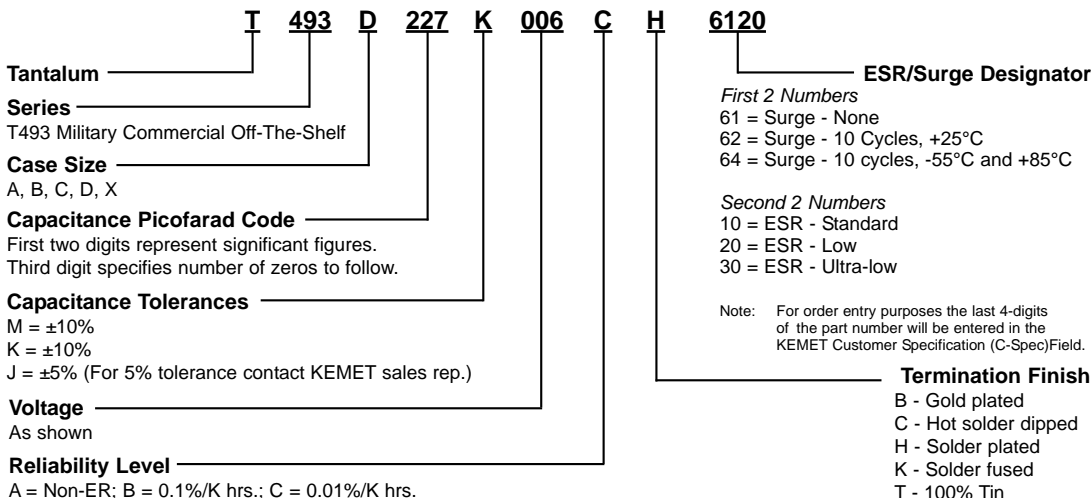
| Case Size |         | L                          | W                          | H                          | F ±0.1        | S ±0.3        | B ±0.15<br>(Ref) ±(.006) | X (Ref)                      | P (Ref)        | R (Ref)       | A (Min)       | G (Ref)       | E (Ref)       |
|-----------|---------|----------------------------|----------------------------|----------------------------|---------------|---------------|--------------------------|------------------------------|----------------|---------------|---------------|---------------|---------------|
| KEMET     | EIA     |                            |                            |                            |               |               |                          |                              |                |               |               |               |               |
| A         | 3216-18 | 3.2 ± 0.2<br>(.126 ± .008) | 1.6 ± 0.2<br>(.063 ± .008) | 1.6 ± 0.2<br>(.063 ± .008) | 1.2<br>(.047) | 0.8<br>(.031) | 0.4<br>(.016)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.4<br>(.016)  | 0.4<br>(.016) | 1.4<br>(.055) | 1.1<br>(.043) | 1.3<br>(.051) |
| B         | 3528-21 | 3.5 ± 0.2<br>(.138 ± .008) | 2.8 ± 0.2<br>(.110 ± .008) | 1.9 ± 0.1<br>(.075 ± .008) | 2.2<br>(.087) | 0.8<br>(.031) | 0.4<br>(.016)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.5<br>(.020)  | 1.0<br>(.039) | 1.1<br>(.043) | 1.8<br>(.071) | 2.2<br>(.087) |
| C         | 6032-28 | 6.0 ± 0.3<br>(.236 ± .012) | 3.2 ± 0.3<br>(.126 ± .012) | 2.5 ± 0.3<br>(.098 ± .012) | 2.2<br>(.087) | 1.3<br>(.051) | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.9<br>(.0235) | 1.0<br>(.039) | 3.1<br>(.122) | 2.8<br>(.110) | 2.4<br>(.094) |
| D         | 7343-31 | 7.3 ± 0.3<br>(.287 ± .012) | 4.3 ± 0.3<br>(.169 ± .012) | 2.8 ± 0.3<br>(.110 ± .012) | 2.4<br>(.094) | 1.3<br>(.051) | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.9<br>(.0235) | 1.0<br>(.039) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |
| X         | 7343-43 | 7.3 ± 0.3<br>(.287 ± .012) | 4.3 ± 0.3<br>(.169 ± .012) | 4.0 ± 0.3<br>(.157 ± .012) | 2.4<br>(.094) | 1.3<br>(.051) | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 1.7<br>(.067)  | 1.0<br>(.039) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |
| E         | 7260-38 | 7.3 ± 0.3<br>(.287 ± .012) | 6.0 ± 0.3<br>(.236 ± .012) | 3.6 ± 0.2<br>(.142 ± .008) | 4.1<br>(.161) | 1.3<br>(.051) | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.9<br>(.035)  | 1.0<br>(.039) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |

1. Metric dimensions govern.
2. (ref) - Dimensions provided for reference only.

### COMPONENT MARKING



### ORDERING INFORMATION



### T493 RATINGS AND PART NUMBER REFERENCE

| Capacitance<br>µF   | Case Size | KEMET Part Number          | DCL<br>µA @<br>25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | Std. ESR<br>Ohms<br>@+25°C<br>100 kHz<br>Max | Low ESR<br>Ohms<br>@+25°C<br>100 kHz<br>Max | Ultra-Low<br>ESR, Ohms<br>@+25°C<br>100 kHz<br>Max |
|---|-----------|----------------------------|----------------------------|----------------------------------|--|---|--|
| <b>4 Volt Rating at +85°C (2.7 Volt Rating at +125°C)</b> |           |                            |                            |                                  |  |   |  |
| 2.2   | A         | T493A225(1)004(2)(3)(4)(5) | 0.5                        | 6.0                              | 8.0  | 6.0   | N/A  |
| 3.3   | A         | T493A335(1)004(2)(3)(4)(5) | 0.5                        | 6.0                              | 8.0  | 4.0   | N/A  |
| 4.7   | A         | T493A475(1)004(2)(3)(4)(5) | 0.5                        | 6.0                              | 8.0  | 3.5   | N/A  |
| 6.8   | A         | T493A685(1)004(2)(3)(4)(5) | 0.5                        | 6.0                              | 6.0  | 3.0   | N/A  |
| 6.8   | B         | T493B685(1)004(2)(3)(4)(5) | 0.5                        | 6.0                              | 5.5  | 2.0   | N/A  |
| 10.0  | A         | T493A106(1)004(2)(3)(4)(5) | 0.5                        | 6.0                              | 6.0  | 2.0   | N/A  |
| 10.0  | B         | T493B106(1)004(2)(3)(4)(5) | 0.5                        | 6.0                              | 3.5  | 1.2   | N/A  |
| 15.0  | A         | T493A156(1)004(2)(3)(4)(5) | 0.6                        | 6.0                              | 4.0  | 1.5   | N/A  |
| 15.0  | B         | T493B156(1)004(2)(3)(4)(5) | 0.6                        | 6.0                              | 3.5  | 1.2   | N/A  |
| 22.0  | A         | T493A226(1)004(2)(3)(4)(5) | 0.9                        | 6.0                              | 4.0  | 1.5   | N/A  |
| 22.0  | B         | T493B226(1)004(2)(3)(4)(5) | 0.9                        | 6.0                              | 3.5  | 0.6   | N/A  |
| 22.0  | C         | T493C226(1)004(2)(3)(4)(5) | 0.9                        | 6.0                              | 1.8  | 0.5   | N/A  |
| 33.0  | A         | T493A336(1)004(2)(3)(4)(5) | 1.3                        | 6.0                              | 4.0  | 3.0   | N/A  |
| 33.0  | B         | T493B336(1)004(2)(3)(4)(5) | 1.3                        | 6.0                              | 3.5  | 0.5   | N/A  |
| 33.0  | C         | T493C336(1)004(2)(3)(4)(5) | 1.3                        | 6.0                              | 1.8  | 0.5   | N/A  |
| 47.0  | B         | T493B476(1)004(2)(3)(4)(5) | 1.9                        | 6.0                              | 3.0  | 0.5   | N/A  |
| 47.0  | C         | T493C476(1)004(2)(3)(4)(5) | 1.9                        | 6.0                              | 1.8  | 0.5   | N/A  |
| 68.0  | B         | T493B686(1)004(2)(3)(4)(5) | 2.7                        | 6.0                              | 3.5  | 2.0   | N/A  |
| 68.0  | C         | T493C686(1)004(2)(3)(4)(5) | 2.7                        | 6.0                              | 1.6  | 0.25  | N/A  |
| 68.0  | D         | T493D686(1)004(2)(3)(4)(5) | 2.7                        | 6.0                              | 0.8  | 0.2   | N/A  |
| #100.0  | B         | T493B107(1)004(2)(3)(4)(5) | 4.0                        | 8.0                              | 1.0  | 0.7   | 0.50   |
| 100.0   | C         | T493C107(1)004(2)(3)(4)(5) | 4.0                        | 8.0                              | 1.2  | 0.2   | N/A  |
| 100.0   | D         | T493D107(1)004(2)(3)(4)(5) | 4.0                        | 8.0                              | 0.8  | 0.2   | N/A  |
| #150.0  | C         | T493C157(1)004(2)(3)(4)(5) | 6.0                        | 8.0                              | 1.2  | 0.3   | 0.25   |
| 150.0   | D         | T493D157(1)004(2)(3)(4)(5) | 6.0                        | 8.0                              | 0.8  | 0.15  | N/A  |
| 220.0   | D         | T493D227(1)004(2)(3)(4)(5) | 8.8                        | 8.0                              | 0.9  | 0.7   | N/A  |
| 330.0   | D         | T493D337(1)004(2)(3)(4)(5) | 13.2                       | 8.0                              | 0.7  | 0.15  | N/A  |
| 330.0   | X         | T493X337(1)004(2)(3)(4)(5) | 13.2                       | 8.0                              | 0.5  | 0.2   | N/A  |
| <b>6.3 Volt Rating at +85°C (4 Volt Rating at +125°C)</b> |           |                            |                            |                                  |  |   |  |
| 1.5   | A         | T493A155(1)006(2)(3)(4)(5) | 0.5                        | 6.0                              | 8.0  | 6.0   | N/A  |
| 2.2   | A         | T493A225(1)006(2)(3)(4)(5) | 0.5                        | 6.0                              | 8.0  | 6.0   | N/A  |
| 3.3   | A         | T493A335(1)006(2)(3)(4)(5) | 0.5                        | 6.0                              | 8.0  | 6.0   | N/A  |
| 4.7   | A         | T493A475(1)006(2)(3)(4)(5) | 0.5                        | 6.0                              | 6.0  | 3.5   | N/A  |
| 4.7   | B         | T493B475(1)006(2)(3)(4)(5) | 0.5                        | 6.0                              | 5.5  | 3.5   | N/A  |
| 6.8   | A         | T493A685(1)006(2)(3)(4)(5) | 0.5                        | 6.0                              | 6.0  | 2.0   | N/A  |
| 6.8   | B         | T493B685(1)006(2)(3)(4)(5) | 0.5                        | 6.0                              | 3.5  | 1.2   | N/A  |
| 10.0  | A         | T493A106(1)006(2)(3)(4)(5) | 0.6                        | 6.0                              | 4.0  | 2.0   | N/A  |
| 10.0  | B         | T493B106(1)006(2)(3)(4)(5) | 0.6                        | 6.0                              | 3.5  | 1.0   | N/A  |
| 15.0  | A         | T493A156(1)006(2)(3)(4)(5) | 0.9                        | 6.0                              | 4.0  | 1.5   | N/A  |
| 15.0  | B         | T493B156(1)006(2)(3)(4)(5) | 0.9                        | 6.0                              | 3.5  | 0.7   | N/A  |
| 15.0  | C         | T493C156(1)006(2)(3)(4)(5) | 0.9                        | 6.0                              | 1.8  | 0.6   | N/A  |
| 22.0  | A         | T493A226(1)006(2)(3)(4)(5) | 1.4                        | 6.0                              | 4.0  | 3.0   | N/A  |
| 22.0  | B         | T493B226(1)006(2)(3)(4)(5) | 1.4                        | 6.0                              | 3.5  | 0.6   | N/A  |
| 22.0  | C         | T493C226(1)006(2)(3)(4)(5) | 1.4                        | 6.0                              | 1.8  | 0.5   | N/A  |

- To complete KEMET part number, insert M for ±20% or K for ±10% capacitance tolerance. To request ±5% tolerance, contact KEMET sales representative.
- To complete KEMET part number, insert A for Non-ER; B for 0.1%/1000 Hrs.; or C for 0.01%/1000 Hrs. Reliability Level.
- To complete KEMET part number, insert B for Gold Plated (50 µ inch minimum); C for Hot Solder Dipped (60 µ inch minimum); H for Solder Plated (100 µ inch minimum); K for Solder Fused (60 µ inch minimum Termination Finish or T for 100% Tin.
- To complete KEMET part number for Surge Current testing, insert 61 for none; 62 for 10 cycles +25°C; or 64 for 10 cycles, -55°C & +85°C.
- To complete KEMET part number, insert 10 for Standard ESR; 20 for Low ESR or 30 for Ultra-low ESR Option.

# SOLID TANTALUM CHIP CAPACITORS

## T493 SERIES—Military COTS

### T493 RATINGS AND PART NUMBER REFERENCE

| Capacitance<br>µF   | Case<br>Size | KEMET<br>Part Number       | DCL<br>µA @<br>25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | Std. ESR<br>Ohms<br>@+25°C<br>100 kHz<br>Max | Low ESR<br>Ohms<br>@+25°C<br>100 kHz<br>Max | Ultra-Low<br>ESR, Ohms<br>@+25°C<br>100 kHz<br>Max |
|---|--------------|----------------------------|----------------------------|----------------------------------|--|---|--|
| <b>6.3 Volt Rating at +85°C (4 Volt Rating at +125°C) cont.</b> |              |                            |                            |                                  |  |   |  |
| 33.0  | B            | T493B336(1)006(2)(3)(4)(5) | 2.0                        | 6.0                              | 3.0  | 0.6   | N/A  |
| 33.0  | C            | T493C336(1)006(2)(3)(4)(5) | 2.0                        | 6.0                              | 1.8  | 0.3   | N/A  |
| 47.0  | B            | T493B476(1)006(2)(3)(4)(5) | 2.9                        | 6.0                              | 3.5  | 2.0   | N/A  |
| 47.0  | C            | T493C476(1)006(2)(3)(4)(5) | 2.9                        | 6.0                              | 1.6  | 0.25  | 0.25   |
| 47.0  | D            | T493D476(1)006(2)(3)(4)(5) | 2.9                        | 6.0                              | 0.8  | 0.22  | N/A  |
| 68.0  | B            | T493B686(1)006(2)(3)(4)(5) | 4.1                        | 8.0                              | 1.0  | 0.65  | N/A  |
| 68.0  | C            | T493C686(1)006(2)(3)(4)(5) | 4.1                        | 6.0                              | 1.2  | 0.2   | N/A  |
| 68.0  | D            | T493D686(1)006(2)(3)(4)(5) | 4.1                        | 6.0                              | 0.8  | 0.2   | 0.18   |
| #100.0  | B            | T493B107(1)006(2)(3)(4)(5) | 6.3                        | 15.0                             | 10.0   | 8.0   | 0.70   |
| 100.0   | C            | T493C107(1)006(2)(3)(4)(5) | 6.0                        | 8.0                              | 1.2  | 0.3   | 0.15   |
| 100.0   | D            | T493D107(1)006(2)(3)(4)(5) | 6.0                        | 8.0                              | 0.8  | 0.15  | N/A  |
| #150.0  | C            | T493C157(1)006(2)(3)(4)(5) | 9.0                        | 8.0                              | 1.2  | 0.3   | 0.20   |
| 150.0   | D            | T493D157(1)006(2)(3)(4)(5) | 9.0                        | 8.0                              | 0.7  | 0.15  | N/A  |
| #220.0  | C            | T493C227(1)006(2)(3)(4)(5) | 13.2                       | 10.0                             | 1.2  | 0.3   | 0.23   |
| 220.0   | D            | T493D227(1)006(2)(3)(4)(5) | 13.2                       | 8.0                              | 0.7  | 0.1   | 0.10   |
| 220.0   | X            | T493X227(1)006(2)(3)(4)(5) | 13.2                       | 8.0                              | 0.7  | 0.15  | 0.07   |
| 330.0   | D            | T493D337(1)006(2)(3)(4)(5) | 19.8                       | 8.0                              | 0.5  | 0.15  | 0.10   |
| 330.0   | X            | T493X337(1)006(2)(3)(4)(5) | 19.8                       | 8.0                              | 0.5  | 0.1   | 0.07   |
| <b>10 Volt Rating at +85°C (7 Volt Rating at +125°C)</b>        |              |                            |                            |                                  |  |   |  |
| 1.0   | A            | T493A105(1)010(2)(3)(4)(5) | 0.5                        | 4.0                              | 10.0   | 6.0   | N/A  |
| 1.5   | A            | T493A155(1)010(2)(3)(4)(5) | 0.5                        | 6.0                              | 8.0  | 6.0   | N/A  |
| 2.2   | A            | T493A225(1)010(2)(3)(4)(5) | 0.5                        | 6.0                              | 8.0  | 6.0   | N/A  |
| 3.3   | A            | T493A335(1)010(2)(3)(4)(5) | 0.5                        | 6.0                              | 6.0  | 4.0   | N/A  |
| 3.3   | B            | T493B335(1)010(2)(3)(4)(5) | 0.5                        | 6.0                              | 5.5  | 3.5   | N/A  |
| 4.7   | A            | T493A475(1)010(2)(3)(4)(5) | 0.5                        | 6.0                              | 6.0  | 3.0   | N/A  |
| 4.7   | B            | T493B475(1)010(2)(3)(4)(5) | 0.5                        | 6.0                              | 3.5  | 1.5   | 1.3  |
| 6.8   | A            | T493A685(1)010(2)(3)(4)(5) | 0.7                        | 6.0                              | 6.0  | 3.0   | N/A  |
| 6.8   | B            | T493B685(1)010(2)(3)(4)(5) | 0.7                        | 6.0                              | 3.5  | 1.2   | 0.90   |
| 10.0  | A            | T493A106(1)010(2)(3)(4)(5) | 1.0                        | 6.0                              | 4.0  | 1.8   | N/A  |
| 10.0  | B            | T493B106(1)010(2)(3)(4)(5) | 1.0                        | 6.0                              | 3.5  | 0.8   | 0.75   |
| 10.0  | C            | T493C106(1)010(2)(3)(4)(5) | 1.0                        | 6.0                              | 1.8  | 0.6   | N/A  |
| #15.0   | A            | T493A156(1)010(2)(3)(4)(5) | 1.5                        | 8.0                              | 6.0  | 4.0   | 3.2  |
| 15.0  | B            | T493B156(1)010(2)(3)(4)(5) | 1.5                        | 6.0                              | 3.5  | 0.7   | N/A  |
| 15.0  | C            | T493C156(1)010(2)(3)(4)(5) | 1.5                        | 6.0                              | 1.8  | 0.5   | 0.48   |
| 22.0  | B            | T493B226(1)010(2)(3)(4)(5) | 2.2                        | 6.0                              | 3.0  | 0.7   | N/A  |
| 22.0  | C            | T493C226(1)010(2)(3)(4)(5) | 2.2                        | 6.0                              | 1.8  | 0.4   | 0.29   |
| 33.0  | B            | T493B336(1)010(2)(3)(4)(5) | 3.3                        | 6.0                              | 3.5  | 2.0   | N/A  |
| 33.0  | C            | T493C336(1)010(2)(3)(4)(5) | 3.3                        | 6.0                              | 1.6  | 0.3   | N/A  |
| 33.0  | D            | T493D336(1)010(2)(3)(4)(5) | 3.3                        | 6.0                              | 0.8  | 0.3   | N/A  |
| 47.0  | C            | T493C476(1)010(2)(3)(4)(5) | 4.7                        | 6.0                              | 1.2  | 0.3   | N/A  |
| 47.0  | D            | T493D476(1)010(2)(3)(4)(5) | 4.7                        | 6.0                              | 0.8  | 0.2   | 0.08   |
| 68.0  | C            | T493C686(1)010(2)(3)(4)(5) | 6.8                        | 6.0                              | 1.2  | 0.3   | 0.23   |
| 68.0  | D            | T493D686(1)010(2)(3)(4)(5) | 6.8                        | 6.0                              | 0.8  | 0.2   | 0.09   |
| 68.0  | X            | T493X686(1)010(2)(3)(4)(5) | 5.4                        | 4.0                              | 0.5  | 0.15  | 0.15   |
| #100.0  | C            | T493C107(1)010(2)(3)(4)(5) | 10.0                       | 8.0                              | 1.2  | 0.3   | N/A  |
| 100.0   | D            | T493D107(1)010(2)(3)(4)(5) | 10.0                       | 8.0                              | 0.7  | 0.1   | 0.08   |
| 150.0   | D            | T493D157(1)010(2)(3)(4)(5) | 15.0                       | 8.0                              | 0.7  | 0.1   | 0.08   |
| 150.0   | X            | T493X157(1)010(2)(3)(4)(5) | 15.0                       | 8.0                              | 0.7  | 0.2   | 0.09   |
| #220.0  | D            | T493D227(1)010(2)(3)(4)(5) | 22.0                       | 8.0                              | 0.5  | 0.2   | 0.08   |
| 220.0   | X            | T493X227(1)010(2)(3)(4)(5) | 22.0                       | 8.0                              | 0.5  | 0.1   | 0.05   |
| 330.0   | X            | T493X337(1)010(2)(3)(4)(5) | 33.0                       | 10.0                             | 0.5  | 0.1   | 0.05   |
| <b>16 Volt Rating at +85°C (10 Volt Rating at +125°C)</b>       |              |                            |                            |                                  |  |   |  |
| 0.68  | A            | T493A684(1)016(2)(3)(4)(5) | 1.1                        | 6.0                              | 12.0   | 8.0   | N/A  |
| 1.0   | A            | T493A105(1)016(2)(3)(4)(5) | 0.5                        | 4.0                              | 10.0   | 6.0   | N/A  |
| 1.5   | A            | T493A155(1)016(2)(3)(4)(5) | 0.5                        | 6.0                              | 8.0  | 6.0   | N/A  |
| 2.2   | A            | T493A225(1)016(2)(3)(4)(5) | 0.5                        | 6.0                              | 6.0  | 4.0   | N/A  |
| 3.3   | A            | T493A335(1)016(2)(3)(4)(5) | 0.5                        | 6.0                              | 6.0  | 3.5   | N/A  |
| 3.3   | B            | T493B335(1)016(2)(3)(4)(5) | 0.5                        | 6.0                              | 3.5  | 2.0   | N/A  |
| 4.7   | A            | T493A475(1)016(2)(3)(4)(5) | 0.8                        | 6.0                              | 6.0  | 3.0   | N/A  |
| 4.7   | B            | T493B475(1)016(2)(3)(4)(5) | 0.8                        | 6.0                              | 3.5  | 1.5   | N/A  |
| #6.8  | A            | T493A685(1)016(2)(3)(4)(5) | 1.1                        | 6.0                              | 7.0  | 3.0   | N/A  |
| 6.8   | B            | T493B685(1)016(2)(3)(4)(5) | 1.1                        | 6.0                              | 3.5  | 1.2   | N/A  |
| 6.8   | C            | T493C685(1)016(2)(3)(4)(5) | 1.1                        | 6.0                              | 1.9  | 0.8   | 0.75   |
| 10.0  | B            | T493B106(1)016(2)(3)(4)(5) | 1.6                        | 6.0                              | 3.5  | 0.8   | N/A  |
| 10.0  | C            | T493C106(1)016(2)(3)(4)(5) | 1.6                        | 6.0                              | 1.8  | 0.6   | N/A  |
| #15.0   | B            | T493B156(1)016(2)(3)(4)(5) | 2.4                        | 6.0                              | 3.0  | 0.8   | 0.80   |
| 15.0  | C            | T493C156(1)016(2)(3)(4)(5) | 2.4                        | 6.0                              | 1.8  | 0.4   | N/A  |
| #22.0   | B            | T493B226(1)016(2)(3)(4)(5) | 3.5                        | 6.0                              | 2.2  | 0.8   | N/A  |
| 22.0  | C            | T493C226(1)016(2)(3)(4)(5) | 3.6                        | 6.0                              | 1.6  | 0.4   | N/A  |
| 22.0  | D            | T493D226(1)016(2)(3)(4)(5) | 3.6                        | 6.0                              | 0.8  | 0.3   | N/A  |

- (1) To complete KEMET part number, insert M for ±20% or K for ±10% capacitance tolerance. To request ±5% tolerance, contact KEMET sales representative.
- (2) To complete KEMET part number, insert A for Non-ER; B for 0.1%/1000 Hrs.; or C for 0.01%/1000 Hrs. Reliability Level.
- (3) To complete KEMET part number, insert B for Gold Plated (50 µ inch minimum); C for Hot Solder Dipped (60 µ inch minimum); H for Solder Plated (100 µ inch minimum); K for Solder Fused (60 µ inch minimum Termination Finish or T for 100% Tin.
- (4) To complete KEMET part number for Surge Current testing, insert 61 for none; 62 for 10 cycles +25°C; or 64 for 10 cycles, -55°C & +85°C.
- (5) To complete KEMET part number, insert 10 for Standard ESR; 20 for Low ESR or 30 for Ultra-low ESR Option.

\* Extended Values #Maximum Capacitance Change @ 125°C = +15%

### T493 RATINGS AND PART NUMBER REFERENCE

| Capacitance<br>µF   | Case<br>Size | KEMET<br>Part Number       | DCL<br>µA @<br>25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | Std. ESR<br>Ohms<br>@+25°C<br>100 kHz<br>Max | Low ESR<br>Ohms<br>@+25°C<br>100 kHz<br>Max | Ultra-Low<br>ESR, Ohms<br>@+25°C<br>100 kHz<br>Max |
|---|--------------|----------------------------|----------------------------|----------------------------------|--|---|--|
| <b>16 Volt Rating at +85°C (10 Volt Rating at +125°C) cont.</b> |              |                            |                            |                                  |  |   |  |
| 33.0  | C            | T493C336(1)016(2)(3)(4)(5) | 5.3                        | 6.0                              | 1.2  | 0.3   | 0.23   |
| 33.0  | D            | T493D336(1)016(2)(3)(4)(5) | 5.3                        | 6.0                              | 0.8  | 0.25  | 0.15   |
| #47.0   | C            | T493C476(1)016(2)(3)(4)(5) | 7.5                        | 6.0                              | 1.2  | 0.5   | 0.35   |
| 47.0  | D            | T493D476(1)016(2)(3)(4)(5) | 7.5                        | 6.0                              | 0.8  | 0.2   | 0.10   |
| 68.0  | D            | T493D686(1)016(2)(3)(4)(5) | 10.9                       | 6.0                              | 0.7  | 0.2   | 0.15   |
| #100.0  | D            | T493D107(1)016(2)(3)(4)(5) | 16.0                       | 8.0                              | 0.7  | 0.125                                       | 0.10   |
| 100.0   | X            | T493X107(1)016(2)(3)(4)(5) | 16.0                       | 8.0                              | 0.7  | 0.1   | 0.08   |
| #150.0  | D            | T493D157(1)016(2)(3)(4)(5) | 24.0                       | 8.0                              | 0.7  | 0.4   | 0.15   |
| #150.0  | X            | T493X157(1)016(2)(3)(4)(5) | 24.0                       | 8.0                              | 0.5  | 0.2   | 0.10   |
| <b>20 Volt Rating at +85°C (13 Volt Rating at +125°C)</b>       |              |                            |                            |                                  |  |   |  |
| 0.47  | A            | T493A474(1)020(2)(3)(4)(5) | 0.5                        | 4.0                              | 14.0   | 9.0   | N/A  |
| 0.68  | A            | T493A684(1)020(2)(3)(4)(5) | 0.5                        | 4.0                              | 12.0   | 8.0   | N/A  |
| 1.0   | A            | T493A105(1)020(2)(3)(4)(5) | 0.5                        | 4.0                              | 10.0   | 5.5   | N/A  |
| 1.5 A   | A            | T493A155(1)020(2)(3)(4)(5) | 0.5                        | 6.0                              | 8.0  | 4.5   | N/A  |
| 1.5 B   | B            | T493B155(1)020(2)(3)(4)(5) | 0.5                        | 6.0                              | 6.0  | 4.0   | N/A  |
| 2.2 A   | A            | T493A225(1)020(2)(3)(4)(5) | 0.5                        | 6.0                              | 7.0  | 4.0   | N/A  |
| 2.2 B   | B            | T493B225(1)020(2)(3)(4)(5) | 0.5                        | 6.0                              | 3.5  | 1.5   | N/A  |
| #3.3  | A            | T493A335(1)020(2)(3)(4)(5) | 0.7                        | 6.0                              | 7.0  | 4.0   | N/A  |
| 3.3   | B            | T493B335(1)020(2)(3)(4)(5) | 0.7                        | 6.0                              | 3.5  | 1.3   | N/A  |
| #4.7  | A            | T493A475(1)020(2)(3)(4)(5) | 1.0                        | 8.0                              | 6.0  | 1.8   | N/A  |
| 4.7   | B            | T493B475(1)020(2)(3)(4)(5) | 1.0                        | 6.0                              | 3.5  | 1.0   | N/A  |
| 4.7   | C            | T493C475(1)020(2)(3)(4)(5) | 1.0                        | 6.0                              | 2.4  | 0.6   | N/A  |
| #6.8  | B            | T493B685(1)020(2)(3)(4)(5) | 1.4                        | 6.0                              | 3.5  | 1.0   | N/A  |
| 6.8   | C            | T493C685(1)020(2)(3)(4)(5) | 1.4                        | 6.0                              | 1.9  | 0.6   | N/A  |
| #10.0   | B            | T493B106(1)020(2)(3)(4)(5) | 2.0                        | 6.0                              | 3.0  | 1.0   | 1.0  |
| 10.0  | C            | T493C106(1)020(2)(3)(4)(5) | 2.0                        | 6.0                              | 1.8  | 0.5   | 0.48   |
| 15.0  | C            | T493C156(1)020(2)(3)(4)(5) | 3.0                        | 6.0                              | 1.7  | 0.4   | 0.38   |
| 15.0  | D            | T493D156(1)020(2)(3)(4)(5) | 3.0                        | 6.0                              | 1.0  | 0.35  | 0.28   |
| #22.0   | C            | T493C226(1)020(2)(3)(4)(5) | 4.4                        | 6.0                              | 1.2  | 0.4   | N/A  |
| 22.0  | D            | T493D226(1)020(2)(3)(4)(5) | 4.4                        | 6.0                              | 0.8  | 0.3   | 0.18   |
| 33.0  | D            | T493D336(1)020(2)(3)(4)(5) | 6.6                        | 6.0                              | 0.8  | 0.2   | 0.15   |
| 47.0  | D            | T493D476(1)020(2)(3)(4)(5) | 9.4                        | 6.0                              | 0.7  | 0.2   | 0.10   |
| 47.0  | X            | T493X476(1)020(2)(3)(4)(5) | 7.5                        | 4.0                              | 0.7  | 0.15  | 0.10   |
| #68.0   | D            | T493D686(1)020(2)(3)(4)(5) | 13.6                       | 8.0                              | 0.7  | 0.2   | 0.15   |
| 68.0  | X            | T493X686(1)020(2)(3)(4)(5) | 13.6                       | 6.0                              | 0.7  | 0.15  | 0.12   |
| <b>25 Volt Rating at +85°C (17 Volt Rating at +125°C)</b>       |              |                            |                            |                                  |  |   |  |
| 0.33  | A            | T493A334(1)025(2)(3)(4)(5) | 0.5                        | 4.0                              | 15.0   | 10.0  | N/A  |
| 0.47  | A            | T493A474(1)025(2)(3)(4)(5) | 0.5                        | 4.0                              | 14.0   | 9.0   | N/A  |
| 0.68 A  | A            | T493A684(1)025(2)(3)(4)(5) | 0.5                        | 4.0                              | 10.0   | 6.0   | N/A  |
| 0.68 B  | B            | T493B684(1)025(2)(3)(4)(5) | 0.5                        | 4.0                              | 7.5  | 5.5   | N/A  |
| 1.0 A   | A            | T493A105(1)025(2)(3)(4)(5) | 0.5                        | 4.0                              | 8.0  | 4.0   | N/A  |
| 1.0 B   | B            | T493B105(1)025(2)(3)(4)(5) | 0.5                        | 4.0                              | 5.0  | 2.0   | N/A  |
| 1.5 A   | A            | T493A155(1)025(2)(3)(4)(5) | 0.5                        | 6.0                              | 10.0   | 3.0   | N/A  |
| 1.5 B   | B            | T493B155(1)025(2)(3)(4)(5) | 0.5                        | 6.0                              | 5.0  | 1.5   | N/A  |
| 2.2 B   | B            | T493B225(1)025(2)(3)(4)(5) | 0.6                        | 6.0                              | 4.5  | 1.2   | N/A  |
| 2.2 C   | C            | T493C225(1)025(2)(3)(4)(5) | 0.6                        | 6.0                              | 3.5  | 2.2   | 1.30   |
| 3.3 B   | B            | T493B335(1)025(2)(3)(4)(5) | 0.9                        | 6.0                              | 3.5  | 2.0   | N/A  |
| 3.3 C   | C            | T493C335(1)025(2)(3)(4)(5) | 0.9                        | 6.0                              | 2.5  | 1.2   | 0.75   |
| #4.7  | B            | T493B475(1)025(2)(3)(4)(5) | 1.2                        | 6.0                              | 1.5  | 1.0   | N/A  |
| 4.7   | C            | T493C475(1)025(2)(3)(4)(5) | 1.2                        | 6.0                              | 2.4  | 0.6   | 0.58   |
| 6.8 C   | C            | T493C685(1)025(2)(3)(4)(5) | 1.7                        | 6.0                              | 1.9  | 0.6   | 0.49   |
| 6.8 D   | D            | T493D685(1)025(2)(3)(4)(5) | 1.7                        | 6.0                              | 1.4  | 1.0   | N/A  |
| 10.0 C  | C            | T493C106(1)025(2)(3)(4)(5) | 2.5                        | 6.0                              | 1.5  | 0.5   | 0.45   |
| 10.0 D  | D            | T493D106(1)025(2)(3)(4)(5) | 2.5                        | 6.0                              | 1.0  | 0.4   | N/A  |
| #15.0   | C            | T493C156(1)025(2)(3)(4)(5) | 3.8                        | 6.0                              | 1.5  | 0.9   | N/A  |
| 15.0  | D            | T493D156(1)025(2)(3)(4)(5) | 3.8                        | 6.0                              | 1.0  | 0.35  | 0.28   |
| 15.0  | X            | T493X156(1)025(2)(3)(4)(5) | 3.0                        | 6.0                              | 0.7  | 0.2   | 0.20   |
| 22.0  | D            | T493D226(1)025(2)(3)(4)(5) | 5.5                        | 6.0                              | 0.8  | 0.2   | 0.20   |
| 22.0  | X            | T493X226(1)025(2)(3)(4)(5) | 4.4                        | 4.0                              | 0.7  | 0.23  | 0.23   |
| 33.0  | D            | T493D336(1)025(2)(3)(4)(5) | 8.3                        | 6.0                              | 0.7  | 0.4   | 0.09   |
| 33.0  | X            | T493X336(1)025(2)(3)(4)(5) | 8.3                        | 6.0                              | 0.7  | 0.3   | 0.18   |
| †47.0   | D            | T493D476(1)025(2)(3)(4)(5) | 11.8                       | 10.0                             | 0.7  | 0.2   | 0.12   |
| †47.0   | X            | T493X476(1)025(2)(3)(4)(5) | 11.8                       | 6.0                              | 0.7  | 0.3   | 0.15   |

- (1) To complete KEMET part number, insert M for ±20% or K for ±10% capacitance tolerance. To request ±5% tolerance, contact KEMET sales representative.
  - (2) To complete KEMET part number, insert A for Non-ER; B for 0.1%/1000 Hrs.; or C for 0.01%/1000 Hrs. Reliability Level.
  - (3) To complete KEMET part number, insert B for Gold Plated (50 µ inch minimum); C for Hot Solder Dipped (60 µ inch minimum); H for Solder Plated (100 µ inch minimum); K for Solder Fused (60 µ inch minimum Termination Finish or T for 100% Tin.
  - (4) To complete KEMET part number for Surge Current testing, insert 61 for none; 62 for 10 cycles +25°C; or 64 for 10 cycles, -55°C & +85°C.
  - (5) To complete KEMET part number, insert 10 for Standard ESR; 20 for Low ESR or 30 for Ultra-low ESR Option.
- \* Extended Values #Maximum Capacitance Change @ 125°C = +15% † Maximum Capacitance Change @ 125°C = +20%

# SOLID TANTALUM CHIP CAPACITORS

## T493 SERIES—Military COTS

### T493 RATINGS AND PART NUMBER REFERENCE

| Capacitance<br>µF   | Case<br>Size | KEMET<br>Part Number       | DCL<br>µA @<br>25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | Std. ESR<br>Ohms<br>@+25°C<br>100 kHz<br>Max | Low ESR<br>Ohms<br>@+25°C<br>100 kHz<br>Max | Ultra-Low<br>ESR, Ohms<br>@+25°C<br>100 kHz<br>Max |
|---|--------------|----------------------------|----------------------------|----------------------------------|--|---|--|
| <b>35 Volt Rating at +85°C (23 Volt Rating at +125°C)</b> |              |                            |                            |                                  |  |   |  |
| 0.10  | A            | T493A104(1)035(2)(3)(4)(5) | 0.5                        | 4.0                              | 20.0   | 10.0  | N/A  |
| 0.15  | A            | T493A154(1)035(2)(3)(4)(5) | 0.5                        | 4.0                              | 19.0   | 6.0   | N/A  |
| 0.22  | A            | T493A224(1)035(2)(3)(4)(5) | 0.5                        | 4.0                              | 18.0   | 6.0   | N/A  |
| 0.33  | A            | T493A334(1)035(2)(3)(4)(5) | 0.5                        | 4.0                              | 15.0   | 6.0   | N/A  |
| 0.47  | A            | T493A474(1)035(2)(3)(4)(5) | 0.5                        | 4.0                              | 14.0   | 4.0   | N/A  |
| 0.47  | B            | T493B474(1)035(2)(3)(4)(5) | 0.5                        | 4.0                              | 8.0  | 2.5   | 1.5  |
| 0.68  | A            | T493A684(1)035(2)(3)(4)(5) | 0.5                        | 4.0                              | 10.0   | 6.0   | N/A  |
| 0.68  | B            | T493B684(1)035(2)(3)(4)(5) | 0.5                        | 4.0                              | 6.5  | 2.5   | N/A  |
| 1.0   | A            | T493A105(1)035(2)(3)(4)(5) | 0.5                        | 4.0                              | 10.0   | 6.0   | N/A  |
| 1.0   | B            | T493B105(1)035(2)(3)(4)(5) | 0.5                        | 4.0                              | 5.0  | 2.0   | 1.5  |
| 1.5   | B            | T493B155(1)035(2)(3)(4)(5) | 0.5                        | 6.0                              | 5.0  | 3.0   | N/A  |
| 1.5   | C            | T493C155(1)035(2)(3)(4)(5) | 0.5                        | 6.0                              | 4.5  | 2.5   | N/A  |
| 2.2   | B            | T493B225(1)035(2)(3)(4)(5) | 0.8                        | 6.0                              | 4.0  | 2.5   | 1.5  |
| 2.2   | C            | T493C225(1)035(2)(3)(4)(5) | 0.8                        | 6.0                              | 3.5  | 1.5   | 0.75   |
| #3.3  | B            | T493B335(1)035(2)(3)(4)(5) | 1.2                        | 6.0                              | 3.5  | 1.3   | N/A  |
| 3.3   | C            | T493C335(1)035(2)(3)(4)(5) | 1.2                        | 6.0                              | 2.5  | 0.8   | 0.60   |
| 4.7   | C            | T493C475(1)035(2)(3)(4)(5) | 1.7                        | 6.0                              | 2.5  | 0.6   | 0.45   |
| 4.7   | D            | T493D475(1)035(2)(3)(4)(5) | 1.7                        | 6.0                              | 1.5  | 0.7   | N/A  |
| 6.8   | C            | T493C685(1)035(2)(3)(4)(5) | 2.4                        | 6.0                              | 2.0  | 0.9   | N/A  |
| 6.8   | D            | T493D685(1)035(2)(3)(4)(5) | 2.4                        | 6.0                              | 1.3  | 0.5   | 0.40   |
| #10.0   | C            | T493C106(1)035(2)(3)(4)(5) | 3.5                        | 6.0                              | 2.0  | 1.2   | N/A  |
| 10.0  | D            | T493D106(1)035(2)(3)(4)(5) | 3.5                        | 6.0                              | 1.0  | 0.3   | 0.25   |
| 10.0  | X            | T493X106(1)035(2)(3)(4)(5) | 2.8                        | 4.0                              | 0.9  | 0.25  | 0.18   |
| 15.0  | D            | T493D156(1)035(2)(3)(4)(5) | 5.3                        | 6.0                              | 0.8  | 0.3   | 0.23   |
| 15.0  | X            | T493X156(1)035(2)(3)(4)(5) | 5.3                        | 6.0                              | 0.9  | 0.3   | 0.20   |
| #22.0   | D            | T493D226(1)035(2)(3)(4)(5) | 7.7                        | 6.0                              | 0.7  | 0.4   | 0.20   |
| 22.0  | X            | T493X226(1)035(2)(3)(4)(5) | 7.7                        | 6.0                              | 0.7  | 0.3   | 0.20   |
| #33.0   | X            | T493X336(1)035(2)(3)(4)(5) | 11.6                       | 6.0                              | 0.6  | 0.3   | 0.18   |
| #47.0   | E            | T493E476(1)035(2)(3)(4)(5) | 16.5                       | 10.0                             | 0.5  | 0.3   | N/A  |
| <b>50 Volt Rating at +85°C (33 Volt Rating at +125°C)</b> |              |                            |                            |                                  |  |   |  |
| 0.10  | A            | T493A104(1)050(2)(3)(4)(5) | 0.5                        | 4.0                              | 20.0   | 10.0  | N/A  |
| 0.15  | A            | T493A154(1)050(2)(3)(4)(5) | 0.5                        | 4.0                              | 19.0   | 10.0  | N/A  |
| 0.15  | B            | T493B154(1)050(2)(3)(4)(5) | 0.5                        | 4.0                              | 16.0   | 10.0  | N/A  |
| 0.22  | B            | T493B224(1)050(2)(3)(4)(5) | 0.5                        | 4.0                              | 14.0   | 10.0  | N/A  |
| 0.33  | B            | T493B334(1)050(2)(3)(4)(5) | 0.5                        | 4.0                              | 10.0   | 2.5   | N/A  |
| 0.47  | B            | T493B474(1)050(2)(3)(4)(5) | 0.5                        | 4.0                              | 9.0  | 2.0   | N/A  |
| 0.47  | C            | T493C474(1)050(2)(3)(4)(5) | 0.5                        | 4.0                              | 8.0  | 1.8   | N/A  |
| 0.68  | C            | T493C684(1)050(2)(3)(4)(5) | 0.5                        | 4.0                              | 7.0  | 1.6   | N/A  |
| 1.0   | C            | T493C105(1)050(2)(3)(4)(5) | 0.5                        | 4.0                              | 5.5  | 1.6   | 1.3  |
| 1.5   | C            | T493C155(1)050(2)(3)(4)(5) | 0.8                        | 6.0                              | 4.5  | 1.5   | N/A  |
| 1.5   | D            | T493D155(1)050(2)(3)(4)(5) | 0.8                        | 6.0                              | 3.5  | 1.0   | N/A  |
| 2.2   | C            | T493C225(1)050(2)(3)(4)(5) | 1.1                        | 6.0                              | 3.5  | 1.5   | N/A  |
| 2.2   | D            | T493D225(1)050(2)(3)(4)(5) | 1.1                        | 6.0                              | 2.5  | 0.8   | 0.60   |
| 3.3   | D            | T493D335(1)050(2)(3)(4)(5) | 1.7                        | 6.0                              | 2.0  | 0.8   | 0.70   |
| 4.7   | D            | T493D475(1)050(2)(3)(4)(5) | 2.4                        | 6.0                              | 1.5  | 0.6   | 0.28   |
| 4.7   | X            | T493X475(1)050(2)(3)(4)(5) | 1.9                        | 4.0                              | 0.9  | 0.3   | 0.30   |
| 6.8   | X            | T493X685(1)050(2)(3)(4)(5) | 3.5                        | 6.0                              | 1.0  | 0.5   | N/A  |
| 10.0  | X            | T493X106(1)050(2)(3)(4)(5) | 5.0                        | 6.0                              | 0.7  | 0.4   | N/A  |

- (1) To complete KEMET part number, insert M for ±20% or K for ±10% capacitance tolerance. To request ±5% tolerance, contact KEMET sales representative.
- (2) To complete KEMET part number, insert A for Non-ER; B for 0.1%/1000 Hrs.; or C for 0.01%/1000 Hrs. Reliability Level.
- (3) To complete KEMET part number, insert B for Gold Plated (50 µ inch minimum); C for Hot Solder Dipped (60 µ inch minimum); H for Solder Plated (100 µ inch minimum); K for Solder Fused (60 µ inch minimum Termination Finish or T for 100% Tin.
- (4) To complete KEMET part number for Surge Current testing, insert 61 for none; 62 for 10 cycles +25°C; or 64 for 10 cycles, -55°C & +85°C.
- (5) To complete KEMET part number, insert 10 for Standard ESR; 20 for Low ESR or 30 for Ultra-low ESR Option.

\* Extended Values #Maximum Capacitance Change @ 125°C = +15%

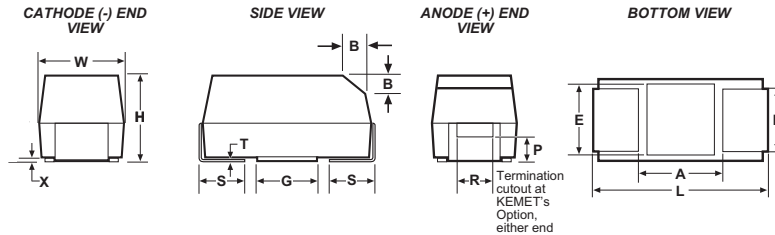


## T494 SERIES — Low ESR, Industrial Grade

### FEATURES

- Low ESR values in EIA 535BAAC sizes
- Taped and Reeled per EIA 481-1
- Symmetrical, Compliant Terminations
- Optional Gold-plated Terminations
- Laser-marked Case
- 100% Surge Current test on C, D, E, U, V, X sizes
- Capacitance: 0.1  $\mu$ F to 1000  $\mu$ F
- Tolerance:  $\pm 10\%$ ,  $\pm 20\%$
- Voltage: 3-50 VDC
- Extended Range Values
- Low Profile Case Sizes
- RoHS Compliant & Leadfree Terminations (See www.kemet.com for lead transition)
- Operating Temperature:  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$

### CAPACITOR OUTLINE DRAWING



### STANDARD T494 DIMENSIONS Millimeters (inches)

| Case Size |         | Component                           |                                     |                                     |                              |                              |   |                                       |               |               |                |               |               |               |
|-----------|---------|-------------------------------------|-------------------------------------|-------------------------------------|------------------------------|------------------------------|---|---------------------------------------|---------------|---------------|----------------|---------------|---------------|---------------|
| KEMET     | EIA     | L*                                  | W*                                  | H*                                  | F* $\pm 0.1$<br>$\pm (.004)$ | S* $\pm 0.3$<br>$\pm (.012)$ | B $\pm 0.15$<br>$(\text{Ref}) \pm .006$ | X<br>(Ref)                            | P<br>(Ref)    | R<br>(Ref)    | T<br>(Ref)     | A<br>(Min)    | G<br>(Ref)    | E<br>(Ref)    |
| A         | 3216-18 | 3.2 $\pm 0.2$<br>(.126 $\pm .008$ ) | 1.6 $\pm 0.2$<br>(.063 $\pm .008$ ) | 1.6 $\pm 0.2$<br>(.063 $\pm .008$ ) | 1.2<br>(.047)                | 0.8<br>(.031)                | 0.4<br>(.016)                           | 0.10 $\pm 0.10$<br>(.004 $\pm .004$ ) | 0.4<br>(.016) | 0.4<br>(.016) | 0.13<br>(.005) | 1.4<br>(.055) | 1.1<br>(.043) | 1.3<br>(.051) |
| B         | 3528-21 | 3.5 $\pm 0.2$<br>(.138 $\pm .008$ ) | 2.8 $\pm 0.2$<br>(.110 $\pm .008$ ) | 1.9 $\pm 0.2$<br>(.075 $\pm .008$ ) | 2.2<br>(.087)                | 0.8<br>(.031)                | 0.4<br>(.016)                           | 0.10 $\pm 0.10$<br>(.004 $\pm .004$ ) | 0.5<br>(.020) | 1.0<br>(.039) | 0.13<br>(.005) | 1.1<br>(.043) | 1.8<br>(.071) | 2.2<br>(.087) |
| C         | 6032-28 | 6.0 $\pm 0.3$<br>(.236 $\pm .012$ ) | 3.2 $\pm 0.3$<br>(.126 $\pm .012$ ) | 2.5 $\pm 0.3$<br>(.098 $\pm .012$ ) | 2.2<br>(.087)                | 1.3<br>(.051)                | 0.5<br>(.020)                           | 0.10 $\pm 0.10$<br>(.004 $\pm .004$ ) | 0.9<br>(.035) | 1.0<br>(.039) | 0.13<br>(.005) | 3.1<br>(.122) | 2.8<br>(.110) | 2.4<br>(.094) |
| D         | 7343-31 | 7.3 $\pm 0.3$<br>(.287 $\pm .012$ ) | 4.3 $\pm 0.3$<br>(.169 $\pm .012$ ) | 2.8 $\pm 0.3$<br>(.110 $\pm .012$ ) | 2.4<br>(.094)                | 1.3<br>(.051)                | 0.5<br>(.020)                           | 0.10 $\pm 0.10$<br>(.004 $\pm .004$ ) | 0.9<br>(.035) | 1.0<br>(.039) | 0.13<br>(.005) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |
| X         | 7343-43 | 7.3 $\pm 0.3$<br>(.287 $\pm .012$ ) | 4.3 $\pm 0.3$<br>(.169 $\pm .012$ ) | 4.0 $\pm 0.3$<br>(.157 $\pm .012$ ) | 2.4<br>(.094)                | 1.3<br>(.051)                | 0.5<br>(.020)                           | 0.10 $\pm 0.10$<br>(.004 $\pm .004$ ) | 1.7<br>(.067) | 1.0<br>(.039) | 0.13<br>(.005) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |
| E         | 7260-38 | 7.3 $\pm 0.3$<br>(.287 $\pm .012$ ) | 6.0 $\pm 0.3$<br>(.236 $\pm .012$ ) | 3.6 $\pm 0.2$<br>(.142 $\pm .008$ ) | 4.1<br>(.161)                | 1.3<br>(.051)                | 0.5<br>(.020)                           | 0.10 $\pm 0.10$<br>(.004 $\pm .004$ ) | 0.9<br>(.035) | 1.0<br>(.039) | 0.13<br>(.005) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |

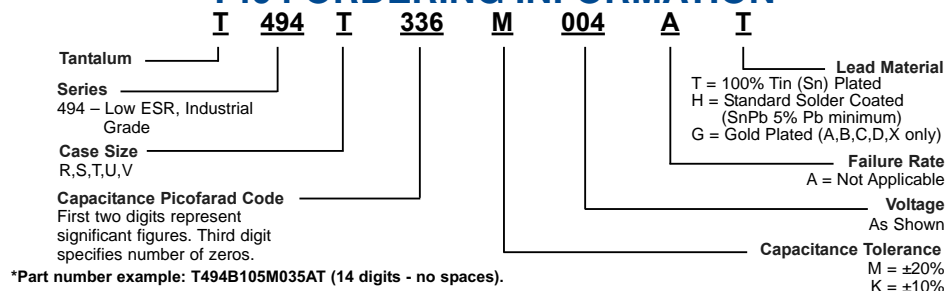
Notes: 1. Metric dimensions govern  
2. (Ref) Dimensions provided for reference only  
\* Mil-PRF-55365/8 Specified Dimensions

### LOW PROFILE T494 DIMENSIONS Millimeters (inches)

| Case Size |         | Component                           |                                     |               |                              |                              |                |                |               |               |               |  |
|-----------|---------|-------------------------------------|-------------------------------------|---------------|------------------------------|------------------------------|----------------|----------------|---------------|---------------|---------------|--|
| KEMET     | EIA     | L*                                  | W*                                  | H max         | F* $\pm 0.1$<br>$\pm (.004)$ | S* $\pm 0.3$<br>$\pm (.012)$ | X<br>(Ref)     | T<br>(Ref)     | A<br>(Min)    | G<br>(Ref)    | E<br>(Ref)    |  |
| R         | 2012-12 | 2.0 $\pm 0.2$<br>(.079 $\pm .008$ ) | 1.3 $\pm 0.2$<br>(.051 $\pm .008$ ) | 1.2<br>(.047) | 0.9<br>(.035)                | 0.5<br>(.020)                | 0.05<br>(.002) | 0.13<br>(.005) | 0.8<br>(.031) | 0.5<br>(.020) | 0.8<br>(.031) |  |
| S         | 3216-12 | 3.2 $\pm 0.2$<br>(.126 $\pm .008$ ) | 1.6 $\pm 0.2$<br>(.063 $\pm .008$ ) | 1.2<br>(.047) | 1.2<br>(.047)                | 0.8<br>(.031)                | 0.05<br>(.002) | 0.13<br>(.005) | 1.4<br>(.055) | 1.1<br>(.043) | 1.3<br>(.051) |  |
| T         | 3528-12 | 3.5 $\pm 0.2$<br>(.138 $\pm .008$ ) | 2.8 $\pm 0.2$<br>(.110 $\pm .008$ ) | 1.2<br>(.047) | 2.2<br>(.087)                | 0.8<br>(.031)                | 0.05<br>(.002) | 0.13<br>(.005) | 1.1<br>(.043) | 1.8<br>(.071) | 2.2<br>(.087) |  |
| U         | 6032-15 | 6.0 $\pm 0.3$<br>(.236 $\pm .012$ ) | 3.2 $\pm 0.3$<br>(.126 $\pm .012$ ) | 1.5<br>(.059) | 2.2<br>(.087)                | 1.3<br>(.051)                | 0.05<br>(.002) | 0.13<br>(.005) | 3.1<br>(.122) | 2.8<br>(.110) | 2.4<br>(.094) |  |
| V         | 7343-20 | 7.3 $\pm 0.3$<br>(.287 $\pm .012$ ) | 4.3 $\pm 0.3$<br>(.169 $\pm .012$ ) | 2.0<br>(.079) | 2.4<br>(.094)                | 1.3<br>(.051)                | 0.05<br>(.002) | 0.13<br>(.005) | 3.8<br>(.150) | 3.8<br>(.150) | 3.5<br>(.138) |  |

Notes: 1. Metric dimensions govern  
2. (Ref) Dimensions provided for reference only  
3. No dimensions provided for B,P or R because low profile cases do not have a bevel or a notch.

### T494 ORDERING INFORMATION



Solid Tantalum Surface Mount

### T494 RATINGS & PART NUMBER REFERENCE

| Capacitance<br>µF   | Case<br>Size | KEMET<br>Part Number | DC<br>Leakage<br>µA @ 25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | ESR Ω<br>@ +25°C<br>100 kHz<br>Max |
|---|--------------|----------------------|-----------------------------------|----------------------------------|------------------------------------|
| <b>2.5 Volt Rating at +85°C (1.7 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 100.0   | T            | T494T107(1)2R5A(2)   | 2.5                               | 24.0                             | 3.5                                |
| 220.0   | D            | T494D227(1)2R5A(2)   | 5.5                               | 8.0                              | 0.2                                |
| <b>3 Volt Rating at +85°C (2 Volt Rating at +125°C)</b>     |              |                      |                                   |                                  |                                    |
| #33.0   | A            | T494A336(1)003A(2)   | 1.0                               | 6.0                              | 2.0                                |
| <b>4 Volt Rating at +85°C (2.7 Volt Rating at +125°C)</b>   |              |                      |                                   |                                  |                                    |
| 3.3   | A            | T494A335(1)004A(2)   | 0.5                               | 6.0                              | 4.0                                |
| 4.7   | A            | T494A475(1)004A(2)   | 0.5                               | 6.0                              | 3.5                                |
| 6.8   | A            | T494A685(1)004A(2)   | 0.5                               | 6.0                              | 3.0                                |
| 6.8   | S            | T494S685(1)004A(2)   | 0.5                               | 6.0                              | 7.0                                |
| 10.0  | B            | T494B106(1)004A(2)   | 0.5                               | 6.0                              | 1.2                                |
| 10.0  | A            | T494A106(1)004A(2)   | 0.5                               | 6.0                              | 2.0                                |
| #10.0   | S            | T494S106(1)004A(2)   | 0.5                               | 6.0                              | 9.0                                |
| #10.0   | R            | T494R106M004A(2)     | 0.5                               | 8.0                              | 6.0                                |
| 15.0  | B            | T494B156(1)004A(2)   | 0.6                               | 6.0                              | 1.2                                |
| 15.0  | A            | T494A156(1)004A(2)   | 0.6                               | 6.0                              | 1.5                                |
| 15.0  | T            | T494T156(1)004A(2)   | 0.6                               | 6.0                              | 2.0                                |
| #15.0   | S            | T494S156M004A(2)     | 0.6                               | 10.0                             | 9.0                                |
| 22.0  | C            | T494C226(1)004A(2)   | 0.9                               | 6.0                              | 0.5                                |
| 22.0  | B            | T494B226(1)004A(2)   | 0.9                               | 6.0                              | 0.6                                |
| #22.0   | A            | T494A226(1)004A(2)   | 0.9                               | 6.0                              | 1.5                                |
| #22.0   | S            | T494S226M004A(2)     | 0.9                               | 10.0                             | 8.0                                |
| #22.0   | T            | T494T226(1)004A(2)   | 0.9                               | 6.0                              | 2.5                                |
| 33.0  | C            | T494C336(1)004A(2)   | 1.3                               | 6.0                              | 0.5                                |
| 33.0  | U            | T494U336(1)004A(2)   | 1.3                               | 6.0                              | 0.6                                |
| 33.0  | B            | T494B336(1)004A(2)   | 1.3                               | 6.0                              | 0.5                                |
| #33.0   | A            | T494A336(1)004A(2)   | 1.3                               | 6.0                              | 3.0                                |
| #33.0   | T            | T494T336M004A(2)     | 1.3                               | 8.0                              | 3.5                                |
| 47.0  | C            | T494C476(1)004A(2)   | 1.9                               | 6.0                              | 0.5                                |
| 47.0  | U            | T494U476(1)004A(2)   | 1.9                               | 6.0                              | 0.6                                |
| #47.0   | B            | T494B476(1)004A(2)   | 1.9                               | 6.0                              | 0.5                                |
| #47.0   | A            | T494A476M004A(2)     | 1.9                               | 12.0                             | 2.0                                |
| #47.0   | T            | T494T476M004A(2)     | 1.9                               | 12.0                             | 4.0                                |
| 68.0  | D            | T494D686(1)004A(2)   | 2.7                               | 6.0                              | 0.20                               |
| 68.0  | C            | T494C686(1)004A(2)   | 2.7                               | 6.0                              | 0.25                               |
| #68.0   | U            | T494U686(1)004A(2)   | 2.7                               | 6.0                              | 0.60                               |
| #68.0   | B            | T494B686(1)004A(2)   | 2.7                               | 6.0                              | 2.00                               |
| #68.0   | A            | T494A686(1)004A(2)   | 2.8                               | 30.0                             | 3.00                               |
| 100.0   | D            | T494D107(1)004A(2)   | 4.0                               | 8.0                              | 0.20                               |
| #100.0  | C            | T494C107(1)004A(2)   | 4.0                               | 8.0                              | 0.20                               |
| #100.0  | U            | T494U107(1)004A(2)   | 4.0                               | 10.0                             | 1.00                               |
| #100.0  | B            | T494B107M004A(2)     | 4.0                               | 8.0                              | 0.65                               |
| †100.0  | A            | T494A107M004A(2)     | 4.0                               | 30.0                             | 3.00                               |
| †100.0  | T            | T494T107M004A(2)     | 4.0                               | 30.0                             | 4.50                               |
| 150.0   | D            | T494D157(1)004A(2)   | 6.0                               | 8.0                              | 0.15                               |
| 150.0   | V            | T494V157(1)004A(2)   | 6.0                               | 8.0                              | 0.20                               |
| #150.0  | C            | T494C157(1)004A(2)   | 6.0                               | 8.0                              | 0.30                               |
| †150.0  | B            | T494B157M004A(2)     | 6.0                               | 12.0                             | 1.00                               |
| #220.0  | V            | T494V227(1)004A(2)   | 8.8                               | 8.0                              | 0.30                               |
| #220.0  | B            | T494B227M004A(2)     | 8.8                               | 8.0                              | 0.40                               |
| #330.0  | D            | T494D337(1)004A(2)   | 13.2                              | 8.0                              | 0.15                               |
| #330.0  | C            | T494C337(1)004A(2)   | 13.2                              | 10.0                             | 0.09                               |
| †330.0  | V            | T494V337(1)004A(2)   | 13.2                              | 12.0                             | 0.30                               |
| #470.0  | X            | T494X477(1)004A(2)   | 18.8                              | 8.0                              | 0.15                               |
| #470.0  | D            | T494D477(1)004A(2)   | 18.8                              | 8.0                              | 0.15                               |
| #680.0  | X            | T494X687M004A(2)     | 27.2                              | 12.0                             | 0.10                               |
| #680.0  | D            | T494D687M004A(2)     | 27.2                              | 12.0                             | 0.15                               |
| #1000.0   | X            | T494X108(1)004A(2)   | 40.0                              | 12.0                             | 0.10                               |
| #1000.0   | E            | T494E108M004A(2)     | 40.0                              | 15.0                             | 0.08                               |
| <b>**6.3 Volt Rating at +85°C (4 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 2.2   | R            | T494R225(1)006A(2)   | 0.5                               | 6.0                              | 20.0                               |
| 2.2   | A            | T494A225(1)006A(2)   | 0.5                               | 6.0                              | 6.0                                |
| 3.3   | A            | T494A335(1)006A(2)   | 0.5                               | 6.0                              | 6.0                                |
| 4.7   | A            | T494A475(1)006A(2)   | 0.5                               | 6.0                              | 3.5                                |
| 4.7   | S            | T494S475(1)006A(2)   | 0.5                               | 6.0                              | 8.0                                |
| 6.8   | B            | T494B685(1)006A(2)   | 0.5                               | 6.0                              | 1.2                                |
| 6.8   | A            | T494A685(1)006A(2)   | 0.5                               | 6.0                              | 2.0                                |
| #6.8  | S            | T494S685(1)006A(2)   | 0.5                               | 6.0                              | 9.0                                |
| #6.8  | R            | T494R685(1)006A(2)   | 0.5                               | 8.0                              | 10.0                               |
| 10.0  | B            | T494B106(1)006A(2)   | 0.6                               | 6.0                              | 1.0                                |
| 10.0  | A            | T494A106(1)006A(2)   | 0.6                               | 6.0                              | 2.0                                |
| 10.0  | T            | T494T106(1)006A(2)   | 0.6                               | 6.0                              | 1.2                                |
| #10.0   | S            | T494S106M006A(2)     | 0.6                               | 10.0                             | 9.0                                |
| #10.0   | R            | T494R106M006A(2)     | 0.6                               | 8.0                              | 6.0                                |

| Capacitance<br>µF   | Case<br>Size | KEMET<br>Part Number | DC<br>Leakage<br>µA @ 25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | ESR Ω<br>@ +25°C<br>100 kHz<br>Max |
|---|--------------|----------------------|-----------------------------------|----------------------------------|------------------------------------|
| <b>**6.3 Volt Rating at +85°C (4 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 15.0  | C            | T494C156(1)006A(2)   | 0.9                               | 6.0                              | 0.6                                |
| 15.0  | B            | T494B156(1)006A(2)   | 0.9                               | 6.0                              | 0.7                                |
| #15.0   | A            | T494A156(1)006A(2)   | 0.9                               | 6.0                              | 2.0                                |
| #15.0   | T            | T494T156(1)006A(2)   | 0.9                               | 6.0                              | 2.5                                |
| #15.0   | S            | T494S156M006A(2)     | 0.9                               | 10.0                             | 10.0                               |
| 22.0  | C            | T494C226(1)006A(2)   | 1.4                               | 6.0                              | 0.5                                |
| 22.0  | U            | T494U226(1)006A(2)   | 1.4                               | 6.0                              | 0.8                                |
| 22.0  | B            | T494B226(1)006A(2)   | 1.4                               | 6.0                              | 0.6                                |
| #22.0   | A            | T494A226(1)006A(2)   | 1.4                               | 6.0                              | 3.0                                |
| #22.0   | T            | T494T226M006A(2)     | 1.4                               | 8.0                              | 3.5                                |
| 33.0  | C            | T494C336(1)006A(2)   | 2.0                               | 6.0                              | 0.3                                |
| 33.0  | U            | T494U336(1)006A(2)   | 2.0                               | 6.0                              | 0.6                                |
| #33.0   | B            | T494B336(1)006A(2)   | 2.0                               | 6.0                              | 0.6                                |
| #33.0   | A            | T494A336(1)006A(2)   | 2.0                               | 12.0                             | 2.0                                |
| #33.0   | T            | T494T336M006A(2)     | 2.0                               | 12.0                             | 4.0                                |
| 47.0  | D            | T494D476(1)006A(2)   | 2.9                               | 6.0                              | 0.22                               |
| 47.0  | C            | T494C476(1)006A(2)   | 2.9                               | 6.0                              | 0.25                               |
| #47.0   | U            | T494U476(1)006A(2)   | 2.9                               | 6.0                              | 0.60                               |
| #47.0   | B            | T494B476(1)006A(2)   | 2.9                               | 6.0                              | 0.50                               |
| †47.0   | A            | T494A476M006A(2)     | 3.0                               | 12.0                             | 2.50                               |
| 47.0  | T            | T494T476(1)006A(2)   | 3.0                               | 24.0                             | 4.00                               |
| 68.0  | D            | T494D686(1)006A(2)   | 4.1                               | 6.0                              | 0.20                               |
| #68.0   | C            | T494C686(1)006A(2)   | 4.1                               | 6.0                              | 0.20                               |
| #68.0   | U            | T494U686(1)006A(2)   | 4.1                               | 10.0                             | 1.00                               |
| #68.0   | B            | T494B686M006A(2)     | 4.1                               | 8.0                              | 0.65                               |
| #68.0   | A            | T494A686(1)006A(2)   | 5.0                               | 30.0                             | 3.00                               |
| 100.0   | D            | T494D107(1)006A(2)   | 6.0                               | 8.0                              | 0.15                               |
| 100.0   | V            | T494V107(1)006A(2)   | 6.0                               | 8.0                              | 0.20                               |
| #100.0  | C            | T494C107(1)006A(2)   | 6.0                               | 8.0                              | 0.30                               |
| #100.0  | U            | T494U107M006A(2)     | 6.0                               | 10.0                             | 1.20                               |
| #100.0  | B            | T494B107(1)006A(2)   | 6.0                               | 15.0                             | 1.50                               |
| 150.0   | D            | T494D157(1)006A(2)   | 9.0                               | 8.0                              | 0.15                               |
| #150.0  | C            | T494C157M006A(2)     | 9.0                               | 8.0                              | 0.30                               |
| #150.0  | V            | T494V157(1)006A(2)   | 9.0                               | 8.0                              | 0.30                               |
| 220.0   | X            | T494X227(1)006A(2)   | 13.2                              | 8.0                              | 0.15                               |
| #220.0  | D            | T494D227(1)006A(2)   | 13.2                              | 8.0                              | 0.15                               |
| #220.0  | C            | T494C227M006A(2)     | 13.2                              | 10.0                             | 0.30                               |
| #220.0  | V            | T494V227M006A(2)     | 13.2                              | 12.0                             | 0.30                               |
| #330.0  | X            | T494X337(1)006A(2)   | 19.8                              | 8.0                              | 0.15                               |
| #330.0  | D            | T494D337(1)006A(2)   | 19.8                              | 8.0                              | 0.15                               |
| #330.0  | E            | T494E337(1)006A(2)   | 20.8                              | 8.0                              | 0.25                               |
| #470.0  | X            | T494X477(1)006A(2)   | 28.2                              | 10.0                             | 0.10                               |
| #470.0  | D            | T494D477M006A(2)     | 28.2                              | 12.0                             | 0.15                               |
| #470.0  | E            | T494E477(1)006A(2)   | 29.6                              | 10.0                             | 0.20                               |
| #680.0  | E            | T494E687M006A(2)     | 40.8                              | 12.0                             | 0.10                               |
| <b>10 Volt Rating at +85°C (7 Volt Rating at +125°C)</b>    |              |                      |                                   |                                  |                                    |
| 1.5   | A            | T494A155(1)010A(2)   | 0.5                               | 6.0                              | 6.0                                |
| 2.2   | B            | T494B225(1)010A(2)   | 0.5                               | 6.0                              | 1.5                                |
| 2.2   | A            | T494A225(1)010A(2)   | 0.5                               | 6.0                              | 6.0                                |
| 3.3   | A            | T494A335(1)010A(2)   | 0.5                               | 6.0                              | 4.0                                |
| 3.3   | S            | T494S335(1)010A(2)   | 0.5                               | 6.0                              | 9.0                                |
| #3.3  | R            | T494R335(1)010A(2)   | 0.3                               | 8.0                              | 10.0                               |
| 4.7   | B            | T494B475(1)010A(2)   | 0.5                               | 6.0                              | 1.5                                |
| 4.7   | A            | T494A475(1)010A(2)   | 0.5                               | 6.0                              | 3.0                                |
| #4.7  | S            | T494S475(1)010A(2)   | 0.5                               | 6.0                              | 9.0                                |
| #4.7  | R            | T494R475M010A(2)     | 0.5                               | 8.0                              | 8.0                                |
| 6.8   | B            | T494B685(1)010A(2)   | 0.7                               | 6.0                              | 1.2                                |
| 6.8   | A            | T494A685(1)010A(2)   | 0.7                               | 6.0                              | 3.0                                |
| 6.8   | T            | T494T685(1)010A(2)   | 0.7                               | 6.0                              | 2.0                                |
| #6.8  | S            | T494S685M010A(2)     | 0.7                               | 10.0                             | 9.0                                |
| 10.0  | C            | T494C106(1)010A(2)   | 1.0                               | 6.0                              | 0.6                                |
| 10.0  | B            | T494B106(1)010A(2)   | 1.0                               | 6.0                              | 0.8                                |
| #10.0   | A            | T494A106(1)010A(2)   | 1.0                               | 6.0                              | 1.8                                |
| #10.0   | T            | T494T106(1)010A(2)   | 1.0                               | 6.0                              | 3.5                                |
| #10.0   | S            | T494S106M010A(2)     | 1.0                               | 10.0                             | 12.0                               |
| 15.0  | C            | T494C156(1)010A(2)   | 1.5                               | 6.0                              | 0.5                                |
| 15.0  | U            | T494U156(1)010A(2)   | 1.5                               | 6.0                              | 0.8                                |
| 15.0  | B            | T494B156(1)010A(2)   | 1.5                               | 6.0                              | 0.7                                |
| #15.0   | A            | T494A156(1)010A(2)   | 1.5                               | 8.0                              | 4.0                                |
| #15.0   | T            | T494T156M010A(2)     | 1.5                               | 8.0                              | 3.5                                |

(1) To complete KEMET Part Number, insert M for ±20% tolerance or K for ±10% tolerance.  
 (2) To complete KEMET Part Number, insert H, G, or T lead material designation as shown on page 27.  
 \*Extended Values

\*\*6 Volt product equivalent to 6.3 volt product.  
 #Maximum Capacitance Change @ 125°C=+15%.  
 †Maximum Capacitance Change @ 125°C=+20%.

Higher voltage ratings and tighter tolerance product may be substituted within the same size at KEMET's option.  
 Voltage substitutions will be marked with the higher voltage rating.

### T494 RATINGS & PART NUMBER REFERENCE

Solid Tantalum Surface Mount

| Capacitance<br>µF   | Case Size | KEMET Part Number  | DC Leakage<br>µA @ 25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | ESR Ω<br>@ +25°C<br>100 kHz<br>Max |
|---|-----------|--------------------|--------------------------------|----------------------------------|------------------------------------|
| <b>10 Volt Rating at +85°C (7 Volt Rating at +125°C)</b>  |           |                    |                                |                                  |                                    |
| 22.0  | C         | T494C226(1)010A(2) | 2.2                            | 6.0                              | 0.4                                |
| 22.0  | U         | T494U226(1)010A(2) | 2.2                            | 6.0                              | 0.8                                |
| #22.0   | B         | T494B226(1)010A(2) | 2.2                            | 6.0                              | 0.7                                |
| #22.0   | A         | T494A226M010A(2)   | 2.2                            | 10.0                             | 4.5                                |
| #22.0   | T         | T494T226M010A(2)   | 2.2                            | 12.0                             | 6.0                                |
| 33.0  | D         | T494D336(1)010A(2) | 3.3                            | 6.0                              | 0.25                               |
| 33.0  | V         | T494V336(1)010A(2) | 3.3                            | 6.0                              | 0.30                               |
| 33.0  | C         | T494C336(1)010A(2) | 3.3                            | 6.0                              | 0.30                               |
| #33.0   | U         | T494U336(1)010A(2) | 3.3                            | 6.0                              | 0.60                               |
| #33.0   | T         | T494T336(1)010A(2) | 3.3                            | 24.0                             | 3.75                               |
| #33.0   | B         | T494B336(1)010A(2) | 3.3                            | 6.0                              | 1.40                               |
| #33.0   | A         | T494A336(1)010A(2) | 3.3                            | 15.0                             | 4.00                               |
| 47.0  | D         | T494D476(1)010A(2) | 4.7                            | 6.0                              | 0.22                               |
| 47.0  | V         | T494V476(1)010A(2) | 4.7                            | 6.0                              | 0.30                               |
| #47.0   | C         | T494C476(1)010A(2) | 4.7                            | 6.0                              | 0.30                               |
| #47.0   | U         | T494U476(1)010A(2) | 4.7                            | 10.0                             | 1.20                               |
| #47.0   | B         | T494B476M010A(2)   | 4.7                            | 8.0                              | 0.65                               |
| 68.0  | D         | T494D686(1)010A(2) | 6.8                            | 6.0                              | 0.20                               |
| #68.0   | C         | T494C686(1)010A(2) | 6.8                            | 6.0                              | 0.30                               |
| 68.0  | V         | T494V686(1)010A(2) | 6.8                            | 6.0                              | 0.30                               |
| #68.0   | U         | T494U686M010A(2)   | 6.8                            | 10.0                             | 1.20                               |
| #68.0   | B         | T494B686M010A(2)   | 6.8                            | 10.0                             | 1.50                               |
| 100.0   | D         | T494D107(1)010A(2) | 10.0                           | 8.0                              | 0.15                               |
| #100.0  | C         | T494C107(1)010A(2) | 10.0                           | 8.0                              | 0.20                               |
| #100.0  | V         | T494V107(1)010A(2) | 10.0                           | 8.0                              | 0.40                               |
| 150.0   | X         | T494X157(1)010A(2) | 15.0                           | 8.0                              | 0.15                               |
| #150.0  | D         | T494D157(1)010A(2) | 15.0                           | 8.0                              | 0.15                               |
| #150.0  | C         | T494C157(1)010A(2) | 15.0                           | 10.0                             | 0.70                               |
| #150.0  | V         | T494V157M010A(2)   | 15.0                           | 8.0                              | 0.30                               |
| #220.0  | X         | T494X227(1)010A(2) | 22.0                           | 8.0                              | 0.15                               |
| #220.0  | D         | T494D227(1)010A(2) | 22.0                           | 8.0                              | 0.15                               |
| #330.0  | X         | T494X337(1)010A(2) | 33.0                           | 10.0                             | 0.10                               |
| #330.0  | D         | T494D337M010A(2)   | 33.0                           | 10.0                             | 0.15                               |
| #330.0  | E         | T494E337(1)010A(2) | 33.0                           | 10.0                             | 0.25                               |
| #470.0  | X         | T494X477M010A(2)   | 47.0                           | 10.0                             | 0.10                               |
| #470.0  | E         | T494E477M010A(2)   | 47.0                           | 12.0                             | 0.10                               |
| <b>16 Volt Rating at +85°C (10 Volt Rating at +125°C)</b> |           |                    |                                |                                  |                                    |
| 1.0   | A         | T494A105(1)016A(2) | 0.5                            | 4.0                              | 6.0                                |
| 1.5   | A         | T494A155(1)016A(2) | 0.5                            | 6.0                              | 6.0                                |
| 2.2   | A         | T494A225(1)016A(2) | 0.5                            | 6.0                              | 4.0                                |
| 2.2   | S         | T494S225(1)016A(2) | 0.5                            | 6.0                              | 10.0                               |
| #2.2  | R         | T494R225(1)016A(2) | 0.5                            | 8.0                              | 20.0                               |
| 3.3   | B         | T494B335(1)016A(2) | 0.5                            | 6.0                              | 2.0                                |
| 3.3   | A         | T494A335(1)016A(2) | 0.5                            | 6.0                              | 4.0                                |
| 4.7   | B         | T494B475(1)016A(2) | 0.8                            | 6.0                              | 1.5                                |
| 4.7   | A         | T494A475(1)016A(2) | 0.8                            | 6.0                              | 3.0                                |
| 4.7   | T         | T494T475(1)016A(2) | 0.8                            | 6.0                              | 3.0                                |
| 6.8   | C         | T494C685(1)016A(2) | 1.1                            | 6.0                              | 0.8                                |
| 6.8   | B         | T494B685(1)016A(2) | 1.1                            | 6.0                              | 1.2                                |
| #6.8  | A         | T494A685(1)016A(2) | 1.1                            | 6.0                              | 3.0                                |
| 10.0  | C         | T494C106(1)016A(2) | 1.6                            | 6.0                              | 0.6                                |
| 10.0  | U         | T494U106(1)016A(2) | 1.6                            | 6.0                              | 1.0                                |
| 10.0  | B         | T494B106(1)016A(2) | 1.6                            | 6.0                              | 0.8                                |
| #10.0   | A         | T494A106(1)016A(2) | 1.6                            | 8.0                              | 3.0                                |
| #10.0   | T         | T494T106(1)016A(2) | 1.6                            | 8.0                              | 6.0                                |
| 15.0  | C         | T494C156(1)016A(2) | 2.4                            | 6.0                              | 0.4                                |
| 15.0  | U         | T494U156(1)016A(2) | 2.4                            | 6.0                              | 0.8                                |
| #15.0   | B         | T494B156(1)016A(2) | 2.4                            | 6.0                              | 0.8                                |
| 22.0  | D         | T494D226(1)016A(2) | 3.6                            | 6.0                              | 0.25                               |
| 22.0  | C         | T494C226(1)016A(2) | 3.6                            | 6.0                              | 0.35                               |
| #22.0   | U         | T494U226(1)016A(2) | 3.6                            | 10.0                             | 1.80                               |
| #22.0   | B         | T494B226(1)016A(2) | 3.6                            | 6.0                              | 1.00                               |
| 33.0  | D         | T494D336(1)016A(2) | 5.3                            | 6.0                              | 0.25                               |
| #33.0   | C         | T494C336(1)016A(2) | 5.3                            | 6.0                              | 0.30                               |
| #33.0   | U         | T494U336(1)016A(2) | 5.3                            | 12.0                             | 2.20                               |
| 47.0  | D         | T494D476(1)016A(2) | 7.5                            | 6.0                              | 0.2                                |
| 47.0  | V         | T494V476(1)016A(2) | 7.5                            | 6.0                              | 0.3                                |
| #47.0   | C         | T494C476(1)016A(2) | 7.5                            | 6.0                              | 0.5                                |
| 68.0  | D         | T494D686(1)016A(2) | 10.9                           | 6.0                              | 0.15                               |
| #68.0   | V         | T494V686(1)016A(2) | 10.9                           | 6.0                              | 0.5                                |
| #68.0   | C         | T494C686(1)016A(2) | 10.9                           | 12.0                             | 1.0                                |

| Capacitance<br>µF   | Case Size | KEMET Part Number   | DC Leakage<br>µA @ 25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | ESR Ω<br>@ +25°C<br>100 kHz<br>Max |
|---|-----------|---------------------|--------------------------------|----------------------------------|------------------------------------|
| <b>16 Volt Rating at +85°C (10 Volt Rating at +125°C)</b> |           |                     |                                |                                  |                                    |
| 100.0   | X         | T494X107(1)016A(2)  | 16.0                           | 8.0                              | 0.15                               |
| #100.0  | D         | T494D107(1)016A(2)  | 16.0                           | 8.0                              | 0.15                               |
| †100.0  | V         | T494V107(1)016A(2)  | 16.0                           | 12.0                             | 0.5                                |
| #150.0  | X         | T494X157(1)016A(2)  | 24.0                           | 8.0                              | 0.15                               |
| #150.0  | D         | T494D157(1)016A(2)  | 24.0                           | 12.0                             | 0.4                                |
| #220.0  | X         | T494X227(1)016A(2)  | 35.2                           | 10.0                             | 0.4                                |
| #220.0  | E         | T494E227(1)016A(2)  | 35.2                           | 7.2                              | 0.5                                |
| <b>20 Volt Rating at +85°C (13 Volt Rating at +125°C)</b> |           |                     |                                |                                  |                                    |
| 0.68  | A         | T494A684(1)020A(2)  | 0.5                            | 4.0                              | 8.0                                |
| 1.0   | A         | T494A105(1)020A(2)  | 0.5                            | 4.0                              | 5.5                                |
| 1.0   | S         | T494S105(1)020A(2)  | 0.5                            | 6.0                              | 10.0                               |
| †1.0  | R         | T494R105(1)020A(2)  | 0.2                            | 6.0                              | 15.0                               |
| 1.5   | A         | T494A155(1)020AS(2) | 0.5                            | 6.0                              | 4.5                                |
| 1.5   | S         | T494S155(1)020A(2)  | 0.5                            | 6.0                              | 9.0                                |
| 2.2   | B         | T494B225(1)020A(2)  | 0.5                            | 6.0                              | 1.5                                |
| 2.2   | A         | T494A225(1)020A(2)  | 0.5                            | 6.0                              | 4.0                                |
| 2.2   | R         | T494R225(1)020A(2)  | 0.4                            | 8.0                              | 6.0                                |
| 3.3   | B         | T494B335(1)020A(2)  | 0.7                            | 6.0                              | 1.3                                |
| #3.3  | A         | T494A335(1)020A(2)  | 0.7                            | 6.0                              | 4.0                                |
| 3.3   | T         | T494T335(1)020A(2)  | 0.7                            | 6.0                              | 4.0                                |
| 4.7   | C         | T494C475(1)020A(2)  | 1.0                            | 6.0                              | 0.6                                |
| 4.7   | B         | T494B475(1)020A(2)  | 1.0                            | 6.0                              | 1.0                                |
| #4.7  | A         | T494A475(1)020A(2)  | 1.0                            | 6.0                              | 3.0                                |
| 6.8   | C         | T494C685(1)020A(2)  | 1.4                            | 6.0                              | 0.6                                |
| 6.8   | U         | T494U685(1)020A(2)  | 1.4                            | 6.0                              | 1.4                                |
| #6.8  | B         | T494B685(1)020A(2)  | 1.4                            | 6.0                              | 1.0                                |
| #6.8  | A         | T494A685M020A(2)    | 1.4                            | 8.0                              | 3.0                                |
| 10.0  | C         | T494C106(1)020A(2)  | 2.0                            | 6.0                              | 0.5                                |
| 10.0  | U         | T494U106(1)020A(2)  | 2.0                            | 6.0                              | 0.8                                |
| #10.0   | B         | T494B106(1)020A(2)  | 2.0                            | 6.0                              | 1.0                                |
| #10.0   | A         | T494A106M020A(2)    | 2.0                            | 10.0                             | 3.0                                |
| 15.0  | D         | T494D156(1)020A(2)  | 3.0                            | 6.0                              | 0.35                               |
| 15.0  | C         | T494C156(1)020A(2)  | 3.0                            | 6.0                              | 0.40                               |
| 22.0  | D         | T494D226(1)020A(2)  | 4.4                            | 6.0                              | 0.3                                |
| 22.0  | V         | T494V226(1)020A(2)  | 4.4                            | 6.0                              | 0.4                                |
| #22.0   | C         | T494C226(1)020A(2)  | 4.4                            | 6.0                              | 0.4                                |
| #22.0   | B         | T494B226(1)020A(2)  | 4.4                            | 8.0                              | 3.0                                |
| 33.0  | D         | T494D336(1)020A(2)  | 6.6                            | 6.0                              | 0.25                               |
| #33.0   | C         | T494C336M020A(2)    | 6.6                            | 6.0                              | 0.40                               |
| †33.0   | V         | T494V336(1)020A(2)  | 6.6                            | 8.0                              | 0.40                               |
| 47.0  | C         | T494C476M020A(2)    | 9.4                            | 10.0                             | 0.80                               |
| 47.0  | D         | T494D476(1)020A(2)  | 9.4                            | 6.0                              | 0.20                               |
| 68.0  | X         | T494X686(1)020A(2)  | 13.6                           | 6.0                              | 0.20                               |
| #68.0   | D         | T494D686(1)020A(2)  | 13.6                           | 8.0                              | 0.20                               |
| #100.0  | X         | T494X107(1)020A(2)  | 20.0                           | 8.0                              | 0.15                               |
| #100.0  | E         | T494E107(1)020A(2)  | 20.0                           | 8.0                              | 0.30                               |
| #150.0  | X         | T494X157(1)020A(2)  | 30.0                           | 10.0                             | 0.30                               |
| <b>25 Volt Rating at +85°C (17 Volt Rating at +125°C)</b> |           |                     |                                |                                  |                                    |
| 0.33  | A         | T494A334(1)025A(2)  | 0.5                            | 4.0                              | 10.0                               |
| 0.47  | A         | T494A474(1)025A(2)  | 0.5                            | 4.0                              | 9.0                                |
| 0.68  | A         | T494A684(1)025A(2)  | 0.5                            | 4.0                              | 6.0                                |
| 1.0   | B         | T494B105(1)025A(2)  | 0.5                            | 4.0                              | 2.0                                |
| 1.0   | A         | T494A105(1)025A(2)  | 0.5                            | 4.0                              | 4.0                                |
| 1.5   | B         | T494B155(1)025A(2)  | 0.5                            | 6.0                              | 1.5                                |
| 1.5   | A         | T494A155(1)025A(2)  | 0.5                            | 6.0                              | 3.0                                |
| 1.5   | R         | T494R155(1)025A(2)  | 0.4                            | 8.0                              | 6.0                                |
| 2.2   | C         | T494C225(1)025A(2)  | 0.6                            | 6.0                              | 2.2                                |
| 2.2   | B         | T494B225(1)025A(2)  | 0.6                            | 6.0                              | 1.2                                |
| 3.3   | C         | T494C335(1)025A(2)  | 0.9                            | 6.0                              | 1.2                                |
| 3.3   | B         | T494B335(1)025A(2)  | 0.9                            | 6.0                              | 2.0                                |
| 4.7   | C         | T494C475(1)025A(2)  | 1.2                            | 6.0                              | 0.6                                |
| #4.7  | B         | T494B475(1)025A(2)  | 1.2                            | 6.0                              | 1.0                                |
| #4.7  | A         | T494A475M025A(2)    | 1.2                            | 8.0                              | 3.0                                |
| 6.8   | C         | T494C685(1)025A(2)  | 1.7                            | 6.0                              | 0.6                                |
| 6.8   | B         | T494B685(1)025A(2)  | 1.7                            | 8.0                              | 2.0                                |
| 10.0  | D         | T494D106(1)025A(2)  | 2.5                            | 6.0                              | 0.4                                |
| 10.0  | C         | T494C106(1)025A(2)  | 2.5                            | 6.0                              | 0.6                                |
| 10.0  | B         | T494B106(1)025A(2)  | 2.5                            | 8.0                              | 3.0                                |
| 15.0  | D         | T494D156(1)025A(2)  | 3.8                            | 6.0                              | 0.35                               |
| #15.0   | C         | T494C156(1)025A(2)  | 3.8                            | 6.0                              | 0.90                               |
| #15.0   | B         | T494B156(1)025A(2)  | 3.8                            | 8.0                              | 3.00                               |
| 22.0  | D         | T494D226(1)025A(2)  | 5.5                            | 6.0                              | 0.3                                |
| 22.0  | C         | T494C226(1)025A(2)  | 5.5                            | 6.0                              | 1.0                                |
| 22.0  | V         | T494V226(1)025A(2)  | 5.5                            | 6.0                              | 0.5                                |
| 33.0  | X         | T494X336(1)025A(2)  | 8.3                            | 6.0                              | 0.3                                |
| #33.0   | D         | T494D336(1)025A(2)  | 8.3                            | 6.0                              | 0.4                                |
| #33.0   | C         | T494C336(1)025A(2)  | 8.3                            | 10.0                             | 1.0                                |
| #47.0   | X         | T494X476(1)025A(2)  | 11.8                           | 6.0                              | 0.3                                |
| †47.0   | D         | T494D476(1)025A(2)  | 11.8                           | 10.0                             | 0.2                                |
| †68.0   | X         | T494X686M025A(2)    | 17.0                           | 8.0                              | 0.3                                |
| †68.0   | D         | T494D686M025A(2)    | 17.0                           | 10.0                             | 0.5                                |
| †100.0  | X         | T494X107M025A(2)    | 25.0                           | 8.0                              | 0.25                               |

(1) To complete KEMET Part Number, insert M for ±20% tolerance or K for ±10% tolerance.  
 (2) To complete KEMET Part Number, insert H, G, or T lead material designation as shown on page 27.

\*Extended Values

†6 Volt product equivalent to 6.3 volt product.

#Maximum Capacitance Change @ 125°C=+15%.

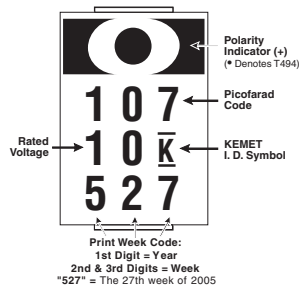
‡Maximum Capacitance Change @ 125°C=+20%.

Higher voltage ratings and tighter tolerance product may be substituted within the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage rating.

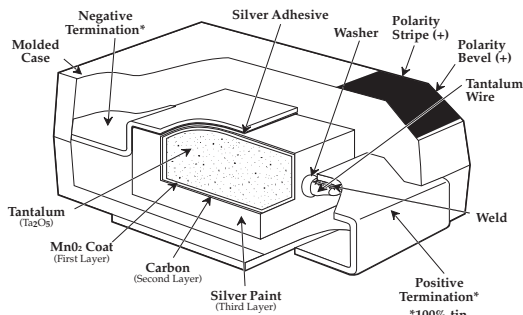
### T494 RATINGS & PART NUMBER REFERENCE

| Capacitance<br>µF   | Case<br>Size | KEMET<br>Part Number | DC<br>Leakage<br>µA @ 25°C<br>Max | DF %<br>@ +25°C<br>120 Hz<br>Max | ESR Ω<br>@ +25°C<br>100 kHz<br>Max |
|---|--------------|----------------------|-----------------------------------|----------------------------------|------------------------------------|
| <b>35 Volt Rating at +85°C (23 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 0.10  | A            | T494A104(1)035A(2)   | 0.5                               | 4.0                              | 10.0                               |
| 0.15  | A            | T494A154(1)035A(2)   | 0.5                               | 4.0                              | 6.0                                |
| 0.22  | A            | T494A224(1)035A(2)   | 0.5                               | 4.0                              | 6.0                                |
| 0.33  | A            | T494A334(1)035A(2)   | 0.5                               | 4.0                              | 6.0                                |
| 0.47  | B            | T494B474(1)035A(2)   | 0.5                               | 4.0                              | 2.5                                |
| 0.47  | A            | T494A474(1)035A(2)   | 0.5                               | 4.0                              | 4.0                                |
| 0.68  | B            | T494B684(1)035A(2)   | 0.5                               | 4.0                              | 2.5                                |
| 0.68  | A            | T494A684(1)035A(2)   | 0.5                               | 4.0                              | 6.0                                |
| 1.0   | B            | T494B105(1)035A(2)   | 0.5                               | 4.0                              | 2.0                                |
| 1.0   | A            | T494A105(1)035A(2)   | 0.5                               | 4.0                              | 6.0                                |
| 1.5   | C            | T494C155(1)035A(2)   | 0.5                               | 6.0                              | 2.5                                |
| 1.5   | B            | T494B155(1)035A(2)   | 0.5                               | 6.0                              | 3.0                                |
| 2.2   | C            | T494C225(1)035A(2)   | 0.8                               | 6.0                              | 1.5                                |
| 2.2   | B            | T494B225(1)035A(2)   | 0.8                               | 6.0                              | 2.5                                |
| 3.3   | C            | T494C335(1)035A(2)   | 1.2                               | 6.0                              | 0.8                                |
| #3.3  | B            | T494B335(1)035A(2)   | 1.2                               | 6.0                              | 1.3                                |
| 4.7   | D            | T494D475(1)035A(2)   | 1.7                               | 6.0                              | 0.7                                |
| 4.7   | C            | T494C475(1)035A(2)   | 1.7                               | 6.0                              | 0.7                                |
| 6.8   | D            | T494D685(1)035A(2)   | 2.4                               | 6.0                              | 0.5                                |
| 6.8   | C            | T494C685(1)035A(2)   | 2.4                               | 6.0                              | 0.9                                |
| 10.0  | D            | T494D106(1)035A(2)   | 3.5                               | 6.0                              | 0.4                                |
| #10.0   | C            | T494C106M035A(2)     | 3.5                               | 6.0                              | 1.2                                |
| #10.0   | *V           | T494V106(1)035A(2)   | 3.5                               | 6.0                              | 0.8                                |
| 15.0  | X            | T494X156(1)035A(2)   | 5.3                               | 6.0                              | 0.30                               |
| 15.0  | D            | T494D156(1)035A(2)   | 5.3                               | 6.0                              | 0.35                               |
| #22.0   | X            | T494X226(1)035A(2)   | 7.7                               | 6.0                              | 0.3                                |
| #22.0   | D            | T494D226(1)035A(2)   | 7.7                               | 6.0                              | 0.4                                |
| #33.0   | D            | T494D336(1)035A(2)   | 11.6                              | 6.0                              | 0.6                                |
| #33.0   | X            | T494X336(1)035A(2)   | 11.6                              | 6.0                              | 0.6                                |
| †47.0   | X            | T494X476(1)035A(2)   | 16.5                              | 8.0                              | 0.5                                |
| †47.0   | E            | T494E476(1)035A(2)   | 16.5                              | 10.0                             | 0.3                                |
| <b>50 Volt Rating at +85°C (33 Volt Rating at +125°C)</b> |              |                      |                                   |                                  |                                    |
| 0.10  | A            | T494A104(1)050A(2)   | 0.5                               | 4.0                              | 10.0                               |
| 0.15  | B            | T494B154(1)050A(2)   | 0.5                               | 4.0                              | 10.0                               |
| 0.15  | A            | T494A154(1)050A(2)   | 0.5                               | 4.0                              | 10.0                               |
| 0.22  | B            | T494B224(1)050A(2)   | 0.5                               | 4.0                              | 10.0                               |
| 0.33  | B            | T494B334(1)050A(2)   | 0.5                               | 4.0                              | 2.5                                |
| 0.47  | C            | T494C474(1)050A(2)   | 0.5                               | 4.0                              | 1.8                                |
| 0.47  | B            | T494B474(1)050A(2)   | 0.5                               | 4.0                              | 2.0                                |
| 0.68  | C            | T494C684(1)050A(2)   | 0.5                               | 4.0                              | 1.6                                |
| 0.68  | B            | T494B684(1)050A(2)   | 0.5                               | 4.0                              | 3.0                                |
| 1.0   | C            | T494C105(1)050A(2)   | 0.5                               | 4.0                              | 1.6                                |
| 1.0   | B            | T494B105(1)050A(2)   | 0.5                               | 6.0                              | 4.0                                |
| #1.0  | V            | T494V105M050A(2)     | 0.5                               | 4.0                              | 4.0                                |
| 1.5   | D            | T494D155(1)050A(2)   | 0.8                               | 6.0                              | 1.0                                |
| 1.5   | C            | T494C155(1)050A(2)   | 0.8                               | 6.0                              | 1.5                                |
| 2.2   | D            | T494D225(1)050A(2)   | 1.1                               | 6.0                              | 0.8                                |
| 2.2   | C            | T494C225(1)050A(2)   | 1.1                               | 6.0                              | 1.5                                |
| 3.3   | D            | T494D335(1)050A(2)   | 1.7                               | 6.0                              | 0.8                                |
| 4.7   | D            | T494D475(1)050A(2)   | 2.4                               | 6.0                              | 0.6                                |
| 6.8   | X            | T494X685(1)050A(2)   | 3.5                               | 6.0                              | 0.5                                |
| #6.8  | D            | T494D685(1)050A(2)   | 3.4                               | 6.0                              | 0.7                                |
| #10.0   | X            | T494X106M050A(2)     | 5.0                               | 6.0                              | 0.4                                |
| #10.0   | D            | T494D106(1)050A(2)   | 5.0                               | 6.0                              | 0.7                                |
| †15.0   | X            | T494X156(1)050A(2)   | 7.5                               | 6.0                              | 0.4                                |
| 22.0  | X            | T494X226(1)050A(2)   | 11.0                              | 10.0                             | 0.5                                |

### CAPACITOR MARKINGS T494 Series — All Case Sizes



### CONSTRUCTION



(1) To complete KEMET Part Number, insert M for ±20% tolerance or K for ±10% tolerance.  
 (2) To complete KEMET Part Number, insert H, G, or T lead material designation as shown on page 27.  
 \*Extended Values

\*\*6 Volt product equivalent to 6.3 volt product.  
 #Maximum Capacitance Change @ 125°C=+15%.  
 †Maximum Capacitance Change @ 125°C=+20%.

Higher voltage ratings and tighter tolerance product may be substituted within the same size at KEMET's option.  
 Voltage substitutions will be marked with the higher voltage rating.

# SOLID TANTALUM CHIP CAPACITORS

T495 SERIES—Low ESR, Surge Robust

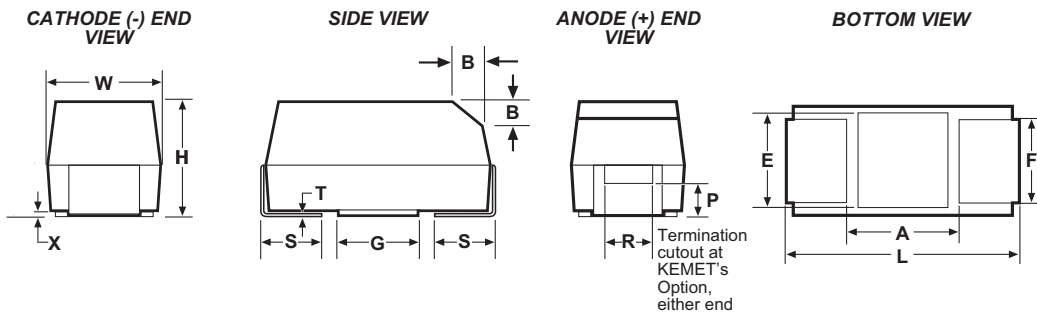


Solid Tantalum Surface Mount

## FEATURES

- Designed for very low ESR
- High ripple current capability
- High surge current capability
- 100% accelerated steady-state aging
- 100% Surge Current test
- Meets or Exceeds EIA Standard 535BAAC
- Available tested per DSCC Dwg. 95158
- Operating Temperature: -55°C to +125°C
- New Extended Values for Low ESR
- Low Equivalent Series Inductance (<2.5nH ESL)
- Precision-molded, laser-marked case
- Symmetrical, compliant terminations
- Taped and reeled per EIA 481-1
- RoHS Compliant & Leadfree Terminations (see www.kemet.com for lead transition)

## OUTLINE DRAWING



## STANDARD T495 DIMENSIONS

Millimeters (Inches)

| Case Size |         | L                          | W                          | H                          | F ±0.1        | S ±0.3        | B ±0.15<br>(Ref) ±(.006) | X (Ref)                      | P (Ref)        | R (Ref)       | T (Ref)        | A (Min)       | G (Ref)       | E (Ref)       |
|-----------|---------|----------------------------|----------------------------|----------------------------|---------------|---------------|--------------------------|------------------------------|----------------|---------------|----------------|---------------|---------------|---------------|
| KEMET     | EIA     |                            |                            |                            |               |               |                          |                              |                |               |                |               |               |               |
| A         | 3216-18 | 3.2 ± 0.2<br>(.126 ± .008) | 1.6 ± 0.2<br>(.063 ± .008) | 1.6 ± 0.2<br>(.063 ± .008) | 1.2<br>(.047) | 0.8<br>(.031) | 0.4<br>(.016)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.4<br>(.016)  | 0.4<br>(.016) | 0.13<br>(.005) | 1.4<br>(.055) | 1.1<br>(.043) | 1.3<br>(.051) |
| B         | 3528-21 | 3.5 ± 0.2<br>(.138 ± .008) | 2.8 ± 0.2<br>(.110 ± .008) | 1.9 ± 0.1<br>(.075 ± .008) | 2.2<br>(.087) | 0.8<br>(.031) | 0.4<br>(.016)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.5<br>(.020)  | 1.0<br>(.039) | 0.13<br>(.005) | 1.1<br>(.043) | 1.8<br>(.071) | 2.2<br>(.087) |
| C         | 6032-28 | 6.0 ± 0.3<br>(.236 ± .012) | 3.2 ± 0.3<br>(.126 ± .012) | 2.5 ± 0.3<br>(.098 ± .012) | 2.2<br>(.087) | 1.3<br>(.051) | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.9<br>(.0235) | 1.0<br>(.039) | 0.13<br>(.005) | 3.1<br>(.122) | 2.8<br>(.110) | 2.4<br>(.094) |
| D         | 7343-31 | 7.3 ± 0.3<br>(.287 ± .012) | 4.3 ± 0.3<br>(.169 ± .012) | 2.8 ± 0.3<br>(.110 ± .012) | 2.4<br>(.094) | 1.3<br>(.051) | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.9<br>(.0235) | 1.0<br>(.039) | 0.13<br>(.005) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |
| X         | 7343-43 | 7.3 ± 0.3<br>(.287 ± .012) | 4.3 ± 0.3<br>(.169 ± .012) | 4.0 ± 0.3<br>(.157 ± .012) | 2.4<br>(.094) | 1.3<br>(.051) | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 1.7<br>(.067)  | 1.0<br>(.039) | 0.13<br>(.005) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |
| E         | 7260-38 | 7.3 ± 0.3<br>(.287 ± .012) | 6.0 ± 0.3<br>(.236 ± .012) | 3.6 ± 0.2<br>(.142 ± .008) | 4.1<br>(.161) | 1.3<br>(.051) | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.9<br>(.035)  | 1.0<br>(.039) | 0.13<br>(.005) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |

- Notes: 1. Metric dimensions govern  
2. (Ref) Dimensions provided for reference only

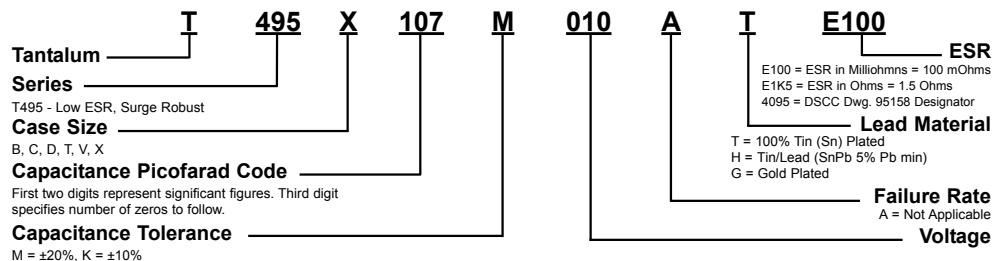
## LOW PROFILE T495 DIMENSIONS

Millimeters (Inches)

| Case Size |         | L                          | W                          | H Max.        | F ±0.1        | S ±0.3        | X (Ref)        | T (Ref)        | A (Min)       | G (Ref)       | E (Ref)       |
|-----------|---------|----------------------------|----------------------------|---------------|---------------|---------------|----------------|----------------|---------------|---------------|---------------|
| KEMET     | EIA     |                            |                            |               |               |               |                |                |               |               |               |
| T         | 3528-12 | 3.5 ± 0.2<br>(.138 ± .008) | 2.8 ± 0.2<br>(.110 ± .008) | 1.2<br>(.047) | 2.2<br>(.087) | 0.8<br>(.031) | 0.05<br>(.002) | 0.13<br>(.005) | 1.1<br>(.043) | 1.8<br>(.071) | 2.2<br>(.087) |
| V         | 7343.2  | 7.3 ± 0.3<br>(.287 ± .012) | 4.3 ± 0.3<br>(.169 ± .012) | 2.0<br>(.079) | 2.4<br>(.094) | 1.3<br>(.051) | 0.05<br>(.002) | 0.13<br>(.005) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |

- Notes: 1. Metric dimensions govern.  
2. (Ref) - Dimensions provided for reference only.  
3. No dimensions provided for B, P or R because low profile cases do not have a bevel or a notch.

## T495 Series - ORDERING INFORMATION



### T495 RATINGS & PART NUMBER REFERENCE

| Capacitance $\mu\text{F}$                                  | Case Size | KEMET Part Number      | DSCC Dwg. No. 95158 Part Number | DC Leakage $\mu\text{A}$ @ 25°C Max | DF% @ 25°C 120 Hz Max | ESR m $\Omega$ @ 25°C 100 kHz Max | Ripple Current mA rms @ 25°C, 100 kHz Max |      |       |
|--|-----------|------------------------|---------------------------------|-------------------------------------|-----------------------|-----------------------------------|---|------|-------|
|  |           |                        |                                 |                                     |                       |                                   | 25°C                                      | 85°C | 125°C |
| <b>2.5 Volt Rating @ +85°C (1.7 Volt Rating at +125°C)</b> |           |                        |                                 |                                     |                       |                                   |   |      |       |
| 100.0  | T         | T495T107M2R5A(2)E3K0   |                                 | 2.5                                 | 24.0                  | 3000                              | 153                                       | 137  | 61    |
| 220.0  | D         | T495D227(1)2R5A(2)E045 |                                 | 5.5                                 | 8.0                   | 45                                | 1826                                      | 1643 | 730   |
| 470.0  | D         | T495D477(1)2R5A(2)E035 |                                 | 11.8                                | 8.0                   | 35                                | 2070                                      | 1863 | 828   |
| 1000.0   | X         | T495X108(1)2R5A(2)E030 |                                 | 25.0                                | 15.0                  | 30                                | 2345                                      | 2111 | 938   |
| 1000.0   | X         | T495X108(1)2R5A(2)E040 |                                 | 25.0                                | 15.0                  | 40                                | 2031                                      | 1828 | 812   |
| <b>4 Volt Rating @ +85°C (2.7 Volt Rating at +125°C)</b>   |           |                        |                                 |                                     |                       |                                   |   |      |       |
| 68.0   | V         | T495V686(1)004A(2)E150 |                                 | 2.7                                 | 6.0                   | 150                               | 913                                       | 822  | 365   |
| 100.0  | B         | T495B107(1)004A(2)E500 |                                 | 4.0                                 | 8.0                   | 500                               | 412                                       | 371  | 163   |
| 150.0  | B         | T495B157M006A(2)E900   |                                 | 6.0                                 | 12.0                  | 900                               | 307                                       | 277  | 123   |
| 150.0  | C         | T495C157(1)004A(2)E070 |                                 | 6.0                                 | 12.0                  | 70                                | 1254                                      | 1128 | 501   |
| 150.0  | C         | T495C157(1)004A(2)E250 |                                 | 6.0                                 | 8.0                   | 250                               | 663                                       | 597  | 265   |
| 220.0  | D         | T495D227(1)004A(2)E040 |                                 | 8.8                                 | 8.0                   | 40                                | 1936                                      | 1743 | 775   |
| 220.0  | D         | T495D227(1)004A(2)E050 |                                 | 8.8                                 | 8.0                   | 50                                | 1732                                      | 1559 | 693   |
| 220.0  | D         | T495D227(1)004A(2)E100 |                                 | 8.8                                 | 8.0                   | 100                               | 1225                                      | 1102 | 490   |
| 330.0  | C         | T495C337(1)004A(2)E300 |                                 | 13.2                                | 10.0                  | 300                               | 606                                       | 545  | 242   |
| 330.0  | C         | T495C337(1)004A(2)E700 |                                 | 13.2                                | 12.0                  | 700                               | 396                                       | 357  | 159   |
| 330.0  | D         | T495D337(1)004A(2)E030 |                                 | 13.2                                | 8.0                   | 30                                | 2236                                      | 2012 | 894   |
| 330.0  | D         | T495D337(1)004A(2)E045 |                                 | 13.2                                | 8.0                   | 45                                | 1826                                      | 1643 | 730   |
| 470.0  | D         | T495D477(1)004A(2)E045 |                                 | 18.8                                | 12.0                  | 45                                | 1826                                      | 1643 | 730   |
| 470.0  | D         | T495D477(1)004A(2)E100 |                                 | 18.8                                | 12.0                  | 100                               | 1225                                      | 1102 | 490   |
| 470.0  | X         | T495X477(1)004A(2)E030 |                                 | 18.8                                | 8.0                   | 30                                | 2345                                      | 2111 | 938   |
| 470.0  | X         | T495X477(1)004A(2)E045 |                                 | 18.8                                | 8.0                   | 45                                | 1915                                      | 1723 | 766   |
| 470.0  | X         | T495X477(1)004A(2)E100 |                                 | 18.8                                | 8.0                   | 100                               | 1285                                      | 1156 | 514   |
| 1000.0   | X         | T495X108(1)004A(2)E030 |                                 | 40.0                                | 12.0                  | 30                                | 2345                                      | 2111 | 938   |
| 1000.0   | X         | T495X108(1)004A(2)E040 |                                 | 40.0                                | 12.0                  | 40                                | 2031                                      | 1828 | 812   |
| 1000.0   | X         | T495X108(1)004A(2)E060 |                                 | 40.0                                | 12.0                  | 60                                | 1658                                      | 1492 | 663   |
| 1000.0   | X         | T495X108(1)004A(2)E070 |                                 | 40.0                                | 12.0                  | 70                                | 1535                                      | 1381 | 614   |
| 1000.0   | E         | T495E108(1)004A(2)E035 |                                 | 40.0                                | 15.0                  | 35                                | 2390                                      | 2151 | 956   |
| 1000.0   | E         | T495E108(1)004A(2)E050 |                                 | 40.0                                | 15.0                  | 50                                | 2000                                      | 1800 | 800   |
| <b>6/3.3 Volt Rating @ +85°C (4 Volt Rating at +125°C)</b> |           |                        |                                 |                                     |                       |                                   |   |      |       |
| 47.0   | B         | T495B476(1)006A(2)E450 |                                 | 3.0                                 | 6.0                   | 450                               | 435                                       | 392  | 174   |
| 47.0   | C         | T495C476(1)006A(2)E250 |                                 | 2.9                                 | 6.0                   | 250                               | 663                                       | 597  | 265   |
| 47.0   | V         | T495V476(1)006A(2)E150 |                                 | 3.0                                 | 6.0                   | 150                               | 913                                       | 822  | 365   |
| 68.0   | D         | T495D686(1)006A(2)E175 |                                 | 3.3                                 | 4.0                   | 175                               | 926                                       | 833  | 370   |
| 68.0   | D         | T495D686(1)006A(2)4095 | 95158-01(1)(2)                  | 3.3                                 | 4.0                   | 175                               | 926                                       | 833  | 370   |
| 100.0  | B         | T495B107(1)006A(2)E400 |                                 | 6.3                                 | 15.0                  | 400                               | 461                                       | 415  | 184   |
| 100.0  | B         | T495B107M006A(2)E700   |                                 | 6.3                                 | 15.0                  | 700                               | 348                                       | 313  | 139   |
| 100.0  | C         | T495C107(1)006A(2)E075 |                                 | 6.3                                 | 8.0                   | 75                                | 1211                                      | 1090 | 484   |
| 100.0  | C         | T495C107(1)006A(2)E150 |                                 | 6.0                                 | 8.0                   | 150                               | 856                                       | 770  | 342   |
| 100.0  | D         | T495D107(1)006A(2)E050 |                                 | 6.0                                 | 6.0                   | 50                                | 1732                                      | 1559 | 693   |
| 100.0  | D         | T495D107(1)006A(2)E130 |                                 | 6.0                                 | 6.0                   | 130                               | 1074                                      | 967  | 430   |
| 100.0  | D         | T495D107(1)006A(2)E150 |                                 | 6.0                                 | 8.0                   | 150                               | 1000                                      | 900  | 400   |
| 100.0  | V         | T495V107(1)006A(2)E090 |                                 | 6.0                                 | 8.0                   | 90                                | 1179                                      | 1061 | 471   |
| 100.0  | V         | T495V107(1)006A(2)E150 |                                 | 6.0                                 | 8.0                   | 150                               | 913                                       | 822  | 365   |
| 150.0  | C         | T495C157(1)006A(2)E050 |                                 | 9.5                                 | 8.0                   | 50                                | 1483                                      | 1335 | 593   |
| 150.0  | C         | T495C157M006A(2)E200   |                                 | 9.0                                 | 8.0                   | 200                               | 742                                       | 668  | 297   |
| 150.0  | V         | T495V157(1)006A(2)E040 |                                 | 9.5                                 | 8.0                   | 40                                | 1768                                      | 1591 | 707   |
| 150.0  | V         | T495V157(1)006A(2)E070 |                                 | 9.0                                 | 8.0                   | 70                                | 1336                                      | 1203 | 535   |
| 150.0  | D         | T495D157(1)006A(2)E050 |                                 | 9.0                                 | 6.0                   | 50                                | 1732                                      | 1559 | 693   |
| 150.0  | D         | T495D157(1)006A(2)E125 |                                 | 9.0                                 | 6.0                   | 125                               | 1095                                      | 986  | 438   |
| 150.0  | X         | T495X157(1)006A(2)E100 |                                 | 7.2                                 | 6.0                   | 100                               | 1285                                      | 1156 | 514   |
| 150.0  | X         | T495X157(1)006A(2)4095 | 95158-02(1)(2)                  | 7.2                                 | 6.0                   | 125                               | 1150                                      | 1040 | 460   |
| 220.0  | C         | T495C227(1)006A(2)E225 |                                 | 13.9                                | 10.0                  | 225                               | 700                                       | 600  | 300   |
| 220.0  | D         | T495D227(1)006A(2)E045 |                                 | 13.2                                | 8.0                   | 45                                | 1826                                      | 1643 | 730   |
| 220.0  | D         | T495D227(1)006A(2)E100 |                                 | 13.9                                | 8.0                   | 100                               | 1225                                      | 1102 | 490   |
| 220.0  | D         | T495D227(1)006A(2)4095 | 95158-25(1)(2)                  | 13.2                                | 8.0                   | 100                               | 1225                                      | 1102 | 490   |
| 220.0  | X         | T495X227(1)006A(2)E070 |                                 | 13.2                                | 8.0                   | 70                                | 1535                                      | 1381 | 614   |
| 220.0  | X         | T495X227(1)006A(2)E100 |                                 | 13.2                                | 8.0                   | 100                               | 1285                                      | 1156 | 514   |
| 220.0  | X         | T495X227(1)006A(2)4095 | 95158-03(1)(2)                  | 13.2                                | 8.0                   | 100                               | 1285                                      | 1156 | 514   |
| 330.0  | D         | T495D337(1)006A(2)E040 |                                 | 20.8                                | 8.0                   | 40                                | 1936                                      | 1743 | 775   |
| 330.0  | D         | T495D337(1)006A(2)E050 |                                 | 20.8                                | 8.0                   | 50                                | 1732                                      | 1559 | 693   |
| 330.0  | D         | T495D337(1)006A(2)E070 |                                 | 20.8                                | 8.0                   | 70                                | 1464                                      | 1317 | 586   |
| 330.0  | D         | T495D337(1)006A(2)E100 |                                 | 20.8                                | 8.0                   | 100                               | 1225                                      | 1102 | 490   |
| 330.0  | X         | T495X337(1)006A(2)E065 |                                 | 19.8                                | 8.0                   | 65                                | 1593                                      | 1434 | 637   |
| 330.0  | X         | T495X337(1)006A(2)E045 |                                 | 19.8                                | 8.0                   | 45                                | 1915                                      | 1723 | 766   |
| 330.0  | X         | T495X337(1)006A(2)E100 |                                 | 19.8                                | 8.0                   | 100                               | 1285                                      | 1156 | 514   |
| 330.0  | E         | T495E337(1)006A(2)E060 |                                 | 20.8                                | 8.0                   | 60                                | 1826                                      | 1643 | 730   |
| 330.0  | E         | T495E337(1)006A(2)E100 |                                 | 20.8                                | 8.0                   | 100                               | 1414                                      | 1273 | 566   |
| 470.0  | D         | T495D477M006A(2)E045   |                                 | 29.6                                | 12.0                  | 45                                | 1826                                      | 1643 | 730   |
| 470.0  | D         | T495D477(1)006A(2)E100 |                                 | 29.6                                | 12.0                  | 100                               | 1225                                      | 1102 | 490   |
| 470.0  | D         | T495D477(1)006A(2)E125 |                                 | 29.6                                | 12.0                  | 125                               | 1095                                      | 986  | 438   |
| 470.0  | X         | T495X477(1)006A(2)E030 |                                 | 28.2                                | 10.0                  | 30                                | 2345                                      | 2111 | 938   |
| 470.0  | X         | T495X477(1)006A(2)E045 |                                 | 28.2                                | 10.0                  | 45                                | 1915                                      | 1723 | 766   |
| 470.0  | X         | T495X477(1)006A(2)E050 |                                 | 28.2                                | 10.0                  | 50                                | 1816                                      | 1634 | 726   |
| 470.0  | X         | T495X477(1)006A(2)E065 |                                 | 28.2                                | 10.0                  | 65                                | 1593                                      | 1434 | 637   |
| 470.0  | E         | T495E477(1)006A(2)E040 |                                 | 29.6                                | 12.0                  | 40                                | 2236                                      | 2012 | 894   |
| 470.0  | E         | T495E477(1)006A(2)E065 |                                 | 29.6                                | 10.0                  | 55                                | 1907                                      | 1716 | 763   |
| 470.0  | E         | T495E477(1)006A(2)E100 |                                 | 29.6                                | 10.0                  | 100                               | 1414                                      | 1273 | 566   |
| 1000.0   | E         | T495E108(1)006A(2)E050 |                                 | 63.0                                | 15.0                  | 50                                | 2000                                      | 1800 | 800   |

| Capacitance $\mu\text{F}$                               | Case Size | KEMET Part Number      | DSCC Dwg. No. 95158 Part Number | DC Leakage $\mu\text{A}$ @ 25°C Max | DF% @ 25°C 120 Hz Max | ESR m $\Omega$ @ 25°C 100 kHz Max | Ripple Current mA rms @ 25°C, 100 kHz Max |      |       |
|---|-----------|------------------------|---------------------------------|-------------------------------------|-----------------------|-----------------------------------|---|------|-------|
|   |           |                        |                                 |                                     |                       |                                   | 25°C                                      | 85°C | 125°C |
| <b>10 Volt Rating @ +85°C (7 Volt Rating at +125°C)</b> |           |                        |                                 |                                     |                       |                                   |   |      |       |
| 4.7   | A         | T495A475(1)010A(2)E1K3 |                                 | 0.5                                 | 6.0                   | 1300                              | 240                                       | 216  | 96    |
| 4.7   | B         | T495B475(1)010A(2)E1K3 |                                 | 0.5                                 | 15.0                  | 1300                              | 256                                       | 230  | 102   |
| 6.8   | A         | T495A685(1)010A(2)E1K8 |                                 | 0.7                                 | 6.0                   | 1800                              | 204                                       | 184  | 82    |
| 6.8   | B         | T495B685(1)010A(2)E900 |                                 | 0.7                                 | 6.0                   | 900                               | 307                                       | 277  | 123   |
| 6.8   | A         | T495A106(1)010A(2)E1K8 |                                 | 1.0                                 | 6.0                   | 1800                              | 204                                       | 184  | 82    |
| 10.0  | B         | T495B106(1)010A(2)E750 |                                 | 1.0                                 | 6.0                   | 750                               | 337                                       | 303  | 135   |
| 15.0  | B         | T495B156(1)010A(2)E500 |                                 | 1.5                                 | 6.0                   | 500                               | 412                                       | 371  | 165   |
| 15.0  | C         | T495C156(1)010A(2)E375 |                                 | 1.5                                 | 6.0                   | 375                               | 542                                       | 487  | 217   |
| 15.0  | C         | T495C156(1)010A(2)E400 |                                 | 1.5                                 | 6.0                   | 400                               | 524                                       | 472  | 210   |
| 15.0  | C         | T495C156(1)010A(2)E475 |                                 | 1.5                                 | 6.0                   | 475                               | 481                                       | 433  | 192   |
| 22.0  | C         | T495C226(1)010A(2)E290 |                                 | 2.2                                 | 6.0                   | 290                               | 616                                       | 554  | 246   |
| 22.0  | C         | T495C226(1)010A(2)E345 |                                 | 2.2                                 | 6.0                   | 345                               | 565                                       | 508  | 226   |
| 33.0  | B         | T495B336(1)010A(2)E450 |                                 | 3.3                                 | 6.0                   | 450                               | 435                                       | 392  | 174   |
| 33.0  | V         | T495V336(1)010A(2)E100 |                                 | 3.3                                 | 6.0                   | 100                               | 1118                                      | 1006 | 447   |
| 33.0  | V         | T495V336(1)010A(2)E150 |                                 | 3.3                                 | 6.0                   | 150                               | 913                                       | 822  | 365   |
| 47.0  | B         | T495B476(1)010A(2)E500 |                                 | 4.7                                 | 6.0                   | 500                               | 412                                       | 371  | 164   |
| 47.0  | D         | T495D476(1)010A(2)E080 |                                 | 3.8                                 | 4.0                   | 80                                | 1369                                      | 1232 | 548   |
| 47.0  | D         | T495D476(1)010A(2)E090 |                                 | 4.7                                 | 6.0                   | 90                                | 1291                                      | 1162 | 516   |
| 47.0  | D         | T495D476(1)010A(2)E200 |                                 | 3.8                                 | 4.0                   | 200                               | 866                                       | 780  | 346   |
| 47.0  | D         | T495D476(1)010A(2)4095 | 95158-04(1)(2)                  | 3.8                                 | 4.0                   | 200                               | 866                                       | 780  | 346   |
| 68.0  | B         | T495B686(1)010A(2)E600 |                                 | 6.8                                 | 10.0                  | 600                               | 376                                       | 339  | 151   |
| 68.0  | B         | T495B686(1)010A(2)E750 |                                 | 1.5                                 | 10.0                  | 750                               | 337                                       | 303  | 135   |
| 68.0  | B         | T495B686M010A(2)E900   |                                 | 6.8                                 | 10.0                  | 900                               | 307                                       | 276  | 123   |
| 68.0  | C         | T495C686(1)010A(2)E080 |                                 | 6.8                                 | 6.0                   | 80                                | 1173                                      | 1055 | 469   |
| 68.0  | C         | T495C686(1)010A(2)E225 |                                 | 6.8                                 | 6.0                   | 225                               | 700                                       | 630  | 280   |
| 68.0  | V         | T495V686(1)010A(2)E070 |                                 | 6.8                                 | 6.0                   | 70                                | 1336                                      |      |       |

# SOLID TANTALUM CHIP CAPACITORS

T495 SERIES—Low ESR, Surge Robust



Solid Tantalum Surface Mount

## T495 RATINGS & PART NUMBER REFERENCE

| Capacitance $\mu$ F                               | Case Size | KEMET Part Number       | DSCC Dwg. No. 95158 Part Number | DC Leakage $\mu$ A @ 25°C Max | DF% @ 25°C 120 Hz Max | ESR m $\Omega$ @ 25°C 100 kHz Max | Ripple Current mA rms @ 25°C, 100 kHz Max              |      |       |
|---|-----------|-------------------------|---------------------------------|-------------------------------|-----------------------|-----------------------------------|--|------|-------|
|   |           |                         |                                 |                               |                       |                                   | 25°C   | 85°C | 125°C |
|   |           |                         |                                 |                               |                       |                                   | 10 Volt Rating @ +85°C (7 Volt Rating at +125°C) cont. |      |       |
| 220.0   | D         | T495D227(1)010A(2)E045  |                                 | 22.0                          | 8.0                   | 45                                | 1826   | 1643 | 730   |
| 220.0   | D         | T495D227(1)010A(2)E075  |                                 | 22.0                          | 8.0                   | 75                                | 1414   | 1273 | 566   |
| 220.0   | D         | T495D227(1)010A(2)E100  |                                 | 22.0                          | 8.0                   | 100                               | 1225   | 1102 | 490   |
| 220.0   | D         | T495D227(1)010A(2)E125  |                                 | 22.0                          | 8.0                   | 125                               | 1095   | 986  | 438   |
| 220.0   | X         | T495X227(1)010A(2)E045  |                                 | 22.0                          | 8.0                   | 45                                | 1915   | 1723 | 766   |
| 220.0   | X         | T495X227(1)010A(2)E050  |                                 | 22.0                          | 8.0                   | 50                                | 1817   | 1635 | 727   |
| 220.0   | X         | T495X227(1)010A(2)E060  |                                 | 22.0                          | 8.0                   | 60                                | 1658   | 1492 | 663   |
| 220.0   | X         | T495X227(1)010A(2)E070  |                                 | 22.0                          | 8.0                   | 70                                | 1535   | 1382 | 614   |
| 220.0   | X         | T495X227(1)010A(2)E100  |                                 | 22.0                          | 8.0                   | 100                               | 1285   | 1156 | 514   |
| 220.0   | X         | T495X227(1)010A(2)E100  | 95158-28(1)(2)                  | 15.0                          | 8.0                   | 100                               | 1285   | 1156 | 514   |
| 330.0   | D         | T495D337(1)010A(2)E100  |                                 | 33.0                          | 8.0                   | 100                               | 1227   | 1102 | 490   |
| 330.0   | D         | T495D337(1)010A(2)E125  |                                 | 33.0                          | 10.0                  | 125                               | 1095   | 986  | 438   |
| 330.0   | D         | T495D337(1)010A(2)E150  |                                 | 33.0                          | 10.0                  | 150                               | 1000   | 900  | 400   |
| 330.0   | X         | T495X337(1)010A(2)E035  |                                 | 33.0                          | 10.0                  | 35                                | 2171   | 1954 | 868   |
| 330.0   | X         | T495X337(1)010A(2)E050  |                                 | 33.0                          | 10.0                  | 50                                | 1817   | 1635 | 727   |
| 330.0   | X         | T495X337(1)010A(2)E060  |                                 | 33.0                          | 10.0                  | 60                                | 1658   | 1492 | 663   |
| 330.0   | X         | T495X337(1)010A(2)E100  |                                 | 33.0                          | 10.0                  | 100                               | 1284   | 1156 | 513   |
| 330.0   | E         | T495E337(1)010A(2)E040  |                                 | 33.0                          | 8.0                   | 40                                | 2236   | 2012 | 894   |
| 330.0   | E         | T495E337(1)010A(2)E060  |                                 | 33.0                          | 10.0                  | 60                                | 1826   | 1643 | 730   |
| 330.0   | E         | T495E337(1)010A(2)E100  |                                 | 33.0                          | 10.0                  | 100                               | 1414   | 1273 | 566   |
| 470.0   | X         | T495X477M010A(2)E045    |                                 | 47.0                          | 10.0                  | 45                                | 1915   | 1723 | 766   |
| 470.0   | X         | T495X477M010A(2)E050    |                                 | 47.0                          | 10.0                  | 50                                | 1817   | 1635 | 727   |
| 470.0   | X         | T495X477M010A(2)E060    |                                 | 47.0                          | 10.0                  | 60                                | 1658   | 1492 | 663   |
| 470.0   | X         | T495X477M010A(2)E100    |                                 | 47.0                          | 10.0                  | 100                               | 1284   | 1156 | 513   |
| 470.0   | X         | T495X477M010A(2)E200    |                                 | 47.0                          | 10.0                  | 200                               | 908  | 817  | 363   |
| 470.0   | E         | T495E477(1)010A(2)E040  |                                 | 47.0                          | 10.0                  | 40                                | 2236   | 2012 | 894   |
| 470.0   | E         | T495E477(1)010A(2)E060  |                                 | 47.0                          | 10.0                  | 60                                | 1826   | 1643 | 730   |
| 470.0   | E         | T495E477(1)010A(2)E100  |                                 | 47.0                          | 10.0                  | 100                               | 1414   | 1273 | 566   |
| 16 Volt Rating @ +85°C (10 Volt Rating at +125°C) |           |                         |                                 |                               |                       |                                   |  |      |       |
| 3.3   | A         | T495A335(1)016A(2)E3K0  |                                 | 0.5                           | 6.0                   | 3000                              | 158  | 142  | 63    |
| 4.7   | A         | T495A475(1)016A(2)E2K0  |                                 | 0.8                           | 6.0                   | 2000                              | 194  | 174  | 77    |
| 4.7   | B         | T495B475(1)016A(2)E700  |                                 | 0.8                           | 6.0                   | 700                               | 348  | 313  | 139   |
| 6.8   | C         | T495C685(1)016A(2)E750  |                                 | 1.1                           | 6.0                   | 750                               | 383  | 345  | 153   |
| 10.0  | T         | T495T106M016A(2)E4K0    |                                 | 1.6                           | 8.0                   | 4000                              | 132  | 119  | 53    |
| 15.0  | A         | T495A156(1)016A(2)E2K5  |                                 | 2.4                           | 8.0                   | 2500                              | 173  | 156  | 69    |
| 15.0  | B         | T495B156(1)016A(2)E800  |                                 | 2.4                           | 6.0                   | 800                               | 326  | 293  | 130   |
| 33.0  | C         | T495C336(1)016A(2)E200  |                                 | 5.3                           | 6.0                   | 200                               | 742  | 667  | 297   |
| 33.0  | C         | T495C336(1)016A(2)E225  |                                 | 5.3                           | 6.0                   | 225                               | 699  | 629  | 283   |
| 33.0  | C         | T495C336(1)016A(2)E275  |                                 | 5.3                           | 6.0                   | 275                               | 632  | 569  | 253   |
| 33.0  | D         | T495D336(1)016A(2)E150  |                                 | 6.6                           | 6.0                   | 150                               | 1000   | 900  | 400   |
| 33.0  | D         | T495D336(1)016A(2)E175  |                                 | 6.6                           | 6.0                   | 175                               | 926  | 833  | 370   |
| 33.0  | D         | T495D336(1)016A(2)E225  |                                 | 4.2                           | 4.0                   | 225                               | 816  | 735  | 327   |
| 33.0  | D         | T495D336(1)016A(2)E4095 |                                 | 4.2                           | 4.0                   | 250                               | 770  | 700  | 310   |
| 47.0  | C         | T495C476(1)016A(2)E350  |                                 | 7.5                           | 6.0                   | 350                               | 561  | 505  | 224   |
| 47.0  | D         | T495D476(1)016A(2)E080  |                                 | 7.5                           | 6.0                   | 80                                | 1369   | 1232 | 547   |
| 47.0  | D         | T495D476(1)016A(2)E100  |                                 | 7.5                           | 6.0                   | 100                               | 1225   | 1102 | 490   |
| 47.0  | D         | T495D476(1)016A(2)E150  |                                 | 7.5                           | 6.0                   | 150                               | 1000   | 900  | 400   |
| 47.0  | D         | T495D476(1)016A(2)E4095 | 95158-10(1)(2)                  | 7.5                           | 6.0                   | 200                               | 870  | 780  | 345   |
| 68.0  | V         | T495V686(1)016A(2)E180  |                                 | 10.9                          | 6.0                   | 180                               | 833  | 750  | 333   |
| 68.0  | V         | T495V686(1)016A(2)E300  |                                 | 10.9                          | 6.0                   | 300                               | 645  | 581  | 258   |
| 68.0  | D         | T495D686(1)016A(2)E070  |                                 | 10.9                          | 6.0                   | 70                                | 1464   | 1317 | 586   |
| 68.0  | D         | T495D686(1)016A(2)E100  |                                 | 10.9                          | 6.0                   | 100                               | 1225   | 1102 | 490   |
| 68.0  | D         | T495D686(1)016A(2)E150  |                                 | 10.9                          | 6.0                   | 150                               | 1000   | 900  | 400   |
| 100.0   | D         | T495D107(1)016(2)E100   |                                 | 16.0                          | 8.0                   | 100                               | 1225   | 1102 | 490   |
| 100.0   | D         | T495D107(1)016A(2)E125  |                                 | 16.0                          | 8.0                   | 125                               | 1095   | 986  | 438   |
| 100.0   | X         | T495X107(1)016A(2)E080  |                                 | 16.0                          | 8.0                   | 80                                | 1436   | 1293 | 574   |
| 100.0   | X         | T495X107(1)016A(2)E100  |                                 | 16.0                          | 8.0                   | 100                               | 1285   | 1156 | 514   |
| 100.0   | X         | T495X107(1)016A(2)E4095 | 95158-11(1)(2)                  | 16.0                          | 8.0                   | 125                               | 1149   | 1034 | 460   |
| 150.0   | D         | T495D157M016A(2)E060    |                                 | 24.0                          | 12.0                  | 60                                | 1581   | 1423 | 632   |
| 150.0   | D         | T495D157M016A(2)E085    |                                 | 24.0                          | 8.0                   | 85                                | 1328   | 1196 | 531   |
| 150.0   | D         | T495D157M016A(2)E100    |                                 | 24.0                          | 8.0                   | 100                               | 1224   | 1102 | 489   |
| 150.0   | D         | T495D157(1)016A(2)E125  |                                 | 24.0                          | 8.0                   | 125                               | 1095   | 985  | 438   |
| 150.0   | D         | T495D157(1)016A(2)E150  |                                 | 24.0                          | 8.0                   | 150                               | 1000   | 900  | 400   |
| 150.0   | X         | T495X157(1)016A(2)E075  |                                 | 24.0                          | 8.0                   | 75                                | 1483   | 1335 | 593   |
| 150.0   | X         | T495X157(1)016A(2)E100  |                                 | 24.0                          | 8.0                   | 100                               | 1285   | 1156 | 514   |
| 220.0   | X         | T495X227(1)016A(2)E100  |                                 | 35.2                          | 8.0                   | 100                               | 1284   | 1156 | 513   |
| 220.0   | E         | T495E227(1)016A(2)E050  |                                 | 35.2                          | 12.0                  | 50                                | 2000   | 1800 | 800   |
| 220.0   | E         | T495E227(1)016A(2)E075  |                                 | 35.2                          | 8.0                   | 75                                | 1632   | 1469 | 652   |
| 220.0   | E         | T495E227(1)016A(2)E100  |                                 | 35.2                          | 7.2                   | 100                               | 1414   | 1273 | 566   |
| 220.0   | E         | T495E227(1)016A(2)E150  |                                 | 35.2                          | 7.2                   | 150                               | 1155   | 1039 | 462   |

| Capacitance $\mu$ F                               | Case Size | KEMET Part Number       | DSCC Dwg. No. 95158 Part Number | DC Leakage $\mu$ A @ 25°C Max | DF% @ 25°C 120 Hz Max | ESR m $\Omega$ @ 25°C 100 kHz Max | Ripple Current mA rms @ 25°C, 100 kHz Max         |      |       |
|---|-----------|-------------------------|---------------------------------|-------------------------------|-----------------------|-----------------------------------|---|------|-------|
|   |           |                         |                                 |                               |                       |                                   | 25°C  | 85°C | 125°C |
|   |           |                         |                                 |                               |                       |                                   | 20 Volt Rating @ +85°C (13 Volt Rating at +125°C) |      |       |
| 1.0   | A         | T495A105(1)020A(2)E3K0  |                                 | 0.2                           | 4.0                   | 3000                              | 158   | 142  | 63    |
| 10.0  | B         | T495B106(1)020A(2)E1K0  |                                 | 2.0                           | 6.0                   | 1000                              | 292   | 262  | 117   |
| 10.0  | C         | T495C106(1)020A(2)E400  |                                 | 2.0                           | 6.0                   | 400                               | 524   | 472  | 210   |
| 10.0  | C         | T495C106(1)020A(2)E475  |                                 | 2.0                           | 6.0                   | 475                               | 481   | 433  | 192   |
| 15.0  | C         | T495C156(1)020A(2)E375  |                                 | 3.0                           | 6.0                   | 375                               | 542   | 487  | 217   |
| 15.0  | D         | T495D156(1)020A(2)E275  |                                 | 2.4                           | 4.0                   | 275                               | 738   | 665  | 295   |
| 15.0  | D         | T495D156(1)020A(2)E4095 | 95158-12(1)(2)                  | 2.4                           | 4.0                   | 275                               | 738   | 665  | 295   |
| 22.0  | D         | T495D226(1)020A(2)E180  |                                 | 3.5                           | 4.0                   | 180                               | 913   | 822  | 366   |
| 22.0  | D         | T495D226(1)020A(2)E225  |                                 | 3.5                           | 4.0                   | 225                               | 816   | 735  | 325   |
| 22.0  | D         | T495D226(1)020A(2)E4095 | 95158-13(1)(2)                  | 3.5                           | 4.0                   | 275                               | 739   | 665  | 295   |
| 33.0  | D         | T495D336(1)020A(2)E100  |                                 | 6.6                           | 6.0                   | 100                               | 1225  | 1102 | 490   |
| 33.0  | D         | T495D336(1)020A(2)E150  |                                 | 6.6                           | 6.0                   | 150                               | 1000  | 900  | 400   |
| 33.0  | D         | T495D336(1)020A(2)E200  |                                 | 6.6                           | 6.0                   | 200                               | 866   | 780  | 346   |
| 47.0  | D         | T495D476(1)020A(2)E075  |                                 | 9.4                           | 6.0                   | 75                                | 1414  | 1272 | 565   |
| 47.0  | D         | T495D476(1)020A(2)E100  |                                 | 9.4                           | 6.0                   | 100                               | 1225  | 1102 | 490   |
| 47.0  | D         | T495D476(1)020A(2)E175  |                                 | 9.4                           | 6.0                   | 175                               | 926   | 833  | 370   |
| 47.0  | X         | T495X476(1)020A(2)E065  |                                 | 9.4                           | 8.0                   | 65                                | 1593  | 1434 | 637   |
| 47.0  | X         | T495X476(1)020A(2)E100  |                                 | 9.4                           | 6.0                   | 100                               | 1285  | 1156 | 514   |
| 47.0  | X         | T495X476(1)020A(2)E125  |                                 | 9.4                           | 6.0                   | 125                               | 1149  | 1034 | 460   |
| 47.0  | X         | T495X476(1)020A(2)E150  |                                 | 7.5                           | 4.0                   | 150                               | 1049  | 944  | 420   |
| 47.0  | X         | T495X476(1)020A(2)E4095 | 95158-14(1)(2)                  | 7.5                           | 4.0                   | 150                               | 1049  | 944  | 420   |
| 68.0  | D         | T495D686(1)020A(2)E070  |                                 | 13.6                          | 8.0                   | 70                                | 1464  | 1317 | 586   |
| 68.0  | D         | T495D686(1)020A(2)E150  |                                 | 13.6                          | 8.0                   | 150                               | 1000  | 900  | 400   |
| 68.0  | X         | T495X686(1)020A(2)E120  |                                 | 13.6                          | 6.0                   | 120                               | 1173  | 1055 | 469   |
| 68.0  | X         | T495X686(1)020A(2)E150  |                                 | 13.6                          | 6.0                   | 150                               | 1049  | 944  | 420   |
| 68.0  | X         | T495X686(1)020A(2)E4095 | 95158-15(1)(2)                  | 13.6                          | 6.0                   | 150                               | 1049  | 944  | 420   |
| 100.0   | X         | T495X107(1)020A(2)E100  |                                 | 20.0                          | 6.0                   | 100                               | 1285  | 1156 | 514   |
| 100.0   | X         | T495X107(1)020A(2)E150  |                                 | 20.0                          | 8.0                   | 150                               | 1049  | 944  | 420   |
| 100.0   | E         | T495E107(1)020A(2)E060  |                                 | 20.0                          | 8.0                   | 60                                | 1826  | 1643 | 730   |
| 100.0   | E         | T495E107(1)020A(2)E085  |                                 | 20.0                          | 8.0                   | 85                                | 1534  | 1381 | 614   |
| 100.0   | E         | T495E107(1)020A(2)E100  |                                 | 20.0                          | 8.0                   | 100                               | 1414  | 1273 | 566   |
| 100.0   | E         | T495E107(1)020A(2)E200  |                                 | 20.0                          | 8.0                   | 200                               | 1000  | 900  | 400   |
| 150.0   | E         | T495E157(1)020A(2)E080  |                                 | 30.0                          | 8.0                   | 80                                | 1581  | 1423 | 632   |
| 25 Volt Rating @ +85°C (17 Volt Rating at +125°C) |           |                         |                                 |                               |                       |                                   |   |      |       |
| 0.47  | A         | T495A474(1)025A(2)E4K5  |                                 | 0.5                           | 4.0                   | 4500                              | 129   | 116  | 52    |
| 2.2   | C         | T495C225(1)025A(2)E1K3  |                                 | 0.6                           | 6.0                   | 1300                              | 291   | 262  | 116   |
| 3.3   | C         | T495C335(1)025A(2)E750  |                                 | 0.9                           | 6.0                   | 750                               | 383   | 345  | 153   |
| 4.7   | C         | T495C475(1)025A(2)E575  |                                 | 1.2                           | 6.0                   | 575                               | 437   | 394  | 175   |
| 6.8   | B         | T495B685(1)025A(2)E1K5  |                                 | 1.7                           | 6.0                   | 1500                              | 238   | 214  | 95    |
| 6.8   | C         | T495C685(1)025A(2)E400  |                                 | 1.7                           | 6.0                   | 400                               | 524   | 472  | 210   |
| 6.8   | C         | T495C685(1)025A(2)E490  |                                 | 1.7                           | 6.0                   | 490                               | 474   | 426  | 190   |
| 6.8   | C         | T495C685(1)025A(2)E500  |                                 | 1.7                           | 6.0                   | 500                               | 469   | 422  | 188   |
| 10.0  | C         | T495C106(1)025A(2)E275  |                                 | 2.5                           | 6.0                   | 275                               | 632   | 569  | 253   |
| 10.0  | C         | T495C106(1)025A(2)E300  |                                 | 2.5                           | 6.0                   | 300                               | 606   | 545  | 242   |
| 10.0  | C         | T495C106(1)025A(2)E450  |                                 | 2.5                           | 6.0                   | 450                               | 494   | 445  | 198   |
| 15.0  | D         | T495D156(1)025A(2)E100  |                                 | 3.8                           | 6.0                   | 100                               | 1225  | 1102 | 490   |
| 15.0  | D         | T495D156(1)025A(2)E275  |                                 | 3.8                           | 6.0                   | 275                               | 738   | 665  | 295   |
| 15.0  | X         |                         |                                 |                               |                       |                                   |   |      |       |

# SOLID TANTALUM CHIP CAPACITORS

## T495 SERIES—Low ESR, Surge Robust

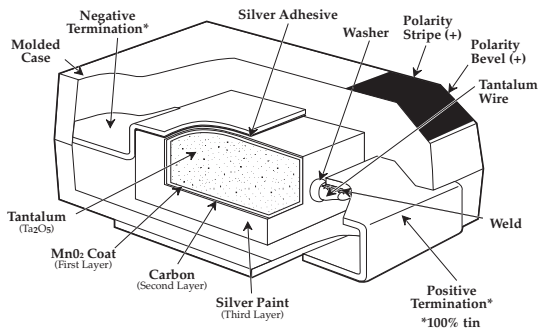
### T495 RATINGS & PART NUMBER REFERENCE

| Capacitance $\mu\text{F}$                                | Case Size | KEMET Part Number      | DSCC Dwg. No. 95158 Part Number | DC Leakage $\mu\text{A}$ @ 25°C Max | DF% @ 25°C 120 Hz Max | ESR m $\Omega$ @ 25°C 100 kHz Max | Ripple Current mA rms @ |      |       |
|--|-----------|------------------------|---------------------------------|-------------------------------------|-----------------------|-----------------------------------|-------------------------|------|-------|
|  |           |                        |                                 |                                     |                       |                                   | 25°C                    | 85°C | 125°C |
| <b>25 Volt Rating @ +85°C (17 Volt Rating at +125°C)</b> |           |                        |                                 |                                     |                       |                                   |                         |      |       |
| 68.0   | D         | T495D686(1)025A(2)E150 |                                 | 17.0                                | 10.0                  | 150                               | 1000                    | 900  | 400   |
| 68.0   | D         | T495D686(1)025A(2)E200 |                                 | 17.0                                | 10.0                  | 200                               | 866                     | 779  | 346   |
| 68.0   | X         | T495X686(1)025A(2)E125 |                                 | 17.0                                | 8.0                   | 125                               | 1149                    | 1034 | 460   |
| 68.0   | X         | T495X686(1)025A(2)E150 |                                 | 17.0                                | 8.0                   | 150                               | 1049                    | 944  | 420   |
| 68.0   | X         | T495X686(1)025A(2)E200 |                                 | 17.0                                | 8.0                   | 200                               | 908                     | 817  | 363   |
| 100.0  | E         | T495E107(1)025A(2)E100 |                                 | 25.0                                | 8.0                   | 100                               | 1414                    | 1273 | 566   |
| <b>35 Volt Rating @ +85°C (23 Volt Rating at +125°C)</b> |           |                        |                                 |                                     |                       |                                   |                         |      |       |
| 0.47   | B         | T495B474(1)035A(2)E1K5 |                                 | 0.5                                 | 4.0                   | 1500                              | 238                     | 214  | 95    |
| 0.47   | B         | T495B474(1)035A(2)E2K2 |                                 | 0.5                                 | 4.0                   | 2200                              | 197                     | 177  | 79    |
| 1.0  | A         | T495A105(1)035A(2)E3K0 |                                 | 0.4                                 | 4.0                   | 3000                              | 158                     | 142  | 63    |
| 1.0  | B         | T495B105(1)035A(2)E1K5 |                                 | 0.5                                 | 4.0                   | 1500                              | 238                     | 214  | 95    |
| 1.0  | B         | T495B105(1)035A(2)E1K7 |                                 | 0.5                                 | 4.0                   | 1700                              | 224                     | 201  | 89    |
| 2.2  | B         | T495B225(1)035A(2)E1K5 |                                 | 0.8                                 | 6.0                   | 1500                              | 238                     | 214  | 95    |
| 2.2  | C         | T495C225(1)035A(2)E750 |                                 | 0.8                                 | 6.0                   | 750                               | 383                     | 345  | 153   |
| 3.3  | B         | T495B335(1)035A(2)E900 |                                 | 1.2                                 | 6.0                   | 900                               | 307                     | 276  | 123   |
| 3.3  | C         | T495C335(1)035A(2)E525 |                                 | 1.1                                 | 6.0                   | 525                               | 457                     | 411  | 182   |
| 3.3  | C         | T495C335(1)035A(2)E550 |                                 | 1.1                                 | 6.0                   | 550                               | 447                     | 402  | 178   |
| 3.3  | C         | T495C335(1)035A(2)E600 |                                 | 1.2                                 | 6.0                   | 600                               | 428                     | 385  | 171   |
| 4.7  | B         | T495B475(1)035A(2)E1K0 |                                 | 1.6                                 | 6.0                   | 1000                              | 292                     | 262  | 117   |
| 4.7  | C         | T495C475(1)035A(2)E450 |                                 | 1.7                                 | 6.0                   | 450                               | 494                     | 445  | 198   |
| 4.7  | C         | T495C475(1)035A(2)E500 |                                 | 1.7                                 | 6.0                   | 500                               | 469                     | 422  | 188   |
| 4.7  | C         | T495C475(1)035A(2)E600 |                                 | 1.7                                 | 6.0                   | 600                               | 428                     | 385  | 171   |
| 4.7  | C         | T495C475(1)035A(2)4095 | 95158-29(1)(2)                  | 1.7                                 | 6.0                   | 600                               | 428                     | 385  | 171   |
| 6.8  | D         | T495D685(1)035A(2)E150 |                                 | 2.4                                 | 6.0                   | 150                               | 1000                    | 900  | 400   |
| 6.8  | D         | T495D685(1)035A(2)E400 |                                 | 2.4                                 | 6.0                   | 400                               | 612                     | 551  | 245   |
| 6.8  | X         | T495X685(1)035A(2)E300 |                                 | 1.9                                 | 4.0                   | 300                               | 742                     | 667  | 297   |
| 6.8  | X         | T495X685(1)035A(2)4095 | 95158-20(1)(2)                  | 1.9                                 | 4.0                   | 300                               | 742                     | 667  | 297   |
| 10.0   | D         | T495D106(1)035A(2)E125 |                                 | 3.5                                 | 6.0                   | 125                               | 1095                    | 986  | 438   |
| 10.0   | D         | T495D106(1)035A(2)E250 |                                 | 3.5                                 | 6.0                   | 250                               | 775                     | 697  | 310   |
| 10.0   | D         | T495D106(1)035A(2)E300 |                                 | 3.5                                 | 6.0                   | 300                               | 707                     | 636  | 283   |
| 10.0   | D         | T495D106(1)035A(2)4095 | 95158-27(1)(2)                  | 3.5                                 | 6.0                   | 300                               | 707                     | 636  | 283   |
| 10.0   | X         | T495X106(1)035A(2)E175 |                                 | 3.5                                 | 6.0                   | 175                               | 971                     | 874  | 388   |
| 10.0   | X         | T495X106(1)035A(2)E200 |                                 | 3.5                                 | 6.0                   | 200                               | 908                     | 817  | 363   |
| 10.0   | X         | T495X106(1)035A(2)E250 |                                 | 2.8                                 | 4.0                   | 250                               | 812                     | 731  | 325   |
| 10.0   | X         | T495X106(1)035A(2)4095 | 95158-21(1)(2)                  | 2.8                                 | 4.0                   | 250                               | 812                     | 731  | 325   |
| 15.0   | D         | T495D156(1)035A(2)E225 |                                 | 5.3                                 | 6.0                   | 225                               | 816                     | 735  | 327   |
| 15.0   | D         | T495D156(1)035A(2)E300 |                                 | 5.3                                 | 6.0                   | 300                               | 707                     | 636  | 283   |
| 15.0   | X         | T495X156(1)035A(2)E200 |                                 | 5.3                                 | 6.0                   | 200                               | 908                     | 817  | 363   |
| 15.0   | X         | T495X156(1)035A(2)E225 |                                 | 5.3                                 | 6.0                   | 225                               | 856                     | 771  | 343   |
| 15.0   | X         | T495X156(1)035A(2)4095 | 95158-22(1)(2)                  | 5.3                                 | 6.0                   | 225                               | 856                     | 771  | 343   |
| 22.0   | D         | T495D226(1)035A(2)E125 |                                 | 7.7                                 | 6.0                   | 125                               | 1095                    | 985  | 438   |
| 22.0   | D         | T495D226(1)035A(2)E200 |                                 | 7.7                                 | 6.0                   | 200                               | 866                     | 779  | 346   |
| 22.0   | D         | T495D226(1)035A(2)E250 |                                 | 7.7                                 | 6.0                   | 250                               | 775                     | 697  | 310   |
| 22.0   | D         | T495D226(1)035A(2)E300 |                                 | 7.7                                 | 6.0                   | 300                               | 707                     | 636  | 283   |
| 22.0   | X         | T495X226(1)035A(2)E125 |                                 | 7.7                                 | 6.0                   | 125                               | 1149                    | 1034 | 460   |
| 22.0   | X         | T495X226(1)035A(2)E200 |                                 | 7.7                                 | 6.0                   | 200                               | 908                     | 817  | 363   |
| 22.0   | X         | T495X226(1)035A(2)E275 |                                 | 7.7                                 | 6.0                   | 275                               | 775                     | 697  | 410   |
| 22.0   | X         | T495X226(1)035A(2)4095 | 95158-23(1)(2)                  | 7.7                                 | 6.0                   | 300                               | 742                     | 667  | 297   |
| 33.0   | X         | T495X336(1)035A(2)E100 |                                 | 11.6                                | 6.0                   | 100                               | 1285                    | 1156 | 514   |
| 33.0   | X         | T495X336(1)035A(2)E175 |                                 | 11.6                                | 6.0                   | 175                               | 971                     | 874  | 388   |
| 33.0   | X         | T495X336(1)035A(2)E250 |                                 | 11.6                                | 6.0                   | 250                               | 812                     | 731  | 325   |
| 33.0   | X         | T495E336(1)035A(2)E200 |                                 | 11.6                                | 6.0                   | 200                               | 1000                    | 900  | 400   |
| 47.0   | X         | T495X476(1)035A(2)E185 |                                 | 16.5                                | 8.0                   | 185                               | 944                     | 850  | 378   |
| 47.0   | X         | T495X476(1)035A(2)E200 |                                 | 16.5                                | 8.0                   | 200                               | 908                     | 817  | 363   |
| 47.0   | X         | T495X476(1)035A(2)E300 |                                 | 16.5                                | 8.0                   | 300                               | 742                     | 667  | 297   |
| <b>50 Volt Rating @ +85°C (33 Volt Rating at +125°C)</b> |           |                        |                                 |                                     |                       |                                   |                         |      |       |
| 1.0  | C         | T495C105(1)050A(2)E1K3 |                                 | 0.5                                 | 4.0                   | 1300                              | 291                     | 262  | 116   |
| 2.2  | D         | T495D225(1)050A(2)E600 |                                 | 1.1                                 | 6.0                   | 600                               | 500                     | 450  | 200   |
| 3.3  | D         | T495D335(1)050A(2)E700 |                                 | 1.7                                 | 6.0                   | 700                               | 463                     | 417  | 185   |
| 4.7  | D         | T495D475(1)050A(2)E275 |                                 | 2.4                                 | 6.0                   | 275                               | 739                     | 665  | 295   |
| 4.7  | D         | T495D475(1)050A(2)E300 |                                 | 2.4                                 | 6.0                   | 300                               | 707                     | 636  | 283   |
| 4.7  | X         | T495X475(1)050A(2)E300 |                                 | 1.9                                 | 4.0                   | 300                               | 742                     | 667  | 297   |
| 4.7  | X         | T495X475(1)050A(2)4095 | 95158-24(1)(2)                  | 1.9                                 | 4.0                   | 300                               | 742                     | 667  | 297   |
| 6.8  | D         | T495D685(1)050A(2)E190 |                                 | 3.4                                 | 6.0                   | 190                               | 888                     | 799  | 355   |
| 6.8  | D         | T495D685(1)050A(2)E200 |                                 | 3.4                                 | 6.0                   | 200                               | 866                     | 779  | 346   |
| 6.8  | D         | T495D685(1)050A(2)E275 |                                 | 3.4                                 | 6.0                   | 275                               | 739                     | 665  | 295   |
| 6.8  | D         | T495D685(1)050A(2)E300 |                                 | 3.4                                 | 8.0                   | 300                               | 700                     | 600  | 300   |
| 10.0   | X         | T495X106(1)050A(2)E250 |                                 | 5.0                                 | 8.0                   | 250                               | 774                     | 697  | 309   |
| 10.0   | X         | T495X106(1)050A(2)E260 |                                 | 5.0                                 | 6.0                   | 260                               | 796                     | 716  | 318   |
| 10.0   | X         | T495X106(1)050A(2)E300 |                                 | 5.0                                 | 6.0                   | 300                               | 741                     | 667  | 297   |
| 15.0   | X         | T495X156(1)050A(2)E200 |                                 | 7.5                                 | 8.0                   | 200                               | 908                     | 817  | 363   |
| 15.0   | X         | T495X156(1)050A(2)E300 |                                 | 7.5                                 | 8.0                   | 300                               | 742                     | 667  | 297   |

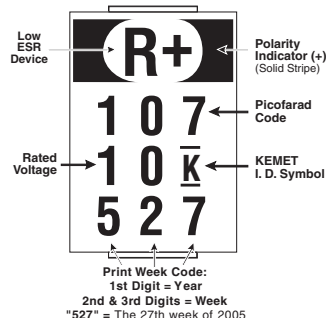
- (1) To complete KEMET part number, insert "K" for  $\pm 10\%$  or "M" for  $\pm 20\%$  capacitance tolerance.  
 (2) To complete KEMET part number, insert lead material designations per Ordering Information on page 31.  
 \*Extended Values

Higher voltage ratings and tighter capacitance tolerance product may be substituted within the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage rating.

### CONSTRUCTION



### CAPACITOR MARKINGS





## T495 TANTALUM CHIP CAPACITANCE VALUES

Case Size and Max. ESR (mΩ) by Capacitance & Voltage  
Standard Capacitance Values

| Capacitance |      | Rated Voltage @ +85°C |                          |  |   |                                    |                                       |                                    |   |                        |
|-------------|------|-----------------------|--------------------------|--|---|------------------------------------|---------------------------------------|------------------------------------|---|------------------------|
| μF          | Code | 2.5                   | 4                        | 6  | 10  | 16                                 | 20                                    | 25                                 | 35  | 50                     |
| 0.47        | 474  |                       |                          |  |   |                                    |                                       | A,4500                             | B,1500<br>B,2200                            |                        |
| 1.0         | 105  |                       |                          |  |   |                                    | A,3000                                |                                    | A,3000<br>B,1500<br>B,1700                  | C,1300                 |
| 2.2         | 225  |                       |                          |  |   | A,1800                             |                                       | C,1300                             | B,1500<br>C,750                             | D,600                  |
| 3.3         | 335  |                       |                          |  |   | A,3000                             |                                       | C,750                              | B,900<br>C,525,550,600                      | D,700                  |
| 4.7         | 475  |                       |                          |  | A,1300<br>B,1300  | A,2000<br>B,700                    |                                       | C,575                              | B,1000<br>C,450,500<br>C,600                | D,275,300<br>X,300     |
| 6.8         | 685  |                       |                          |  | A,1800<br>B,900   | C,750                              |                                       | B,1500<br>C,400,490,500            | D,400<br>X,300                              | D,190,200,275<br>D,300 |
| 10.0        | 106  |                       |                          |  | A,1800<br>B,750   | A,1700<br>T,4000                   | B,1000<br>C,400,475                   | B,750<br>C,450                     | D,120,125,250D<br>300<br>X,175,200<br>X,250 | X,250,300              |
| 15.0        | 156  |                       |                          |  | B,500<br>C,375,400,475  | A,2500<br>B,800                    | C,375<br>D,275                        | D,100,275<br>X,200                 | C,350<br>D,225,300<br>X,200,225             | X,300                  |
| 22.0        | 226  |                       |                          | A,900  | B,500<br>C,290,345  | B,600                              | D,180,225<br>D,275                    | C,300,900<br>D,200<br>X,225        | D,125,200,250<br>D300<br>X,125,200,275,300  |                        |
| 33.0        | 336  |                       |                          |  | B,450<br>V,100,150  | C,200,225,275<br>D,150,175,225,250 | D,100,150<br>200                      | D,90,100<br>D,225,300<br>X,100,175 | D,300<br>X,100,175,250<br>E,200             |                        |
| 47.0        | 476  |                       |                          | B,450<br>C,250<br>V,150                                  | B,500<br>D,80,90,200  | C,350<br>D,100,150,200             | D,75,100,175<br>X,65,100<br>X,125,150 | D,120,250<br>X,80,150,185,200      | X,185,200,300                               |                        |
| 68.0        | 686  |                       | V,150                    | D,175  | V,70,100,140<br>B,600,750<br>B,900<br>C,80,225<br>D,90,150<br>X,150 | V,180,300<br>D,150                 | D,70,150<br>X,120,150                 | X,125,150<br>200                   |   |                        |
| 100.0       | 107  | T,3000                | B,500                    | V,90,150<br>B,400,700<br>C,75,150<br>D,150               | C,100<br>V,100,150<br>D,50,65,80,100<br>X,100                       | D,100,125<br>X,80,100,125          | X,150<br>E,60,85,100<br>200           | E,100                              |   |                        |
| 150.0       | 157  |                       | B,900<br>C,70,250        | V,40,70<br>C,50,200<br>X,100,125                         | C,200<br>D,50,60,80,100<br>X,70,80,85,100<br>V,100,150              | D,100,125,150<br>X,75,100          | E,80                                  |                                    |   |                        |
| 220.0       | 227  | D,45                  |                          | C,225<br>D,45,100<br>X,70,100                            | V,150<br>D,45,75<br>D,100,125<br>X,45,50,60,70,100                  | X,100<br>E,50,100,150              |                                       |                                    |   |                        |
| 330.0       | 337  |                       | C,300,700<br>D,30,45     | X,45,65,<br>X,100<br>D,40,50,70,<br>D,100<br>E,40,60,100 | D,100,125<br>X,35,50,60<br>E,40,60,100                              |                                    |                                       |                                    |   |                        |
| 470.0       | 477  | D,35                  | D,45,100<br>X,30,45,100  | X,30,45,50,<br>X,65<br>D,45,100,125<br>E,40,55,100       | X,45,50<br>E,40,60,100  |                                    |                                       |                                    |   |                        |
| 680.0       | 687  |                       |                          |  |   |                                    |                                       |                                    |   |                        |
| 1000.0      | 108  | X,30,40               | X,30,40,60,70<br>E,35,50 | E,50   |   |                                    |                                       |                                    |   |                        |

Note that standard values are preferred, especially where high surge currents are possible. Extended values are available to increase capacitance and reduce ESR. Note that standard CV values demonstrate inherently lower failure rates than extended CV values, especially in low impedance applications.

## T495 TANTALUM CHIP CAPACITANCE VALUES

Case Size and Max. ESR (mΩ) by Capacitance & Voltage  
Standard Capacitance Values

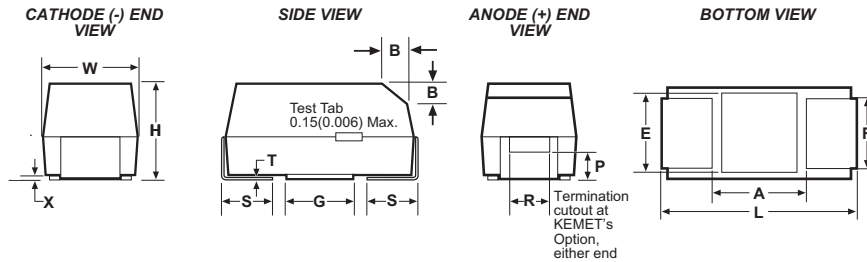
| Capacitance |      | Rated Voltage @ +85°C |                          |  |   |                                    |                                       |                                    |   |                        |
|-------------|------|-----------------------|--------------------------|--|---|------------------------------------|---------------------------------------|------------------------------------|---|------------------------|
| μF          | Code | 2.5                   | 4                        | 6  | 10  | 16                                 | 20                                    | 25                                 | 35  | 50                     |
| 0.47        | 474  |                       |                          |  |   |                                    |                                       | A,4500                             | B,1500<br>B,2200                            |                        |
| 1.0         | 105  |                       |                          |  |   |                                    | A,3000                                |                                    | A,3000<br>B,1500<br>B,1700                  | C,1300                 |
| 2.2         | 225  |                       |                          |  |   | A,1800                             |                                       | C,1300                             | B,1500<br>C,750                             | D,600                  |
| 3.3         | 335  |                       |                          |  |   | A,3000                             |                                       | C,750                              | B,900<br>C,525,550,600                      | D,700                  |
| 4.7         | 475  |                       |                          |  | A,1300<br>B,1300  | A,2000<br>B,700                    |                                       | C,575                              | B,1000<br>C,450,500<br>C,600                | D,275,300<br>X,300     |
| 6.8         | 685  |                       |                          |  | A,1800<br>B,900   | C,750                              |                                       | B,1500<br>C,400,490,500            | D,400<br>X,300                              | D,190,200,275<br>D,300 |
| 10.0        | 106  |                       |                          |  | A,1800<br>B,750   | A,1700<br>T,4000                   | B,1000<br>C,400,475                   | B,750<br>C,450                     | D,120,125,250D<br>300<br>X,175,200<br>X,250 | X,250,300              |
| 15.0        | 156  |                       |                          |  | B,500<br>C,375,400,475  | A,2500<br>B,800                    | C,375<br>D,275                        | D,100,275<br>X,200                 | C,350<br>D,225,300<br>X,200,225             | X,300                  |
| 22.0        | 226  |                       |                          | A,900  | B,500<br>C,290,345  | B,600                              | D,180,225<br>D,275                    | C,300,900<br>D,200<br>X,225        | D,125,200,250<br>D300<br>X,125,200,275,300  |                        |
| 33.0        | 336  |                       |                          |  | B,450<br>V,100,150  | C,200,225,275<br>D,150,175,225,250 | D,100,150<br>200                      | D,90,100<br>D,225,300<br>X,100,175 | D,300<br>X,100,175,250<br>E,200             |                        |
| 47.0        | 476  |                       |                          | B,450<br>C,250<br>V,150                                  | B,500<br>D,80,90,200  | C,350<br>D,100,150,200             | D,75,100,175<br>X,65,100<br>X,125,150 | D,120,250<br>X,80,150,185,200      | X,185,200,300                               |                        |
| 68.0        | 686  |                       | V,150                    | D,175  | V,70,100,140<br>B,600,750<br>B,900<br>C,80,225<br>D,90,150<br>X,150 | V,180,300<br>D,150                 | D,70,150<br>X,120,150                 | X,125,150<br>200                   |   |                        |
| 100.0       | 107  | T,3000                | B,500                    | V,90,150<br>B,400,700<br>C,75,150<br>D,150               | C,100<br>V,100,150<br>D,50,65,80,100<br>X,100                       | D,100,125<br>X,80,100,125          | X,150<br>E,60,85,100<br>200           | E,100                              |   |                        |
| 150.0       | 157  |                       | B,900<br>C,70,250        | V,40,70<br>C,50,200<br>X,100,125                         | C,200<br>D,50,60,80,100<br>X,70,80,85,100<br>V,100,150              | D,100,125,150<br>X,75,100          | E,80                                  |                                    |   |                        |
| 220.0       | 227  | D,45                  |                          | C,225<br>D,45,100<br>X,70,100                            | V,150<br>D,45,75<br>D,100,125<br>X,45,50,60,70,100                  | X,100<br>E,50,100,150              |                                       |                                    |   |                        |
| 330.0       | 337  |                       | C,300,700<br>D,30,45     | X,45,65,<br>X,100<br>D,40,50,70,<br>D,100<br>E,40,60,100 | D,100,125<br>X,35,50,60<br>E,40,60,100                              |                                    |                                       |                                    |   |                        |
| 470.0       | 477  | D,35                  | D,45,100<br>X,30,45,100  | X,30,45,50,<br>X,65<br>D,45,100,125<br>E,40,55,100       | X,45,50<br>E,40,60,100  |                                    |                                       |                                    |   |                        |
| 680.0       | 687  |                       |                          |  |   |                                    |                                       |                                    |   |                        |
| 1000.0      | 108  | X,30,40               | X,30,40,60,70<br>E,35,50 | E,50   |   |                                    |                                       |                                    |   |                        |

Note that standard values are preferred, especially where high surge currents are possible. Extended values are available to increase capacitance and reduce ESR. Note that standard CV values demonstrate inherently lower failure rates than extended CV values, especially in low impedance applications.

### FEATURES

- Built-in fuse protects against damaging short circuit failure mode
- Precision-molded, laser-marked case
- Symmetrical, compliant terminations
- Taped and reeled per EIA 481-1
- Case geometry and footprints equivalent to Industrial Grade T491 Series. (Case sizes B, C, D and X only)
- 100% Surge Current test on C, D, X sizes
- Patented fuse assembly
- Operating Temperature: -55°C to +125°C
- Fuse actuation, 25°C: within 1 second at fault currents of 4 amps and higher.
- Continuous current capability: 0.75 amps
- Post-actuation resistance, 25°C: 10 megohms minimum
- Test tabs on the sides of the case bypass the capacitor element to allow direct testing of the fuse assembly.
- RoHS Compliant & Leadfree Terminations (See www.kemet.com for lead transition)

### OUTLINE DRAWINGS



### DIMENSIONS — Millimeters (Inches)

| Case Size |         | Component                  |                            |                            |                      |                      |                          |                              |               |               |                |               |               |               |
|-----------|---------|----------------------------|----------------------------|----------------------------|----------------------|----------------------|--------------------------|------------------------------|---------------|---------------|----------------|---------------|---------------|---------------|
| KEMET     | EIA     | L*                         | W*                         | H*                         | F* ± 0.1<br>± (.004) | S* ± 0.3<br>± (.012) | B ± 0.15<br>(Ref) ± .006 | X<br>(Ref)                   | P<br>(Ref)    | R<br>(Ref)    | T<br>(Ref)     | A<br>(Min)    | G<br>(Ref)    | E<br>(Ref)    |
| B         | 3528-21 | 3.5 ± 0.2<br>(.138 ± .008) | 2.8 ± 0.2<br>(.110 ± .008) | 1.9 ± 0.2<br>(.075 ± .008) | 2.2<br>(.087)        | 0.8<br>(.031)        | 0.4<br>(.016)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.5<br>(.020) | 1.0<br>(.039) | 0.13<br>(.005) | 1.1<br>(.043) | 1.8<br>(.071) | 2.2<br>(.087) |
| C         | 6032-28 | 6.0 ± 0.3<br>(.236 ± .012) | 3.2 ± 0.3<br>(.126 ± .012) | 2.5 ± 0.3<br>(.098 ± .012) | 2.2<br>(.087)        | 1.3<br>(.051)        | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.9<br>(.035) | 1.0<br>(.039) | 0.13<br>(.005) | 3.1<br>(.122) | 2.8<br>(.110) | 2.4<br>(.094) |
| D         | 7343-31 | 7.3 ± 0.3<br>(.287 ± .012) | 4.3 ± 0.3<br>(.169 ± .012) | 2.8 ± 0.3<br>(.110 ± .012) | 2.4<br>(.094)        | 1.3<br>(.051)        | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 0.9<br>(.035) | 1.0<br>(.039) | 0.13<br>(.005) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |
| X         | 7343-43 | 7.3 ± 0.3<br>(.287 ± .012) | 4.3 ± 0.3<br>(.169 ± .012) | 4.0 ± 0.3<br>(.157 ± .012) | 2.4<br>(.094)        | 1.3<br>(.051)        | 0.5<br>(.020)            | 0.10 ± 0.10<br>(.004 ± .004) | 1.7<br>(.067) | 1.0<br>(.039) | 0.13<br>(.005) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |

Notes: 1. Metric dimensions govern  
 2. (Ref) Dimensions provided for reference only  
 \* Round glue pad: 2.9 ± 0.1mm (.114" ± .004") in diameter at KEMET's option.

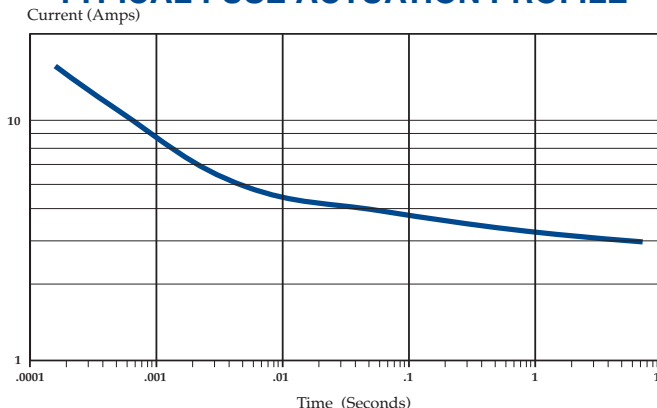
### T496 Series – ORDERING INFORMATION

**Tantalum** — T  
**Series** — 496  
 T496 - Precision Molded, Fail-safe  
**Case Size** — B  
 B, C, D, X  
**Capacitance Picofarad Code** — 105  
 First two digits represent significant figures. Third digit specifies number of zeros to follow.  
**Capacitance Tolerance** — M  
 M = ±20%, K = ±10%

**025**  
**A**  
**T**  
**E3K5**  
**ESR**  
 E100 = ESR in Milliohms = 100 mOhms  
 E3K5 = ESR in Ohms = 3.5 Ohms  
**Lead Material**  
 T = 100% Tin (Sn) Plated  
 H = (Sn) Solder-Coated (90% Sn/10% Pb)  
**Failure Rate**  
 A = Not Applicable  
**Voltage**

\*Part number example: T496B105M025AT (14 digits - no spaces). See www.kemet.com for Pb Free transition.  
 \*\* "S" Termination codes are converting from 90Sn/10 Pb to 100% tin finishes. Orders including "S" suffix termination codes do not guarantee Pb-free product.

### TYPICAL FUSE ACTUATION PROFILE



### T496 RATINGS & PART NUMBER REFERENCE

| Capacitance $\mu\text{F}$                                   | Case Size | KEMET Part Number       | DCL $\mu\text{A}$ @ 25°C Max. | DF% @ +25°C 120 Hz. Max. | ESR $\Omega$ @ +25°C 100 kHz Max. |
|---|-----------|-------------------------|-------------------------------|--------------------------|-----------------------------------|
| <b>4 Volt Rating at +85°C (2.7 Volt Rating at +125°C)</b>   |           |                         |                               |                          |                                   |
| 68.0  | C         | T496C686(1)004A(2) E1K6 | 2.7                           | 6.0                      | 1.6                               |
| 68.0  | C         | T496C686(1)004A(2) E400 | 2.7                           | 6.0                      | 0.4                               |
| 100.0   | C         | T496C107(1)004A(2) E1K2 | 4.0                           | 8.0                      | 1.2                               |
| 150.0   | D         | T496D157(1)004A(2) E800 | 6.0                           | 8.0                      | 0.8                               |
| 150.0   | C         | T496C157(1)004A(2) E1K2 | 6.0                           | 8.0                      | 1.2                               |
| 220.0   | D         | T496D227(1)004A(2) E700 | 8.8                           | 8.0                      | 0.7                               |
| 220.0   | D         | T496D227(1)004A(2) E400 | 8.8                           | 8.0                      | 0.4                               |
| #330.0  | D         | T496D337(1)004A(2) E700 | 13.2                          | 8.0                      | 0.7                               |
| #330.0  | D         | T496D337(1)004A(2) E400 | 13.2                          | 8.0                      | 0.4                               |
| 330.0   | X         | T496X337(1)004A(2) E700 | 13.2                          | 8.0                      | 0.7                               |
| #470.0  | X         | T496X477(1)004A(2) E500 | 18.8                          | 8.0                      | 0.5                               |
| <b>**6.3 Volt Rating at +85°C (4 Volt Rating at +125°C)</b> |           |                         |                               |                          |                                   |
| 4.7   | B         | T496B475(1)006A(2) E3K5 | 0.5                           | 6.0                      | 3.5                               |
| 6.8   | B         | T496B685(1)006A(2) E3K5 | 0.5                           | 6.0                      | 3.5                               |
| 10.0  | B         | T496B106(1)006A(2) E3K5 | 0.6                           | 6.0                      | 3.5                               |
| 15.0  | C         | T496C156(1)006A(2) E2K0 | 0.9                           | 6.0                      | 2.0                               |
| 22.0  | B         | T496B226(1)006A(2) E3K5 | 1.3                           | 6.0                      | 3.5                               |
| 22.0  | B         | T496B226(1)006A(2) E1K5 | 1.3                           | 6.0                      | 1.5                               |
| 22.0  | C         | T496C226(1)006A(2) E2K0 | 1.4                           | 6.0                      | 2.0                               |
| 33.0  | C         | T496C336(1)006A(2) E2K0 | 2.0                           | 6.0                      | 2.0                               |
| 33.0  | C         | T496C336(1)006A(2) E600 | 2.0                           | 6.0                      | 0.6                               |
| 47.0  | C         | T496C476(1)006A(2) E1K6 | 2.9                           | 6.0                      | 1.6                               |
| 47.0  | C         | T496C476(1)006A(2) E600 | 2.9                           | 6.0                      | 0.6                               |
| 47.0  | D         | T496D476(1)006A(2) E1K0 | 2.9                           | 6.0                      | 1.0                               |
| #68.0   | C         | T496C686(1)006A(2) E1K2 | 4.1                           | 6.0                      | 1.2                               |
| 68.0  | D         | T496D686(1)006A(2) E1K0 | 4.1                           | 6.0                      | 1.0                               |
| 100.0   | X         | T496X107(1)006A(2) E900 | 6.0                           | 8.0                      | 0.9                               |
| 100.0   | X         | T496X107(1)006A(2) E300 | 6.0                           | 8.0                      | 0.3                               |
| 100.0   | D         | T496D107(1)006A(2) E800 | 6.0                           | 8.0                      | 0.8                               |
| 100.0   | D         | T496D107(1)006A(2) E400 | 6.0                           | 8.0                      | 0.4                               |
| #100  | C         | T496C107(1)006A(2) E400 | 6.0                           | 8.0                      | 0.4                               |
| 150.0   | X         | T496X157(1)006A(2) E300 | 9.0                           | 8.0                      | 0.3                               |
| 150.0   | D         | T496D157(1)006A(2) E700 | 9.0                           | 8.0                      | 0.7                               |
| 150.0   | D         | T496D157(1)006A(2) E300 | 9.0                           | 8.0                      | 0.3                               |
| 220.0   | X         | T496X227(1)006A(2) E700 | 13.2                          | 8.0                      | 0.7                               |
| 220.0   | X         | T496X227(1)006A(2) E300 | 13.2                          | 8.0                      | 0.3                               |
| #220.0  | D         | T496D227(1)006A(2) E700 | 13.2                          | 8.0                      | 0.7                               |
| #220.0  | D         | T496D227(1)006A(2) E300 | 13.2                          | 8.0                      | 0.3                               |
| #330.0  | X         | T496X337(1)006A(2) E500 | 19.8                          | 8.0                      | 0.5                               |
| #330.0  | X         | T496X337(1)006A(2) E300 | 19.8                          | 8.0                      | 0.3                               |
| <b>10 Volt Rating at +85°C (7 Volt Rating at +125°C)</b>    |           |                         |                               |                          |                                   |
| 3.3   | B         | T496B335(1)010A(2) E3K5 | 0.5                           | 6.0                      | 3.5                               |
| 4.7   | B         | T496B475(1)010A(2) E3K5 | 0.5                           | 6.0                      | 3.5                               |
| 6.8   | B         | T496B685(1)010A(2) E3K5 | 0.7                           | 6.0                      | 3.5                               |
| 10.0  | C         | T496C106(1)010A(2) E2K0 | 1.0                           | 6.0                      | 2.0                               |
| 15.0  | B         | T496B156(1)010A(2) E3K5 | 1.5                           | 6.0                      | 3.5                               |
| 15.0  | C         | T496C156(1)010A(2) E2K0 | 1.5                           | 6.0                      | 2.0                               |
| 15.0  | C         | T496C156(1)010A(2) E600 | 1.5                           | 6.0                      | 0.6                               |
| 22.0  | C         | T496C226(1)010A(2) E2K0 | 2.2                           | 6.0                      | 2.0                               |
| 22.0  | C         | T496C226(1)010A(2) E500 | 2.2                           | 6.0                      | 0.5                               |
| 33.0  | D         | T496D336(1)010A(2) E1K0 | 3.3                           | 6.0                      | 1.0                               |
| 33.0  | D         | T496D336(1)010A(2) E400 | 3.3                           | 6.0                      | 0.4                               |
| 33.0  | C         | T496C336(1)010A(2) E1K6 | 3.3                           | 6.0                      | 1.6                               |
| 33.0  | C         | T496C336(1)010A(2) E400 | 3.3                           | 6.0                      | 0.4                               |

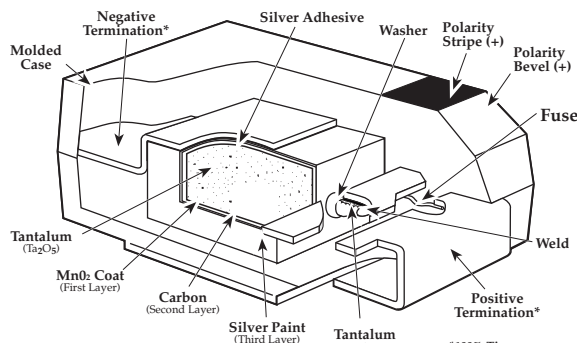
| Capacitance $\mu\text{F}$                                      | Case Size | KEMET Part Number       | DCL $\mu\text{A}$ @ 25°C Max. | DF% @ +25°C 120 Hz. Max. | ESR $\Omega$ @ +25°C 100 kHz Max. |
|--|-----------|-------------------------|-------------------------------|--------------------------|-----------------------------------|
| <b>10 Volt Rating at +85°C (7 Volt Rating at +125°C) cont.</b> |           |                         |                               |                          |                                   |
| 47.0   | D         | T496D476(1)010A(2) E1K0 | 4.7                           | 6.0                      | 1.0                               |
| 47.0   | D         | T496D476(1)010A(2) E400 | 4.7                           | 6.0                      | 0.4                               |
| #47.0  | C         | T496C476(1)010A(2) E1K2 | 4.7                           | 6.0                      | 1.2                               |
| #47.0  | C         | T496C476(1)010A(2) E400 | 4.7                           | 6.0                      | 0.4                               |
| 68.0   | X         | T496X686(1)010A(2) E900 | 6.8                           | 6.0                      | 0.9                               |
| 68.0   | D         | T496D686(1)010A(2) E800 | 6.8                           | 6.0                      | 0.8                               |
| 68.0   | D         | T496D686(1)010A(2) E400 | 6.8                           | 6.0                      | 0.4                               |
| 100.0  | X         | T496X107(1)010A(2) E400 | 10.0                          | 8.0                      | 0.4                               |
| 100.0  | D         | T496D107(1)010A(2) E700 | 10.0                          | 8.0                      | 0.7                               |
| 100.0  | D         | T496D107(1)010A(2) E400 | 10.0                          | 8.0                      | 0.4                               |
| 150.0  | X         | T496X157(1)010A(2) E700 | 15.0                          | 8.0                      | 0.7                               |
| 150.0  | X         | T496X157(1)010A(2) E400 | 15.0                          | 8.0                      | 0.4                               |
| #150.0   | D         | T496D157(1)010A(2) E700 | 15.0                          | 8.0                      | 0.7                               |
| #150.0   | D         | T496D157(1)010A(2) E400 | 15.0                          | 8.0                      | 0.4                               |
| #220.0   | X         | T496X227(1)010A(2) E500 | 22.0                          | 8.0                      | 0.5                               |
| #220.0   | X         | T496X227(1)010A(2) E300 | 22.0                          | 8.0                      | 0.3                               |
| #220.0   | D         | T496D227(1)010A(2) E300 | 22.0                          | 8.0                      | 0.3                               |
| <b>16 Volt Rating at +85°C (10 Volt Rating at +125°C)</b>      |           |                         |                               |                          |                                   |
| 2.2  | B         | T496B225(1)016A(2) E3K5 | 0.5                           | 6.0                      | 3.5                               |
| 3.3  | B         | T496B335(1)016A(2) E3K5 | 0.5                           | 6.0                      | 3.5                               |
| 3.3  | B         | T496B335(1)016A(2) E2K1 | 0.5                           | 6.0                      | 2.1                               |
| 4.7  | B         | T496B475(1)016A(2) E3K5 | 0.8                           | 6.0                      | 3.5                               |
| 4.7  | B         | T496B475(1)016A(2) E1K6 | 0.8                           | 6.0                      | 1.6                               |
| 6.8  | C         | T496C685(1)016A(2) E2K0 | 1.1                           | 6.0                      | 2.0                               |
| 6.8  | C         | T496C685(1)016A(2) E600 | 1.1                           | 6.0                      | 0.6                               |
| 10.0   | B         | T496B106(1)016A(2) E3K5 | 1.6                           | 6.0                      | 3.5                               |
| 10.0   | C         | T496C106(1)016A(2) E2K0 | 1.6                           | 6.0                      | 2.0                               |
| 10.0   | C         | T496C106(1)016A(2) E700 | 1.6                           | 6.0                      | 0.7                               |
| 15.0   | C         | T496C156(1)016A(2) E2K0 | 2.4                           | 6.0                      | 2.0                               |
| 15.0   | C         | T496C156(1)016A(2) E600 | 2.4                           | 6.0                      | 0.6                               |
| 22.0   | D         | T496D226(1)016A(2) E1K0 | 3.6                           | 6.0                      | 1.0                               |
| 22.0   | D         | T496D226(1)016A(2) E500 | 3.6                           | 6.0                      | 0.5                               |
| 22.0   | C         | T496C226(1)016A(2) E1K6 | 3.6                           | 6.0                      | 1.6                               |
| 22.0   | C         | T496C226(1)016A(2) E1K0 | 3.6                           | 6.0                      | 1.0                               |
| 33.0   | D         | T496D336(1)016A(2) E1K0 | 5.3                           | 6.0                      | 1.0                               |
| 33.0   | D         | T496D336(1)016A(2) E400 | 5.3                           | 6.0                      | 0.4                               |
| 47.0   | X         | T496X476(1)016A(2) E900 | 7.5                           | 6.0                      | 0.9                               |
| 47.0   | X         | T496X476(1)016A(2) E400 | 7.5                           | 6.0                      | 0.4                               |
| 47.0   | D         | T496D476(1)016A(2) E800 | 7.5                           | 6.0                      | 0.8                               |
| 47.0   | D         | T496D476(1)016A(2) E400 | 7.5                           | 6.0                      | 0.4                               |
| 100.0  | X         | T496X107(1)016A(2) E700 | 16.0                          | 8.0                      | 0.7                               |

(1) To complete KEMET Part Number, insert M for  $\pm 20\%$  tolerance or K for  $\pm 10\%$  tolerance.

(2) To complete KEMET Part Number, insert lead material designation for Ordering Information on page 36.

Higher voltage ratings and tighter capacitance tolerance product may be substituted within the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage rating.

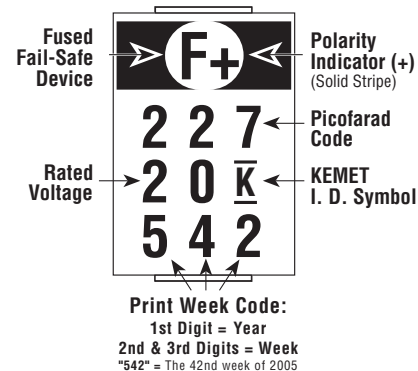
### T496 SERIES CONSTRUCTION



10 Volt Rating at +85°C (7 Volt Rating at +125°C)

### CAPACITOR MARKINGS

T496 Series — All Case Sizes



### T496 RATINGS & PART NUMBER REFERENCE

| Capacitance $\mu\text{F}$                                 | Case Size | KEMET Part Number       | DCL $\mu\text{A}$ @ 25°C Max. | DF% @ +25°C 120 Hz. Max. | ESR $\Omega$ @ +25°C 100 kHz Max. |
|---|-----------|-------------------------|-------------------------------|--------------------------|-----------------------------------|
| <b>20 Volt Rating at +85°C (13 Volt Rating at +125°C)</b> |           |                         |                               |                          |                                   |
| 1.5   | B         | T496B155(1)020A(2) E5K0 | 0.5                           | 6.0                      | 5.0                               |
| 2.2   | B         | T496B225(1)020A(2) E3K5 | 0.5                           | 6.0                      | 3.5                               |
| 2.2   | B         | T496B225(1)020A(2) E1K6 | 0.5                           | 6.0                      | 1.6                               |
| 3.3   | B         | T496B335(1)020A(2) E3K5 | 0.7                           | 6.0                      | 3.5                               |
| 4.7   | C         | T496C475(1)020A(2) E2K0 | 1.0                           | 6.0                      | 2.0                               |
| 6.8   | C         | T496C685(1)020A(2) E2K0 | 1.4                           | 6.0                      | 2.0                               |
| 6.8   | C         | T496C685(1)020A(2) E600 | 1.4                           | 6.0                      | 0.6                               |
| 10.0  | C         | T496C106(1)020A(2) E2K0 | 2.0                           | 6.0                      | 2.0                               |
| 10.0  | C         | T496C106(1)020A(2) E800 | 2.0                           | 6.0                      | 0.8                               |
| 15.0  | D         | T496D156(1)020A(2) E1K0 | 3.0                           | 6.0                      | 1.0                               |
| 15.0  | D         | T496D156(1)020A(2) E500 | 3.0                           | 6.0                      | 0.5                               |
| 15.0  | C         | T496C156(1)020A(2) E500 | 3.0                           | 6.0                      | 0.5                               |
| 22.0  | D         | T496D226(1)020A(2) E1K0 | 4.4                           | 6.0                      | 1.0                               |
| 22.0  | D         | T496D226(1)020A(2) E500 | 4.4                           | 6.0                      | 0.5                               |
| 33.0  | X         | T496X335(1)020A(2) E900 | 6.6                           | 6.0                      | 0.9                               |
| 33.0  | X         | T496X335(1)020A(2) E400 | 6.6                           | 6.0                      | 0.4                               |
| 33.0  | D         | T496D335(1)020A(2) E400 | 6.6                           | 6.0                      | 0.4                               |
| 47.0  | X         | T496X475(1)020A(2) E300 | 9.4                           | 6.0                      | 0.3                               |
| 47.0  | D         | T496D475(1)020A(2) E300 | 9.4                           | 6.0                      | 0.3                               |
| <b>25 Volt Rating at +85°C (17 Volt Rating at +125°C)</b> |           |                         |                               |                          |                                   |
| 0.68  | B         | T496B684(1)025A(2) E6K5 | 0.5                           | 4.0                      | 6.5                               |
| 1.0   | B         | T496B105(1)025A(2) E5K0 | 0.5                           | 4.0                      | 5.0                               |
| 1.0   | B         | T496B105(1)025A(2) E3K5 | 0.5                           | 4.0                      | 3.5                               |
| 1.5   | B         | T496B155(1)025A(2) E5K0 | 0.5                           | 6.0                      | 5.0                               |
| 1.5   | B         | T496B155(1)025A(2) E1K6 | 0.5                           | 6.0                      | 1.6                               |
| 2.2   | C         | T496C225(1)025A(2) E3K5 | 0.6                           | 6.0                      | 3.5                               |
| 3.3   | C         | T496C335(1)025A(2) E2K5 | 0.9                           | 6.0                      | 2.5                               |
| 3.3   | C         | T496C335(1)025A(2) E2K1 | 0.9                           | 6.0                      | 2.1                               |
| 4.7   | B         | T496B475(1)025A(2) E4K0 | 1.2                           | 6.0                      | 4.0                               |
| 4.7   | C         | T496C475(1)025A(2) E2K5 | 1.2                           | 6.0                      | 2.5                               |
| 4.7   | C         | T496C475(1)025A(2) E1K3 | 1.2                           | 6.0                      | 1.3                               |
| 6.8   | C         | T496C685(1)025A(2) E2K0 | 1.7                           | 6.0                      | 2.0                               |
| 6.8   | C         | T496C685(1)025A(2) E600 | 1.7                           | 6.0                      | 0.6                               |
| 10.0  | C         | T496C106(1)025A(2) E600 | 2.5                           | 6.0                      | 0.6                               |
| 10.0  | D         | T496D106(1)025A(2) E1K2 | 2.5                           | 6.0                      | 1.2                               |
| 10.0  | D         | T496D106(1)025A(2) E600 | 2.5                           | 6.0                      | 0.6                               |
| 15.0  | C         | T496C156(1)025A(2) E750 | 3.8                           | 6.0                      | 0.8                               |
| 15.0  | D         | T496D156(1)025A(2) E1K0 | 3.8                           | 6.0                      | 1.0                               |
| 15.0  | D         | T496D156(1)025A(2) E500 | 3.8                           | 6.0                      | 0.5                               |
| 22.0  | X         | T496X226(1)025A(2) E900 | 5.5                           | 6.0                      | 0.9                               |
| 22.0  | X         | T496X226(1)025A(2) E400 | 5.5                           | 6.0                      | 0.4                               |
| 22.0  | D         | T496D226(1)025A(2) E800 | 5.5                           | 6.0                      | 0.8                               |
| 22.0  | D         | T496D226(1)025A(2) E400 | 5.5                           | 6.0                      | 0.4                               |

| Capacitance $\mu\text{F}$                                 | Case Size | KEMET Part Number       | DCL $\mu\text{A}$ @ 25°C Max. | DF% @ +25°C 120 Hz. Max. | ESR $\Omega$ @ +25°C 100 kHz Max. |
|---|-----------|-------------------------|-------------------------------|--------------------------|-----------------------------------|
| <b>35 Volt Rating at +85°C (23 Volt Rating at +125°C)</b> |           |                         |                               |                          |                                   |
| 0.47  | B         | T496B474(1)035A(2) E8K0 | 0.5                           | 4.0                      | 8.0                               |
| 0.47  | B         | T496B474(1)035A(2) E2K6 | 0.5                           | 4.0                      | 2.6                               |
| 0.68  | B         | T496B684(1)035A(2) E6K5 | 0.5                           | 4.0                      | 6.5                               |
| 1.0   | B         | T496B105(1)035A(2) E5K0 | 0.5                           | 4.0                      | 5.0                               |
| 1.0   | B         | T496B105(1)035A(2) E3K1 | 0.5                           | 4.0                      | 3.1                               |
| 1.5   | C         | T496C155(1)035A(2) E4K5 | 0.5                           | 6.0                      | 4.5                               |
| 1.5   | C         | T496C155(1)035A(2) E2K6 | 0.5                           | 6.0                      | 2.6                               |
| 2.2   | C         | T496C225(1)035A(2) E3K5 | 0.8                           | 6.0                      | 3.5                               |
| 2.2   | C         | T496C225(1)035A(2) E1K6 | 0.8                           | 6.0                      | 1.6                               |
| 3.3   | C         | T496C335(1)035A(2) E2K5 | 1.2                           | 6.0                      | 2.5                               |
| 3.3   | C         | T496C335(1)035A(2) E900 | 1.2                           | 6.0                      | 0.9                               |
| 4.7   | D         | T496D475(1)035A(2) E1K5 | 1.7                           | 6.0                      | 1.5                               |
| 4.7   | D         | T496D475(1)035A(2) E700 | 1.7                           | 6.0                      | 0.7                               |
| 6.8   | D         | T496D685(1)035A(2) E1K3 | 2.4                           | 6.0                      | 1.3                               |
| 6.8   | D         | T496D685(1)035A(2) E750 | 2.4                           | 6.0                      | 0.75                              |
| 10.0  | X         | T496X106(1)035A(2) E1K0 | 3.5                           | 6.0                      | 1.0                               |
| 10.0  | X         | T496X106(1)035A(2) E500 | 3.5                           | 6.0                      | 0.5                               |
| 10.0  | D         | T496D106(1)035A(2) E400 | 3.5                           | 6.0                      | 0.5                               |
| 15.0  | X         | T496X156(1)035A(2) E900 | 5.3                           | 6.0                      | 0.9                               |
| 15.0  | X         | T496X156(1)035A(2) E500 | 5.3                           | 6.0                      | 0.5                               |
| 15.0  | D         | T496D156(1)035A(2) E500 | 5.3                           | 6.0                      | 0.5                               |
| 22.0  | X         | T496X226(1)035A(2) E300 | 7.7                           | 6.0                      | 0.3                               |
| <b>50 Volt Rating at +85°C (33 Volt Rating at +125°C)</b> |           |                         |                               |                          |                                   |
| 0.15  | B         | T496B154(1)050A(2) E16K | 0.5                           | 4.0                      | 16.0                              |
| 0.22  | B         | T496B224(1)050A(2) E14K | 0.5                           | 4.0                      | 14.0                              |
| 0.22  | B         | T496B224(1)050A(2) E10K | 0.5                           | 4.0                      | 10.0                              |
| 0.33  | B         | T496B334(1)050A(2) E10K | 0.5                           | 4.0                      | 10.0                              |
| 0.33  | B         | T496B334(1)050A(2) E2K6 | 0.5                           | 4.0                      | 2.6                               |
| 0.47  | C         | T496C474(1)050A(2) E8K0 | 0.5                           | 4.0                      | 8.0                               |
| 0.47  | C         | T496C474(1)050A(2) E1K9 | 0.5                           | 4.0                      | 1.9                               |
| 0.68  | C         | T496C684(1)050A(2) E7K0 | 0.5                           | 4.0                      | 7.0                               |
| 0.68  | C         | T496C684(1)050A(2) E1K7 | 0.5                           | 4.0                      | 1.7                               |
| 1.0   | C         | T496C105(1)050A(2) E5K5 | 0.5                           | 4.0                      | 5.5                               |
| 1.0   | C         | T496C105(1)050A(2) E2K7 | 0.5                           | 4.0                      | 2.7                               |
| 1.5   | C         | T496C155(1)050A(2) E5K0 | 0.8                           | 6.0                      | 5.0                               |
| 1.5   | C         | T496C155(1)050A(2) E2K0 | 0.8                           | 6.0                      | 2.0                               |
| 2.2   | D         | T496D225(1)050A(2) E2K5 | 1.1                           | 6.0                      | 2.5                               |
| 2.2   | D         | T496D225(1)050A(2) E900 | 1.1                           | 6.0                      | 0.9                               |
| 3.3   | D         | T496D335(1)050A(2) E2K0 | 1.7                           | 6.0                      | 2.0                               |
| 3.3   | D         | T496D335(1)050A(2) E1K0 | 1.7                           | 6.0                      | 1.0                               |
| 4.7   | X         | T496X475(1)050A(2) E1K5 | 2.4                           | 6.0                      | 1.5                               |
| 4.7   | X         | T496X475(1)050A(2) E400 | 2.4                           | 6.0                      | 0.4                               |
| 4.7   | D         | T496D475(1)050A(2) E400 | 2.4                           | 6.0                      | 0.4                               |

(1) To complete KEMET Part Number, insert M for  $\pm 20\%$  tolerance or K for  $\pm 10\%$  tolerance.

(2) To complete KEMET Part Number, insert lead material designation for Ordering Information on page 36.

**Higher voltage ratings and tighter capacitance tolerance product may be substituted within the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage rating.**

# SOLID TANTALUM CHIP CAPACITORS

## T498 SERIES—HIGH TEMPERATURE (150°C)

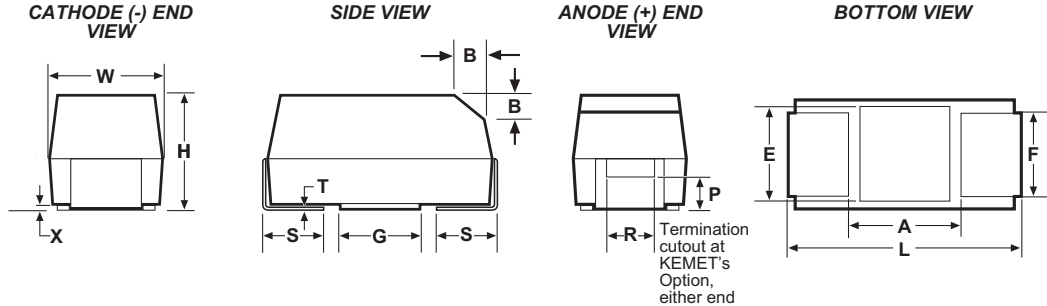


Solid Tantalum Surface Mount

### Features

- 150°C Maximum temperature capability
- Temperature/Voltage derating: 2/3 at 150°C
- Self-healing mechanism
- Capacitance: 0.47 to 220µF
- Reliability: 0.5%/1000 Hrs. @ rated voltage @ rated temperature
- 100% Accelerated steady state aging
- 100% Surge current testing
- EIA standard case size
- Voltage: 6 to 50 VDC
- RoHS Compliant versions available
- Various termination options

### Outline Drawings



### Dimensions - Millimeters (Inches)

| Case Size |         | Component                  |                            |                            |                        |                         |                               |                              |               |               |                |               |               |               |
|-----------|---------|----------------------------|----------------------------|----------------------------|------------------------|-------------------------|-------------------------------|------------------------------|---------------|---------------|----------------|---------------|---------------|---------------|
| KEMET     | EIA     | L*                         | W*                         | H*                         | F*<br>±0.1<br>± (.004) | S*<br>± 0.3<br>± (.012) | B (Ref)<br>± 0.15<br>± (.004) | X<br>(Ref)                   | P<br>(Ref)    | R<br>(Ref)    | T<br>(Ref)     | A<br>(Min)    | G<br>(Ref)    | E<br>(Ref)    |
| A         | 3216-18 | 3.2 ± 0.2<br>(.126 ± .008) | 1.6 ± 0.2<br>(.063 ± .008) | 1.6 ± 0.2<br>(.063 ± .008) | 1.2<br>(.047)          | 0.8<br>(.031)           | 0.4<br>(.016)                 | 0.10 ± 0.10<br>(.004 ± .004) | 0.4<br>(.016) | 0.4<br>(.016) | 0.13<br>(.005) | 0.8<br>(.031) | 1.1<br>(.043) | 1.3<br>(.051) |
| B         | 3528-21 | 3.5 ± 0.2<br>(.138 ± .008) | 2.8 ± 0.2<br>(.110 ± .008) | 1.9 ± 0.2<br>(.075 ± .008) | 2.2<br>(.087)          | 0.8<br>(.031)           | 0.4<br>(.016)                 | 0.10 ± 0.10<br>(.004 ± .004) | 0.5<br>(.020) | 1.0<br>(.039) | 0.13<br>(.005) | 1.1<br>(.043) | 1.8<br>(.071) | 2.2<br>(.087) |
| C         | 6032-28 | 6.0 ± 0.3<br>(.236 ± .012) | 3.2 ± 0.3<br>(.126 ± .012) | 2.5 ± 0.3<br>(.098 ± .012) | 2.2<br>(.087)          | 1.3<br>(.051)           | 0.5<br>(.020)                 | 0.10 ± 0.10<br>(.004 ± .004) | 0.9<br>(.035) | 1.0<br>(.039) | 0.13<br>(.005) | 2.5<br>(.098) | 2.8<br>(.110) | 2.4<br>(.094) |
| D         | 7343-31 | 7.3 ± 0.3<br>(.287 ± .012) | 4.3 ± 0.3<br>(.169 ± .012) | 2.8 ± 0.3<br>(.110 ± .012) | 2.4<br>(.094)          | 1.3<br>(.051)           | 0.5<br>(.020)                 | 0.10 ± 0.10<br>(.004 ± .004) | 0.9<br>(.035) | 1.0<br>(.039) | 0.13<br>(.005) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |
| X         | 7343-43 | 7.3 ± 0.3<br>(.287 ± .012) | 4.3 ± 0.3<br>(.169 ± .012) | 4.0 ± 0.3<br>(.157 ± .012) | 2.4<br>(.094)          | 1.3<br>(.051)           | 0.5<br>(.020)                 | 0.10 ± 0.10<br>(.004 ± .004) | 1.7<br>(.067) | 1.0<br>(.039) | 0.13<br>(.005) | 3.8<br>(.150) | 3.5<br>(.138) | 3.5<br>(.138) |

Notes: 1. Metric dimensions govern  
2. (Ref) Dimensions provided for reference

### T498 Ordering Information

**T 498 X 227 M 010 A T E500**

**Tantalum** ————

**Series** ————  
498 – High Temp (150°C)

**Case Size** ————  
A,B,C,D,X

**Capacitance Picofarad Code** ————  
First two digits represent significant figures.  
Third digit specifies number of zeros.

**Capacitance Tolerance** ————  
M = ±20%  
K = ±10%

**ESR** ————  
Note: in mOhm  
K designates "thousand"  
E1K5 = 1.5 Ohm  
E500 = 0.5 Ohm

**Lead Material** ————  
T = 100% Tin  
G = Gold

**Failure Rate** ————  
A = Not Applicable

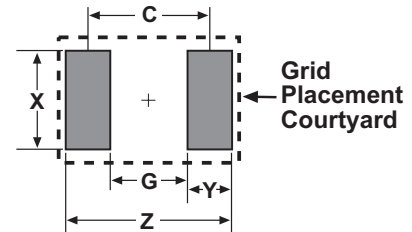
**Voltage** ————  
Note: 006 = 6.3

**T498 RATINGS & PART NUMBER REFERENCE**

| Capacitance<br>µF  | Case Size | KEMET Part Number      | DC Leakage<br>µA @<br>25°C Max | DF %<br>@ +25°C<br>120 Hz<br>Max | ESR Ω<br>@ +25°C<br>100 kHz<br>Max |
|--|-----------|------------------------|--------------------------------|----------------------------------|------------------------------------|
| <b>**6.3 Volt Rating at +85°C ( 4 Volt Rating at +150°C)</b> |           |                        |                                |                                  |                                    |
| 10.0   | B         | T498B106(1)006A(2)E2K1 | 0.7                            | 6.0                              | 2.1                                |
| 15.0   | B         | T498B156(1)006A(2)E1K8 | 1.0                            | 6.0                              | 1.8                                |
| 22.0   | C         | T498C226(1)006A(2)E1K3 | 1.4                            | 6.0                              | 1.3                                |
| 33.0   | B         | T498B336(1)006A(2)E1K7 | 2.1                            | 6.0                              | 1.7                                |
| 47.0   | C         | T498C476(1)006A(2)E800 | 3.0                            | 6.0                              | 0.8                                |
| 100.0  | D         | T498D107(1)006A(2)E600 | 6.3                            | 8.0                              | 0.6                                |
| <b>10 Volt Rating at +85°C ( 7 Volt Rating at +150°C)</b>    |           |                        |                                |                                  |                                    |
| 2.2  | A         | T498A225(1)010A(2)E4K6 | 0.5                            | 6.0                              | 4.6                                |
| 3.3  | A         | T498A335(1)010A(2)E3K6 | 0.5                            | 6.0                              | 3.6                                |
| 4.7  | A         | T498A475(1)010A(2)E2K9 | 0.5                            | 6.0                              | 2.9                                |
| 4.7  | B         | T498B475(1)010A(2)E2K7 | 0.5                            | 6.0                              | 2.7                                |
| 10.0   | B         | T498B106(1)010A(2)E1K8 | 1.0                            | 6.0                              | 1.8                                |
| 15.0   | B         | T498B156(1)010A(2)E1K5 | 1.5                            | 6.0                              | 1.5                                |
| 15.0   | C         | T498C156(1)010A(2)E1K8 | 1.5                            | 6.0                              | 1.8                                |
| 22.0   | B         | T498B226(1)010A(2)E1K5 | 2.2                            | 6.0                              | 1.5                                |
| 22.0   | C         | T498C226(1)010A(2)E1K1 | 2.2                            | 6.0                              | 1.1                                |
| 47.0   | D         | T498D476(1)010A(2)E600 | 4.7                            | 6.0                              | 0.6                                |
| 100.0  | D         | T498D107(1)010A(2)E600 | 10.0                           | 8.0                              | 0.6                                |
| 220.0  | X         | T498X227(1)010A(2)E500 | 22.0                           | 8.0                              | 0.5                                |
| <b>16 Volt Rating at +85°C (11 Volt Rating at +150°C)</b>    |           |                        |                                |                                  |                                    |
| 1.0  | A         | T498A105(1)016A(2)E6K5 | 0.5                            | 4.0                              | 6.5                                |
| 3.3  | A         | T498A335(1)016A(2)E3K4 | 0.5                            | 6.0                              | 3.4                                |
| 4.7  | B         | T498B475(1)016A(2)E2K1 | 0.8                            | 6.0                              | 2.1                                |
| 6.8  | A         | T498A685(1)016A(2)E2K6 | 1.1                            | 6.0                              | 2.6                                |
| 6.8  | B         | T498B685(1)016A(2)E1K8 | 1.1                            | 6.0                              | 1.8                                |
| 10.0   | B         | T498B106(1)016A(2)E2K8 | 1.6                            | 6.0                              | 2.8                                |
| 10.0   | C         | T498C106(1)016A(2)E1K4 | 1.6                            | 6.0                              | 1.4                                |
| 15.0   | C         | T498C156(1)016A(2)E1K1 | 2.4                            | 6.0                              | 1.1                                |
| 22.0   | C         | T498C226(1)016A(2)E1K0 | 3.6                            | 6.0                              | 1.0                                |
| 33.0   | D         | T498D336(1)016A(2)E600 | 5.3                            | 6.0                              | 0.6                                |
| 47.0   | D         | T498D476(1)016A(2)E600 | 7.5                            | 6.0                              | 0.6                                |
| 68.0   | D         | T498D686(1)016A(2)E600 | 10.8                           | 6.0                              | 0.6                                |
| 100.0  | X         | T498X107(1)016A(2)E100 | 16.0                           | 8.0                              | 0.1                                |
| <b>20 Volt Rating at +85°C (13 Volt Rating at +150°C)</b>    |           |                        |                                |                                  |                                    |
| 1.0  | A         | T498A105(1)020A(2)E5K9 | 0.5                            | 4.0                              | 5.9                                |
| 10.0   | C         | T498C106(1)020A(2)E1K1 | 2.0                            | 6.0                              | 1.1                                |
| <b>25 Volt Rating at +85°C (17 Volt Rating at +150°C)</b>    |           |                        |                                |                                  |                                    |
| 0.47   | A         | T498A474(1)025A(2)E8K5 | 0.5                            | 4.0                              | 8.5                                |
| 2.2  | B         | T498B225(1)025A(2)E3K0 | 0.6                            | 6.0                              | 3.0                                |
| 10.0   | C         | T498C106(1)025A(2)E1K1 | 2.5                            | 6.0                              | 1.1                                |
| 15.0   | D         | T498D156(1)025A(2)E700 | 3.8                            | 6.0                              | 0.7                                |
| 22.0   | D         | T498D226(1)025A(2)E600 | 5.5                            | 6.0                              | 0.6                                |
| 33.0   | D         | T498D336(1)025A(2)E600 | 8.3                            | 6.0                              | 0.6                                |
| <b>35 Volt Rating at +85°C (24 Volt Rating at +150°C)</b>    |           |                        |                                |                                  |                                    |
| 0.33   | A         | T498A334(1)035A(2)E11K | 0.5                            | 4.0                              | 11.0                               |
| 1.0  | A         | T498A105(1)035A(2)E10K | 0.5                            | 4.0                              | 10.0                               |
| 1.5  | C         | T498C155(1)035A(2)E3K3 | 0.5                            | 6.0                              | 3.3                                |
| 3.3  | C         | T498C335(1)035A(2)E1K7 | 1.2                            | 6.0                              | 1.7                                |
| 6.8  | D         | T498D685(1)035A(2)E900 | 2.4                            | 6.0                              | 0.9                                |
| 10.0   | D         | T498D106(1)035A(2)E700 | 3.5                            | 6.0                              | 0.7                                |
| 22.0   | X         | T498X226(1)035A(2)E500 | 7.7                            | 6.0                              | 0.5                                |
| 33.0   | X         | T498X336(1)035A(2)E500 | 11.6                           | 6.0                              | 0.5                                |
| <b>50 Volt Rating at +85°C (34 Volt Rating at +150°C)</b>    |           |                        |                                |                                  |                                    |
| 3.3  | D         | T498D335(1)050A(2)E1K1 | 1.7                            | 6.0                              | 1.1                                |
| 10.0   | D         | T498D106(1)050A(2)E1K0 | 5.0                            | 6.0                              | 1.0                                |

**LAND PATTERN DIMENSIONS FOR REFLOW SOLDER**

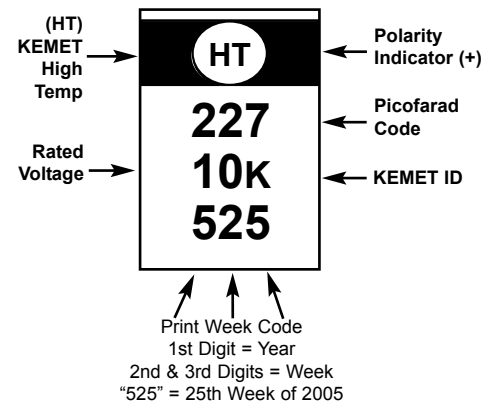
| KEMET/<br>EIA Size<br>Code | Pad Dimensions |      |      |            |            |
|----------------------------|----------------|------|------|------------|------------|
|                            | Z              | G    | X    | Y<br>(Ref) | C<br>(Ref) |
| A/3216-18                  | 4.70           | 0.80 | 1.50 | 1.95       | 2.75       |
| B/3528-21                  | 5.00           | 1.10 | 2.50 | 1.95       | 3.05       |
| C/6032-28                  | 7.60           | 2.50 | 2.50 | 2.55       | 5.05       |
| D/7343-31                  | 8.90           | 3.80 | 2.70 | 2.55       | 6.35       |
| X/7343-43                  | 8.90           | 3.80 | 4.40 | 2.55       | 6.35       |



**PACKAGING SPECIFICATIONS**

| Case Codes |         | Tape & Reel Dimensions |                   |          |               |                |
|------------|---------|------------------------|-------------------|----------|---------------|----------------|
| KEMET      | EIA     | Tape Width<br>(mm)     | Pitch<br>mm ± 0.1 |          | Reel Quantity |                |
|            |         |                        | Part              | Sprocket | 180mm<br>(7") | 330mm<br>(13") |
| A          | 3216-18 | 8 ± 0.3                | 8                 | 4        | 2000          | 9000           |
| B          | 3528-21 | 8 ± 0.3                | 8                 | 4        | 2000          | 8000           |
| C          | 6032-28 | 12 ± 0.3               | 8                 | 4        | 500           | 3000           |
| D          | 7343-31 | 12 ± 0.3               | 8                 | 4        | 500           | 2500           |
| X          | 7343-43 | 12 ± 0.3               | 8                 | 4        | 500           | 2000           |

**COMPONENT MARKING**



(1) To complete KEMET part number, insert K - ± 10% or M - ±20% capacitance tolerance.

(2) To complete KEMET part number, insert T for 100% tin, or G for gold.

\*\* 6 volt product equivalent to 6.3 volt product.

Note: Higher voltage ratings, lower ESR and tighter capacitance tolerance product may be substituted within the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage rating.

# SOLID TANTALUM CHIP CAPACITORS

## T510 SERIES—High Capacitance-Low ESR

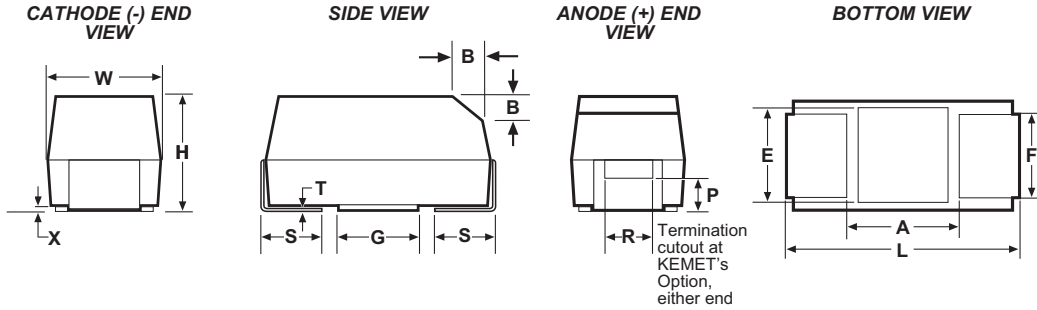


Solid Tantalum Surface Mount

### FEATURES

- Ultra Low ESR < 30 mΩ
- New E/7260 Case with ESR < 18 mΩ
- Up to 5 Amps ripple current
- RoHS Compliant & Leadfree Termination (see [www.kemet.com](http://www.kemet.com) for lead transitions)
- Operating Temperature: -55°C to +125°C
- 100% accelerated steady-state aging
- 100% Surge current test
- Precision - molded, laser-marked case
- Symmetrical compliant terminations
- Taped and reeled per EIA 481-1

### OUTLINE DRAWING



### DIMENSIONS - Millimeters (Inches)

| Case Size |         | Component               |                         |                         |                  |                  |                       |                           |            |            |             |            |            |            |
|-----------|---------|-------------------------|-------------------------|-------------------------|------------------|------------------|-----------------------|---------------------------|------------|------------|-------------|------------|------------|------------|
| KEMET     | EIA     | L                       | W                       | H                       | F ± 0.1 ± (.004) | S ± 0.3 ± (.012) | B ± 0.15 (Ref) ± .006 | X (Ref)                   | P (Ref)    | R (Ref)    | T (Ref)     | A (Min)    | G (Ref)    | E (Ref)    |
| X         | 7343-43 | 7.3 ± 0.3 (.287 ± .012) | 4.3 ± 0.3 (.169 ± .012) | 4.0 ± 0.3 (.157 ± .012) | 2.4 (.094)       | 1.3 (.051)       | 0.5 (.020)            | 0.10 ± 0.10 (.004 ± .004) | 1.7 (.067) | 1.0 (.039) | 0.13 (.005) | 3.8 (.150) | 3.5 (.138) | 3.5 (.138) |
| E         | 7260-38 | 7.3 ± 0.3 (.287 ± .012) | 6.0 ± 0.3 (.236 ± .012) | 3.6 ± 0.2 (.142 ± .008) | 4.1 (.161)       | 1.3 (.051)       | 0.5 (.020)            | 0.10 ± 0.10 (.004 ± .004) | 0.9 (.035) | 1.0 (.039) | 0.13 (.005) | 3.8 (.150) | 3.5 (.138) | 3.5 (.138) |

Notes: 1. Metric dimensions govern  
2. (Ref) Dimensions provided for reference only.

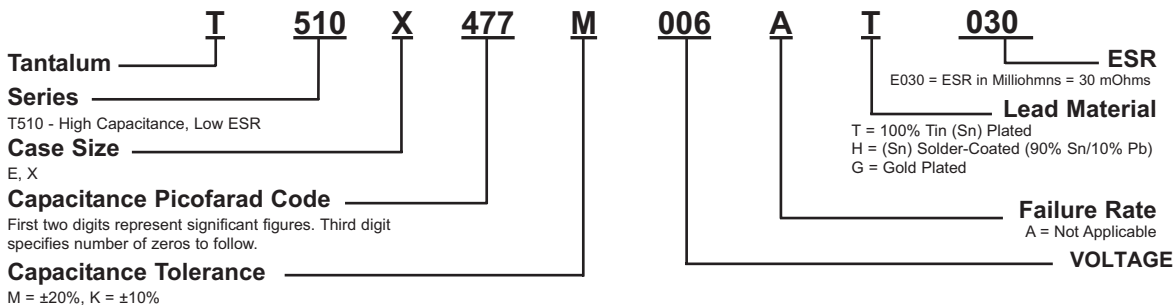
### T510 RATINGS & PART NUMBER REFERENCE

| Cap μF   | Case Size | KEMET Part Number      | DC Leakage μA @ +25°C Max | DF % @ +25°C 120Hz Max | ESR mΩ @ +25°C 100 kHz Max | Ripple Current Arms @ +25°C, 100 kHz, max |      |       |
|--|-----------|------------------------|---------------------------|------------------------|----------------------------|---|------|-------|
|  |           |                        |                           |                        |                            | 25°C                                      | 85°C | 125°C |
| <b>4 Volt Rating at +85°C (2.7 Volt Rating at 125°C)</b>   |           |                        |                           |                        |                            |   |      |       |
| 680.0  | X         | T510X687(1)004A(2)E030 | 27.2                      | 6.0                    | 30                         | 3.0                                       | 2.7  | 1.2   |
| 1000.0   | X         | T510X108(1)004A(2)E018 | 40.0                      | 6.0                    | 18                         | 3.9                                       | 3.5  | 1.5   |
| 1000.0   | X         | T510X108(1)004A(2)E023 | 40.0                      | 6.0                    | 23                         | 3.4                                       | 3.0  | 1.3   |
| 1000.0   | E         | T510E108(1)004A(2)E018 | 40.0                      | 6.0                    | 18                         | 4.0                                       | 3.6  | 1.6   |
| 1000.0   | E         | T510E108(1)004A(2)E010 | 40.0                      | 6.0                    | 10                         | 5.3                                       | 4.8  | 2.1   |
| <b>6/6.3 Volt Rating at +85°C (4 Volt Rating at 125°C)</b> |           |                        |                           |                        |                            |   |      |       |
| 470.0  | X         | T510X477(1)006A(2)E030 | 28.2                      | 6.0                    | 30                         | 3.0                                       | 2.7  | 1.2   |
| 680.0  | X         | T510X687(1)006A(2)E023 | 42.8                      | 6.0                    | 23                         | 3.4                                       | 3.1  | 1.4   |
| 680.0  | E         | T510E687(1)006A(2)E023 | 40.8                      | 6.0                    | 23                         | 3.5                                       | 3.2  | 1.4   |
| 680.0  | E         | T510E687(1)006A(2)E012 | 40.8                      | 6.0                    | 12                         | 4.8                                       | 4.3  | 1.9   |
| <b>10 Volt Rating at +85°C (7 Volt Rating at 125°C)</b>    |           |                        |                           |                        |                            |   |      |       |
| 330.0  | X         | T510X337(1)010A(2)E035 | 33.0                      | 6.0                    | 35                         | 2.8                                       | 2.5  | 1.1   |
| <b>16 Volt Rating at +85°C (11 Volt Rating at 125°C)</b>   |           |                        |                           |                        |                            |   |      |       |
| 150.0  | X         | T510X157(1)016A(2)E030 | 24.0                      | 6.0                    | 30                         | 3.0                                       | 2.7  | 1.2   |
| 150.0  | X         | T510X157(1)016A(2)E040 | 24.0                      | 6.0                    | 40                         | 2.6                                       | 2.3  | 1.0   |
| 220.0  | X         | T510X227(1)016A(2)E040 | 35.2                      | 10.0                   | 40                         | 2.6                                       | 2.3  | 1.0   |
| 220.0  | X         | T510X227(1)016A(2)E025 | 35.2                      | 10.0                   | 25                         | 3.3                                       | 3.0  | 1.3   |

| Cap μF   | Case Size | KEMET Part Number      | DC Leakage μA @ +25°C Max | DF % @ +25°C 120Hz Max | ESR mΩ @ +25°C 100 kHz Max | Ripple Current Arms @ +25°C, 100 kHz, max |      |       |
|--|-----------|------------------------|---------------------------|------------------------|----------------------------|---|------|-------|
|  |           |                        |                           |                        |                            | 25°C                                      | 85°C | 125°C |
| <b>20 Volt Rating at +85°C (13.4 Volt Rating at 125°C)</b> |           |                        |                           |                        |                            |   |      |       |
| 100.0  | X         | T510X107(1)020A(2)E035 | 20.0                      | 8.0                    | 35.0                       | 2.8                                       | 2.5  | 1.1   |
| 100.0  | X         | T510X107(1)020A(2)E040 | 20.0                      | 6.0                    | 40.0                       | 2.6                                       | 2.3  | 1.0   |
| 100.0  | X         | T510X107(1)020A(2)E045 | 20.0                      | 6.0                    | 45.0                       | 2.4                                       | 2.2  | 0.9   |
| <b>25 Volt Rating at +85°C (17 Volt Rating at 125°C)</b>   |           |                        |                           |                        |                            |   |      |       |
| 68.0   | X         | T510X686(1)025A(2)E045 | 17.0                      | 8.0                    | 45                         | 2.4                                       | 2.1  | 1.0   |
| 100.0  | E         | T510E107(1)025A(2)E050 | 25.0                      | 8.0                    | 50                         | 2.4                                       | 2.1  | 1.0   |
| <b>35 Volt Rating at +85°C (23 Volt Rating at 125°C)</b>   |           |                        |                           |                        |                            |   |      |       |
| 22.0   | X         | T510X226(1)035A(2)E100 | 7.7                       | 6.0                    | 100                        | 1.6                                       | 1.4  | 0.6   |
| 22.0   | X         | T510X226(1)035A(2)E080 | 7.7                       | 6.0                    | 80                         | 1.8                                       | 1.7  | 0.7   |
| 22.0   | X         | T510X226(1)035A(2)E060 | 7.7                       | 6.0                    | 60                         | 2.1                                       | 1.9  | 0.8   |
| 33.0   | X         | T510X336(1)035A(2)E065 | 11.6                      | 6.0                    | 65                         | 2.0                                       | 1.8  | 0.8   |
| 33.0   | X         | T510X336(1)035A(2)E050 | 11.6                      | 6.0                    | 50                         | 2.3                                       | 2.1  | 0.9   |
| 47.0   | X         | T510X476(1)035A(2)E055 | 16.5                      | 8.0                    | 55                         | 2.2                                       | 2.0  | 0.9   |
| 47.0   | X         | T510X476(1)035A(2)E065 | 16.5                      | 8.0                    | 65                         | 2.0                                       | 1.8  | 0.8   |
| 47.0   | E         | T510E476(1)035A(2)E050 | 16.5                      | 8.0                    | 50                         | 2.4                                       | 2.1  | 1.0   |
| <b>50 Volt Rating at +85°C (33 Volt Rating at 125°C)</b>   |           |                        |                           |                        |                            |   |      |       |
| 10.0   | X         | T510X106(1)050A(2)E120 | 5.0                       | 8.0                    | 120                        | 1.5                                       | 1.3  | 0.6   |
| 10.0   | X         | T510X106(1)050A(2)E090 | 5.0                       | 8.0                    | 90                         | 1.7                                       | 1.6  | 0.7   |

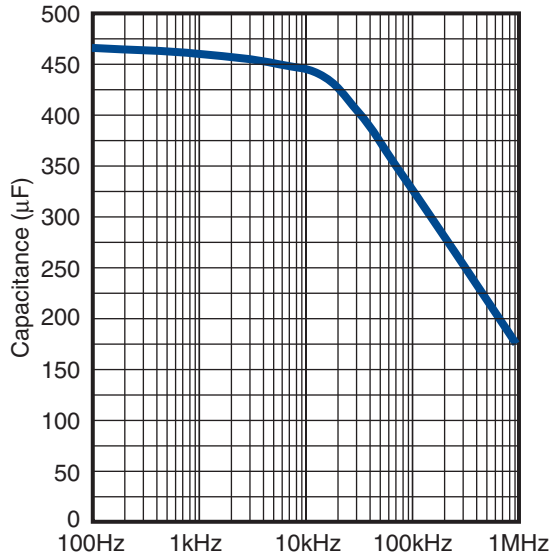
- (1) To complete KEMET part number insert  
"K" - ±10% or "M" - ±20% capacitance tolerance.  
(2) To complete KEMET part number, insert H (SnPb)  
or T - 100% tin.

### T510 ORDERING INFORMATION

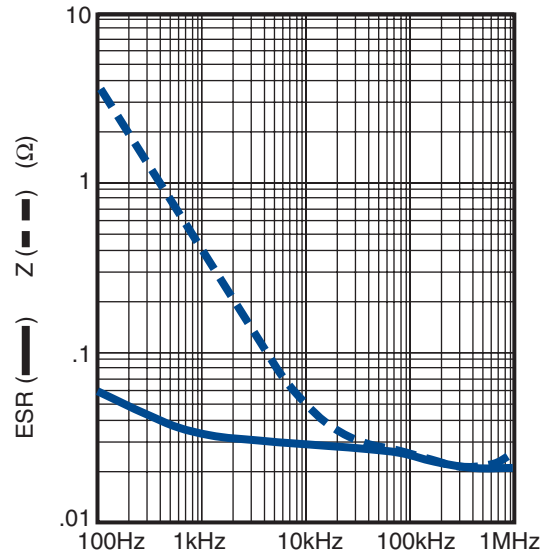




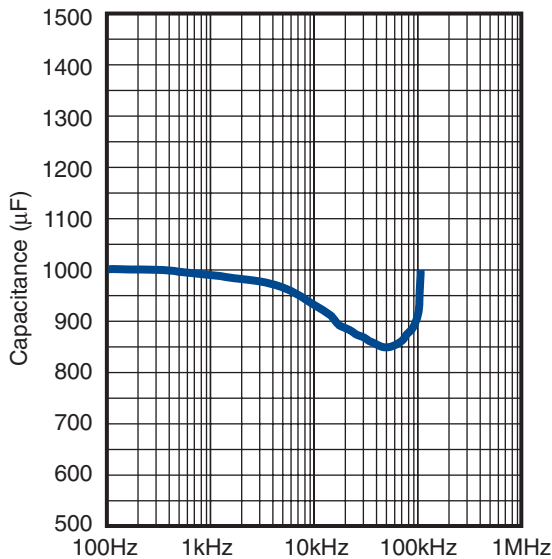
**TYPICAL CAP FREQUENCY SCAN @ 25°C**  
T510X477M006AS



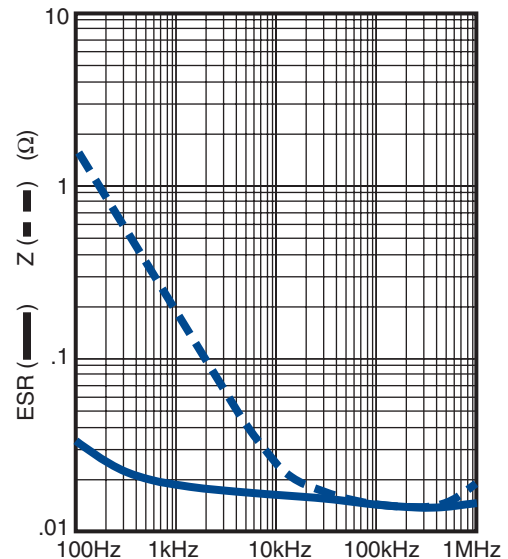
**TYPICAL ESR/Z FREQUENCY SCAN @ 25°C**  
T510X477M006AS



**TYPICAL CAP FREQUENCY SCAN @ 25°C**  
T510E108M004AS



**TYPICAL ESR/Z FREQUENCY SCAN @ 25°C**  
T510E108M004AS

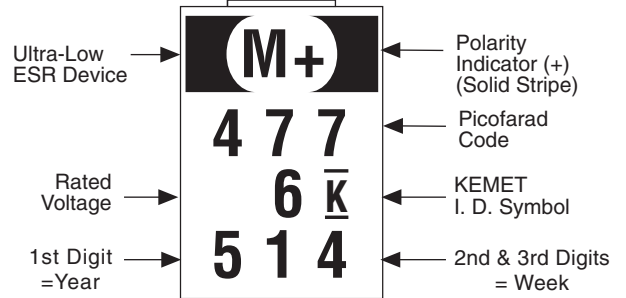
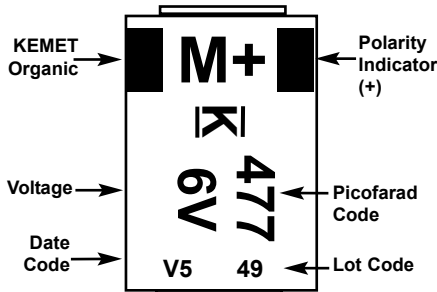


**CAPACITOR ALTERNATE MARKINGS**

**T510 CAPACITOR MARKINGS**

| Date Code Year | Date Code Month |          |
|----------------|-----------------|----------|
| S = 2004       | 1 = Jan         | 7 = Jul  |
| T = 2005       | 2 = Feb         | 8 = Aug  |
| U = 2006       | 3 = Mar         | 9 = Sep  |
| V = 2007       | 4 = Apr         | 10 = Oct |
| W = 2008       | 5 = May         | 11 = Nov |
| X = 2009       | 6 = Jun         | 12 = Dec |

| Date Code Year | Date Code Month |          |
|----------------|-----------------|----------|
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| X = 2009       | 6 = Jun         | 12 = Dec |



"514" = The 14th week of 2005.

## COMPONENT PERFORMANCE CHARACTERISTICS

### Introduction

KEMET has developed a new type of tantalum capacitor that replaces the solid manganese dioxide electrode with a solid conductive polymer. This product is named the KO-CAP for **KEMET Organic Capacitor**. The basic families are the T520, T525 and T530 series. A separate detail of performance characteristics is presented here as there are some differences between the polymer tantalums and the standard MnO<sub>2</sub> types. Like all KEMET tantalum chips, these series are 100% screened for all electrical parameters: Capacitance @ 120 Hz, Dissipation Factor (DF) @ 120 Hz, ESR @ 100 kHz and DC Leakage. It is also 100% surge current tested at full rated voltage through a low impedance circuit. The advantages of the polymer include very low ESR and elimination of the potentially catastrophic failure mode that may occur with standard tantalum capacitors in a high current application. Although the natural KO-CAP series failure mechanism is a short circuit, it does not exhibit an explosive failure mode.

## ELECTRICAL

### 1. Operating Temperature Range

- **-55°C to +105°C for T520; -55°C to +125°C for T525 and T530**

For T525 and T530 Series above 105°C, the voltage rating is reduced linearly from 1.0 x rated voltage to 0.8 x rated voltage at 125°C.

### 2. Non-Operating Temperature Range

- **-55°C to +105°C for T520**
- **-55°C to +125°C for T525 and T530**

### 3. Capacitance and Tolerance

- **15µF to 1500µF**
- **±20% Tolerance**

Capacitance is measured at 120 Hz, up to 1.0 volt rms maximum and up to 2.5V DC maximum. DC bias causes only a small reduction in capacitance, up to about 2% when full rated voltage is applied. DC bias is not commonly used for room temperature measurements but is more commonly used when measuring at temperature extremes.

Capacitance does decrease with increasing frequency, but not nearly as much or as quickly as standard tantalums. Figure 1 compares the frequency induced cap roll-off between the KO-CAP and traditional MnO<sub>2</sub> types. Capacitance also increases with increasing temperature. See section 12 for temperature coefficients.

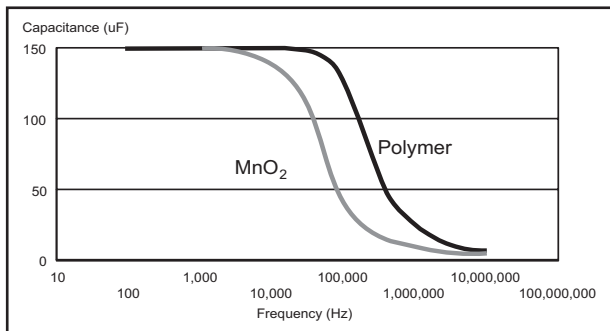
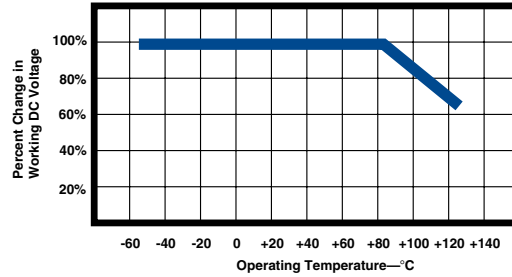


FIGURE 1

### 4. Voltage Ratings

- **2V-25V DC Rated Voltage**

This is the maximum peak DC operating voltage from -55°C to +105°C for continuous duty. Above 105°C, this voltage is derated linearly to 2/3 the rated voltage for operation at 125°C for T525 and T530 Series.



### • Surge Voltage Ratings

Surge voltage capability is demonstrated by application of 1000 cycles of the relevant voltage, at 25°C, 85°C or 105°C. The parts are charged through a 33 ohm resistor for 30 seconds and then discharged through a 33 ohm resistor for 30 seconds for each cycle.

### • Voltage Ratings • Table 1

| Rated Voltage   | Surge Voltage | Derated Voltage | Derated Surge Voltage |
|-----------------|---------------|-----------------|-----------------------|
| -55°C to +105°C |               | +125°C          |                       |
| 2V              | 2.6V          | 1.6V            | 2.1V                  |
| 2.5V            | 3.3V          | 2.0V            | 2.6V                  |
| 3V              | 3.9V          | 2.4V            | 3.1V                  |
| 4V              | 5.2V          | 3.2V            | 4.2V                  |
| 6.3V            | 8.2V          | 5V              | 6.5V                  |
| 8V              | 10.4V         | 6.4V            | 8.3V                  |
| 10V             | 13V           | 8V              | 10.4V                 |
| 16V             | 20.8V         | 12.8V           | 16.6V                 |
| 25V             | 32.5V         | 20V             | 26V                   |

### 5. Reverse Voltage Rating & Polarity

Polymer capacitors are polar devices and may be permanently damaged or destroyed if connected in the wrong polarity. The positive terminal is identified by a laser-marked stripe and may also include a beveled edge. These capacitors will withstand a small degree of transient voltage reversal for short periods as shown in the following table. Please note that these parts may not be operated continuously in reverse, even within these limits.

Table 2

| Temperature | Permissible Transient Reverse Voltage |
|-------------|---------------------------------------|
| 25°C        | 15% of Rated Voltage                  |
| 55°C        | 10% of Rated Voltage                  |
| 85°C        | 5% of Rated Voltage                   |
| 85°C        | 5% of Rated Voltage                   |
| 105°C       | 3% of Rated Voltage                   |
| 125°C       | 1% of Rated Voltage                   |

### 6. DC Leakage Current

Because of the high conductivity of the polymer, the KO-CAP family has higher leakage currents than traditional MnO<sub>2</sub> type Tantalum caps. The DC Leakage limits at 20°C are calculated as  $0.1 \times C \times V$ , where C is cap in µF and V is rated voltage in Volts. Limits for all part numbers are listed in the ratings tables.

DC Leakage current is the current that flows through the capacitor dielectric after a five minute charging period at rated voltage. Leakage is measured at 20°C with full rated voltage applied to the capacitor through a 1000 ohm resistor in series with the capacitor.

## COMPONENT PERFORMANCE CHARACTERISTICS

DC Leakage current does increase with temperature. The limits for 85°C @ Rated Voltage and 105°C @ 0.8 x Rated Voltage are both 10 times the 25°C limit.

### 7. Surge Current Capability

Certain applications may induce heavy surge currents when circuit impedance is very low (<0.1 ohm per volt). Driving inductance may also cause voltage ringing. Surge currents may appear as transients during turn-on of equipment.

The KO-CAP has a very high tolerance for surge current. And although the failure mechanism is a short circuit, they do not ignite as may occur with standard tantalums in such applications.

The KO-CAP series receives 100% screening for surge current in our production process. Capacitors are surged 4 times at full rated voltage applied through a total circuit resistance of <0.5 ohms. Failures are removed during subsequent electrical testing.

### 8. Dissipation Factor (DF)

Refer to part number tables for maximum DF limits.

Dissipation factor is measured at 120 Hz, up to 1.0 volt rms maximum, and up to 2.5 volts DC maximum at +20°C. The application of DC bias causes a small reduction in DF, about 0.2% when full rated voltage is applied. DF increases with increasing frequency.

Dissipation factor is the ratio of the equivalent series resistance (ESR) to the capacitive reactance, ( $X_c$ ) and is usually expressed as a percentage. It is directly proportional to both capacitance and frequency. Dissipation factor loses its importance at higher frequencies, (above about 1 kHz), where impedance ( $Z$ ) and equivalent series resistance (ESR) are the normal parameters of concern.

$$DF = \frac{R}{X_c} = 2 \pi f CR$$

DF= Dissipation Factor  
R= Equivalent Series Resistance (Ohms)  
 $X_c$ = Capacitive Reactance (Ohms)  
f= Frequency (Hertz)  
C= Series Capacitance (Farads)

DF is also referred to as  $\tan \delta$  or “loss tangent.” The “Quality Factor,” “Q,” is the reciprocal of DF.

### 9. Equivalent Series Resistance (ESR) and Impedance (Z)

The Equivalent Series Resistance (ESR) of the KO-CAP is much lower than standard Tantalum caps because the polymer cathode has much higher conductivity. ESR is not a pure resistance, and it decreases with increasing frequency.

Total impedance of the capacitor is the vector sum of capacitive reactance ( $X_c$ ) and ESR, below resonance; above resonance total impedance is the vector sum of inductive reactance ( $X_L$ ) and ESR.

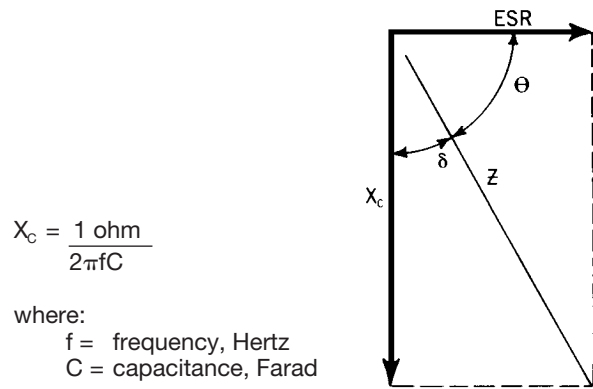


FIGURE 2a Total Impedance of the Capacitor Below Resonance

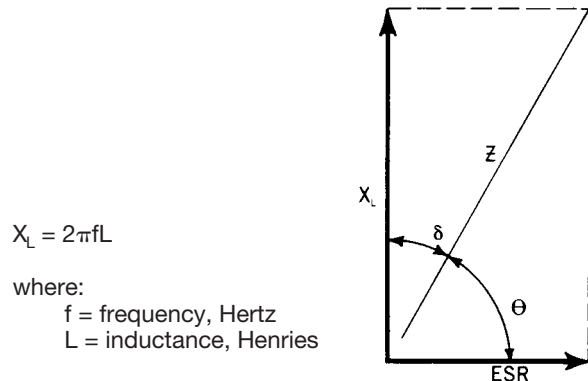
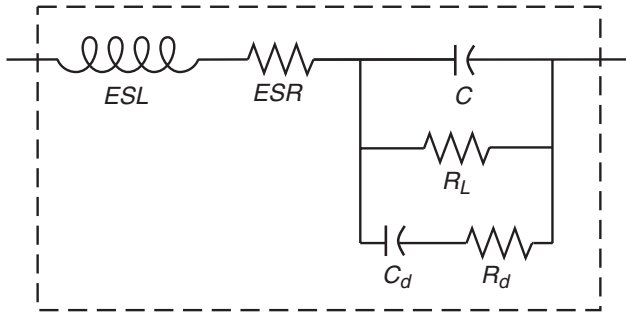


FIGURE 2b Total Impedance of the Capacitor Above Resonance

To understand the many elements of a capacitor, see Figure 3.

## COMPONENT PERFORMANCE CHARACTERISTICS



**FIGURE 3 The Real Capacitor**

A capacitor is a complex impedance consisting of many series and parallel elements, each adding to the complexity of the measurement system.

**ESL** — Represents lead wire and construction inductance. In most instances (especially in solid tantalum and monolithic ceramic capacitors) it is insignificant at the basic measurement frequencies of 120 and 1000 Hz.

**ESR**— Represents the actual ohmic series resistance in series with the capacitance. Lead wires and capacitor electrodes are contributing sources.

**$R_L$**  — Capacitor Leakage Resistance. Typically it can reach 50,000 megohms in a tantalum capacitor. It can exceed  $10^{12}$  ohms in monolithic ceramics and in film capacitors.

**$R_d$**  — The dielectric loss contributed by dielectric absorption and molecular polarization. It becomes very significant in high frequency measurements and applications. Its value varies with frequency.

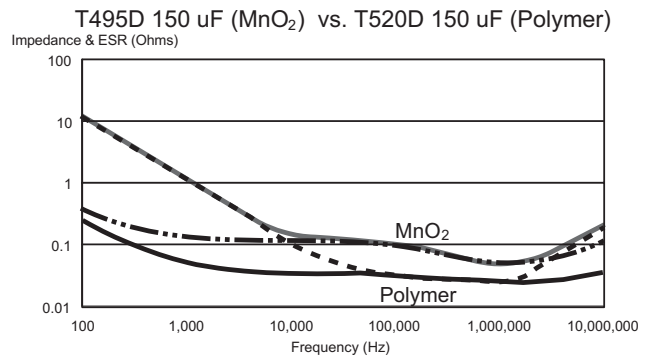
**$C_d$**  — The inherent dielectric absorption of the solid tantalum capacitor which typically equates to 1-2% of the applied voltage.

As frequency increases,  $X_C$  continues to decrease according to its equation above. There is unavoidable inductance as well as resistance in all capacitors, and at some point in frequency, the reactance ceases to be capacitive and becomes inductive. This frequency is called the self-resonant point. In solid tantalum capacitors, the resonance is damped by the ESR, and a smooth, rather than abrupt, transition from capacitive to inductive reactance follows.

Figure 4 compares the frequency response of a KO-CAP to a standard Tantalum chip. Maximum limits for 100 kHz ESR are listed in the part number tables for each series.

The T530 Capacitance, Impedance and ESR vs. Frequency Comparisons are located on page 57. Maximum limits for 100 kHz are listed in the part number table on page 56.

### ESR and Impedance



**FIGURE 4**

### 10. AC Power Dissipation

Power dissipation is a function of capacitor size and materials. Maximum power ratings have been established for all case sizes to prevent overheating. In actual use, the capacitor's ability to dissipate the heat generated at any given power level may be affected by a variety of circuit factors. These include board density, pad size, heat sinks and air circulation.

**Table 3 Power Dissipation Ratings**

| Case Code |         | Maximum Power Dissipation   |
|-----------|---------|-----------------------------|
| KEMET     | EIA     | mWatts @ +45°C w/+30°C Rise |
| T520/525T | 3528-12 | 105                         |
| T520M     | 3528-15 | 120                         |
| T520A     | 3216-18 | 112                         |
| T520/525B | 3528-21 | 127                         |
| T520U     | 6032-15 | 135                         |
| T520L     | 6032-19 | 150                         |
| T520C     | 6032-28 | 165                         |
| T520W     | 7343-15 | 180                         |
| T520V     | 7343-20 | 187                         |
| T520/525D | 7343-31 | 225                         |
| T520Y     | 7343-40 | 241                         |
| T520X     | 7343-43 | 247                         |
| T528I     | 3216-10 | 95                          |
| T528M     | 3528-15 | 200                         |
| T528Z     | 7343-17 | 325                         |
| T530D     | 7343-31 | 255                         |
| T530Y     | 7343-40 | 263                         |
| T530X     | 7343-43 | 270                         |

The maximum power dissipation rating stated in Table 3 must be reduced with increasing environmental operating temperatures. Refer to Table 3a for temperature compensation requirements.

**Table 3a Temperature Compensation Multipliers for Maximum Power Dissipation**

| ≤45°C | 45°C < T ≤ 85°C | 85°C < T ≤ 105°C |
|-------|-----------------|------------------|
| 1.00  | 0.70            | 0.25             |

\*T = Environmental Temperature

### 11. Ripple Current/ Ripple Voltage

Permissible AC ripple voltage and current are related to equivalent series resistance (ESR) and power dissipation capability. Permissible AC ripple voltage which may be applied is limited by three criteria:

- The positive peak AC voltage plus the DC bias voltage, if any, must not exceed the DC voltage rating of the capacitor.
- The negative peak AC voltage, in combination with bias voltage, if any, must not exceed the permissible reverse voltage ratings presented in Section 5.
- The power dissipated in the ESR of the capacitor must not exceed the appropriate value specified in Section 10.

## COMPONENT PERFORMANCE CHARACTERISTICS

Actual power dissipated may be calculated from the following:

$$P = I^2R$$

$$\text{Substituting } I = \frac{E}{Z}, \quad P = \frac{E^2R}{Z^2}$$

where:

I = rms ripple current (amperes)

E = rms ripple voltage (volts)

P = power (watts)

Z = impedance at specified frequency (ohms)

R = equivalent series resistance at specified frequency (ohms)

Using P max from Table 3, maximum allowable rms ripple current or voltage may be determined as follows:

$$I(\text{max}) = \sqrt{P \text{ max}/R} \quad E(\text{max}) = Z \sqrt{P \text{ max}/R}$$

## ENVIRONMENTAL

### 12. Temperature Stability

Mounted capacitors withstand extreme temperature testing at a succession of continuous steps at +25°C, -55°C, +25°C, +85°C, +105°C, +25°C in that order\*. Capacitors are allowed to stabilize at each temperature before measurement. Cap, DF, and DCL are measured at each temperature except DC Leakage is not measured at -55°C.

\*Maximum temperature 125°C for T525 and T530 series.

**Table 4**

Acceptable limits are as follows:

| Step | Temp.                            | ΔCap                  | DCL               | DF                 |
|------|----------------------------------|-----------------------|-------------------|--------------------|
| 1    | +25°C                            | Specified Tolerance   | Catalog Limit     | Catalog Limit      |
| 2    | -55°C                            | ±20% of initial value | N/A               | Catalog Limit      |
| 3    | +25°C                            | ±10% of initial value | Catalog Limit     | Catalog Limit      |
| 4    | +85°C                            | ±20% of initial value | 10x Catalog Limit | 1.2x Catalog Limit |
| 5    | +105°C<br>(125°C for T525, T530) | ±30% of initial value | 10x Catalog Limit | 1.5x Catalog Limit |
| 6    | +25°C                            | ±10% of initial value | Catalog Limit     | Catalog Limit      |

### 13. Standard Life Test

• **85°C, Rated Voltage, 2000 Hours**

Post Test Performance:

- Capacitance: within -20%/+10% of initial value
- DF: within initial limit
- DC Leakage: within initial limit
- ESR: within initial limit

### 14. High Temperature Life Test - 2000 Hours

• **105°C, T520 - 1.0 x Rated Voltage; 125°C, T525, T530 - .67 x Rated Voltage**

Post Test Performance:

- Capacitance: within -20%/+10% of initial value
- DF: within initial limit
- DC Leakage: within 1.25 initial limits for T520; 2 x initial limit for T525, T530
- ESR: within 2 x initial limit for T520, T530  
ESR: within initial limit for T525

### 15. Storage Life Test

• **105°C, 0VDC, 2000 Hours for T520; 125°C for T525, T530**

Post Test Performance:

- Capacitance: within -20%/+10% of initial value
- DF: within initial limit
- DC Leakage: within 1.25 initial limits for T520; 2 x initial limit for T525, T530
- ESR: within 2 x initial limit for T520, T530  
ESR: within initial limit for T525

### 16. Thermal Shock

• **Mil-Std-202, Method 107, Condition B**

Minimum temperature is -55°C

Maximum temperature is +105°C for T520; 125°C for T525, T530

500 Cycles

Post Test Performance:

- Capacitance: within +10%/-20% of initial value
- DF: within initial limit
- DC Leakage: within initial limit
- ESR: within 2 x initial limit

### 17. Moisture Resistance Testing

• **J-Std-020**

Steps 7a and 7b excluded, 0V, 21 cycles

Post Test Performance:

- Capacitance: within ±30% of initial value
- DF: within initial limit
- DC Leakage: within initial limit
- ESR: within initial limit
- JEDEC J-STD-020C Meets MSL Level 3

### 18. Load Humidity

• **60°C, 90% RH, Rated Voltage, 500 Hours**

Post Test Performance:

- Capacitance: within +35%/-5% of initial value
- DF: within initial limit
- DC Leakage: within 5 x initial limit
- ESR: within 2 x initial limit

### 19. ESD

• **Polymer tantalum capacitors are not sensitive to Electro-Static Discharge (ESD).**

### 20. Failure Mechanism and Reliability

The normal failure mechanism is dielectric breakdown. Dielectric failure can result in high DC Leakage current and may proceed to the level of a short circuit. With sufficient time to charge, healing may occur by one of two potential mechanisms. The polymer adjacent to the dielectric fault site may overheat and vaporize, disconnecting the fault site from the circuit. The polymer may also

## COMPONENT PERFORMANCE CHARACTERISTICS

Conductive Polymer Surface Mount

oxidize into a more resistive material that eliminates the defect site in the dielectric and reduces the flow of current.

Capacitor failure may be induced by exceeding the rated conditions of forward DC voltage, reverse DC voltage, surge current, power dissipation or temperature. Excessive environmental stress, such as prolonged or high temperature reflow processes may also trigger dielectric failure.

Failure rates may be improved in application by derating the voltage applied to the capacitor. KEMET recommends that KO-CAPs be derated to 90% or less of the rated voltage in application for part types ≤ 10V. Parts > 10V should be derated to 80% or less of the rated voltage.

KO-CAPs exhibit a benign failure mode in that they do not fail catastrophically even under typical fault conditions. If a shorted capacitor is allowed to pass unlimited current, it may overheat and the case may discolor. But this is distinctly different from the “ignition” that may occur with standard MnO<sub>2</sub> cathode tantalums. Replacement of the MnO<sub>2</sub> by the polymer removes the oxygen that fuels ignition during a failure event.

### MECHANICAL

#### 21. Resistance to Solvents

- *Mil-Std-202, Method 215*

Post Test Performance:

- Capacitance — within ±10% of initial value
- DC Leakage — within initial limit
- Dissipation Factor — within initial limit
- ESR — within initial limit
- Physical — no degradation of case, terminals or marking

#### 22. Fungus

- *Mil-Std-810, Method 508*

#### 23. Flammability

- *UL94 VO Classification*

Encapsulant materials meet this classification

#### 24. Resistance to Soldering Heat

- *Maximum Reflow*  
**+240 ±5°C, 10 seconds**
- *Typical Reflow*  
**+230 ±5°C, 30 seconds**

Post Test Performance:

- Capacitance — within ±10% of initial value
- DC Leakage — within initial limit
- Dissipation Factor — within initial limit
- ESR — within initial limit

#### 25. Solderability

- *Mil-Std-202, Method 208*
- *ANSI/J-STD-002, Test B*

Applies to Solder Coated terminations only.

#### 26. Vibration

- *Mil-Std-202, Method 204, Condition D, 10 Hz to 2,000 Hz, 20G Peak*

Post Test Performance:

- Capacitance — within ±10% of initial value
- DC Leakage — within initial limit
- Dissipation Factor — within initial limit
- ESR — within initial limit

#### 27. Shock

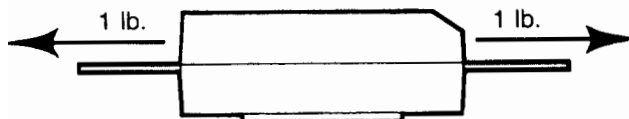
- *Mil-Std-202, Method 213, Condition I, 100 G Peak*

Post Test Performance:

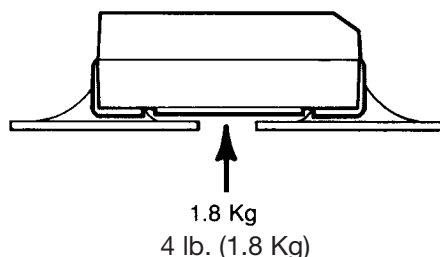
- Capacitance — within ±10% of initial value
- DC Leakage — within initial limit
- Dissipation Factor — within initial limit
- ESR - within initial limit

#### 28. Terminal Strength

- **Pull Force**  
• **One Pound (454 grams), 30 Seconds**



- **Tensile Force**  
• **Four Pounds (1.8 kilograms), 60 Seconds**

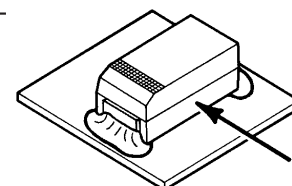


- **Shear Force**  
**Table 5 Maximum Shear Loads**

| Case Code |         | Maximum Shear Loads |        |
|-----------|---------|---------------------|--------|
| KEMET     | EIA     | Kilograms           | Pounds |
| A         | 3216-18 | 3.2                 | 7.0    |
| T         | 3528-12 | 3.6                 | 8.0    |
| B         | 3528-21 | 3.6                 | 8.0    |
| C         | 6032-28 | 4.5                 | 10.0   |
| V         | 7343-20 | 5.0                 | 11.0   |
| W         | 7343-15 | 5.0                 | 11.0   |
| D         | 7343-31 | 5.0                 | 11.0   |
| Y         | 7343-40 | 5.0                 | 11.0   |
| X         | 7343-43 | 5.0                 | 11.0   |

Post Test Performance:

- Capacitance — within ±5% of initial value
- DC Leakage — within initial limit
- Dissipation Factor — within initial limit
- ESR - within initial limit



## COMPONENT PERFORMANCE CHARACTERISTICS

### APPLICATIONS

#### 29. Handling

Automatic handling of encapsulated components is enhanced by the molded case which provides compatibility with all types of high speed pick and place equipment. Manual handling of these devices presents no unique problems. Care should be taken with your fingers, however, to avoid touching the solder-coated terminations as body oils, acids and salts will degrade the solderability of these terminations. Finger cots should be used whenever manually handling all solderable surfaces.

#### 30. Termination Coating

KEMET's standard termination finish is 100% Sn. Standard terminations can be ordered with a "T" suffix in the lead material designator of the KEMET part number. Components ordered with the "T" suffix are Pb-Free/RoHS compliant and are backward and forward compatible with SnPb and Pb-Free soldering processes.

90Sn/10Pb terminations are also available and can be ordered with an "H" suffix.

KEMET's "S" suffix remains an active termination designator for current designs but is not recommended for new designs. Parts ordered with an "S" suffix are not guaranteed to be Pb-Free or RoHS compliant. Refer to [www.kemet.com](http://www.kemet.com) for information on Pb-Free transition.

#### 31. Recommended Mounting Pad Geometries

Proper mounting pad geometries are essential for successful solder connections. These dimensions are highly process sensitive and should be designed

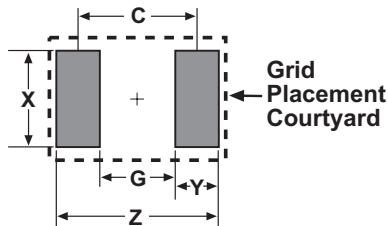


Table 6 - Land Pattern Dimensions for Reflow Solder

| KEMET/EIA Size Code   | Pad Dimensions |      |      |         |         |
|---|----------------|------|------|---------|---------|
|   | Z              | G    | X    | Y (ref) | C (ref) |
| B/3528-21, T/3528-12  | 5.00           | 1.10 | 2.50 | 1.95    | 3.05    |
| C/6032-28   | 7.60           | 2.50 | 2.50 | 2.55    | 5.05    |
| D/7343-31, V/7343-20,<br>W/7343-15, X/7343-43,<br>Y/7343-40 | 8.90           | 3.80 | 2.70 | 2.55    | 6.35    |

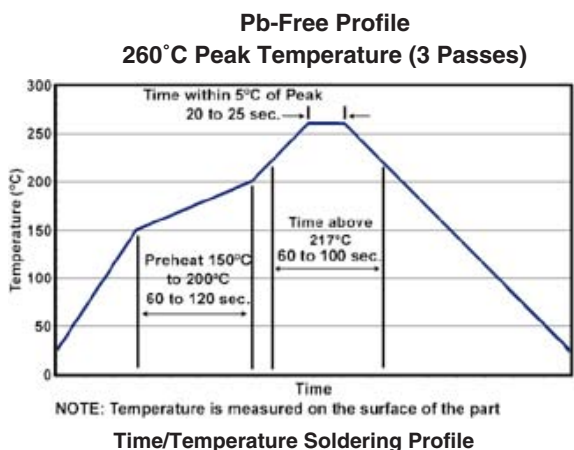
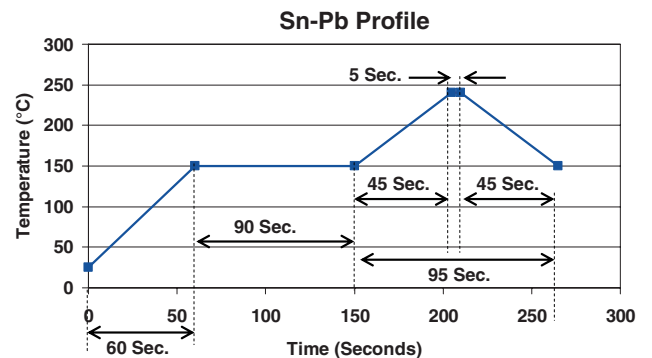
to maximize the integrity of the solder joint, and to minimize component rework due to unacceptable solder joints.

Figure 5 illustrates pad geometry. The table provides recommended pad dimensions for reflow soldering techniques. These dimensions are intended to be a starting point for circuit board designers, to be fine tuned, if necessary, based upon the peculiarities of the soldering process and/or circuit board design.

Visit [KEMET.com](http://KEMET.com) for Engineering Bulletin Number F-2100 entitled "Surface Mount Mounting Pad Dimensions and Considerations" for further details on this subject.

#### 32. Soldering

The T52X KO-CAP family has been designed for reflow solder processes. Solder-coated terminations have excellent wetting characteristics for high integrity solder fillets. Preheating of these components is recommended to avoid extreme thermal stress. Pb (lead) Free peak temperature is 260°C (with up to 3x reflow capabilities).



Hand-soldering should be avoided. If necessary, it should be performed with care due to the difficulty in process control. Care should be taken to avoid contact of the soldering iron to the molded case.

The iron should be used to heat the solder pad, applying solder between the pad and the termination, until reflow occurs. The iron should be removed. “Wiping” the edges of a chip and heating the top surface is not recommended.

During typical reflow operations a slight darkening of the gold-colored epoxy may be observed. This slight darkening is normal and is not harmful to the product. Marking permanency is not affected by this change.

The EIA standards for conductive polymer capacitors allows an ESR movement to 1.1 times (or 3 milliohms, whichever is greater) the catalog limit past mounting.

### 33. Washing

Standard washing techniques and solvents are compatible with all KEMET surface mount tantalum capacitors. Solvents such as Freon TMC and TMS, Trichlorethane, methylene chloride, prelete, and isopropyl alcohol are not harmful to these components. Please note that we are not endorsing the use of banned or restricted solvents. We are simply stating that they would not be harmful to the components.

If ultrasonic agitation is utilized in the cleaning process, care should be taken to minimize energy levels and exposure times to avoid damage to the terminations.

KEMET tantalum chips are also compatible with newer aqueous and semi-aqueous processes.

### 34. Encapsulations

Under normal circumstances, potting or encapsulation of KEMET tantalum chips is not required.

### 35. Storage Environment

Conductive polymer series (T520, T525, T528, T530) are shipped in moisture barrier bags with a desiccant and moisture indicator card. These series are classified as MSL (Moisture Sensitivity Level 3). Upon opening the moisture barrier bag, parts should be mounted within 7 days to prevent moisture absorption and outgassing. If the 7 day window is exceeded, the parts can be baked per the instructions on the bag (168 hours at 40±5°C).

Polymer chip capacitors should be stored in normal working environments. While the chips themselves are quite robust in other environments, solderability will be degraded by exposure to high temperatures, high humidity, corrosive atmospheres, and long term storage. In addition, packaging materials will be degraded by high temperature - reels may soften or warp, and tape peel force may increase. KEMET recommends that maximum storage temperature not exceed 40 degrees C, and the maximum storage humidity not exceed 60% relative humidity. In addition, temperature fluctuations should be minimized to avoid condensation on the parts, and atmospheres should be free of chlorine and sulfur bearing compounds. For optimized solderability, chip stock should be used promptly, preferably within 1.5 years of receipt.

## COMPONENT WEIGHTS

| Series | Case Size | Typical Weight (mg) |
|--------|-----------|---------------------|
| T52x   | A/3216-18 | 35                  |
| T52x   | B/3528-21 | 65                  |
| T52x   | C/6032-28 | 130                 |
| T52x   | D/7343-31 | 325                 |
| T52x   | X/7343-43 | 500                 |
| T52x   | T/3528-12 | 38                  |
| T52x   | W/7343-15 | 172                 |
| T52x   | V/7343-20 | 210                 |
| T530   | D/7343-31 | 342                 |
| T530   | Y/7343-40 | 480                 |
| T530   | X/7343-43 | 515                 |
| T530   | E/7360-38 | 650                 |



# KEMET CONDUCTIVE POLYMER CHIP CAPACITORS

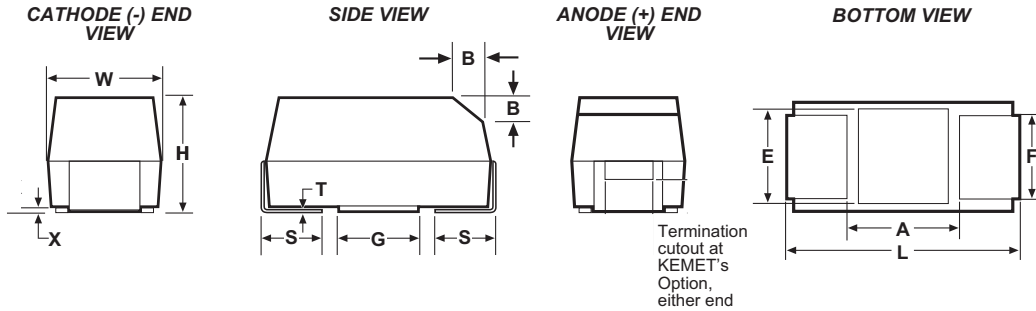
CHARGED™

## T520 Series - KO Cap

### FEATURES

- Polymer Cathode Technology
- Low ESR
- High Frequency Cap Retention
- No-Ignition Failure Mode
- Use Up to 90% of Rated Voltage (10% Derating) for part types ≤ 10 Volts
- Halogen Free Epoxy
- 100% Accelerated Steady State Aging
- Volumetrically Efficient
- Use Up to 80% of Rated Voltage (20% Derating) for part types > 10 Volts
- Capacitance 15 to 1000µF (±20%)
- Voltage 2V to 25V
- EIA Standard Case Sizes
- 100% Surge Current Tested
- Operating Temperature -55°C to +105°C
- Self Healing Mechanism
- RoHS Compliant & Leadfree Terminations (see www.kemet.com for lead transition)

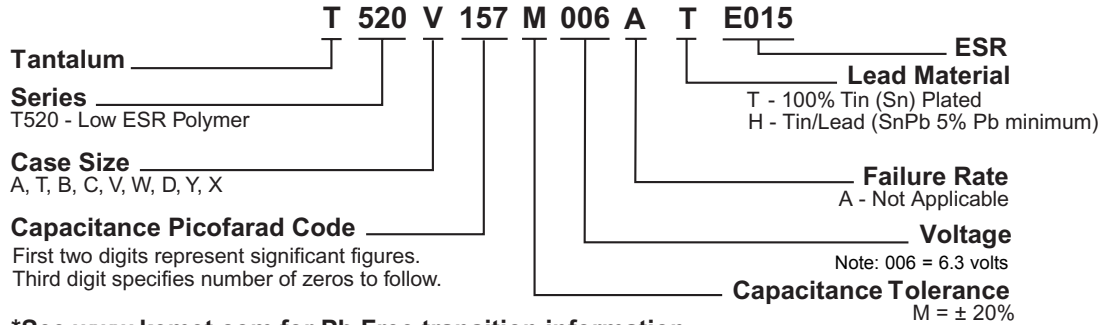
### OUTLINE DRAWING



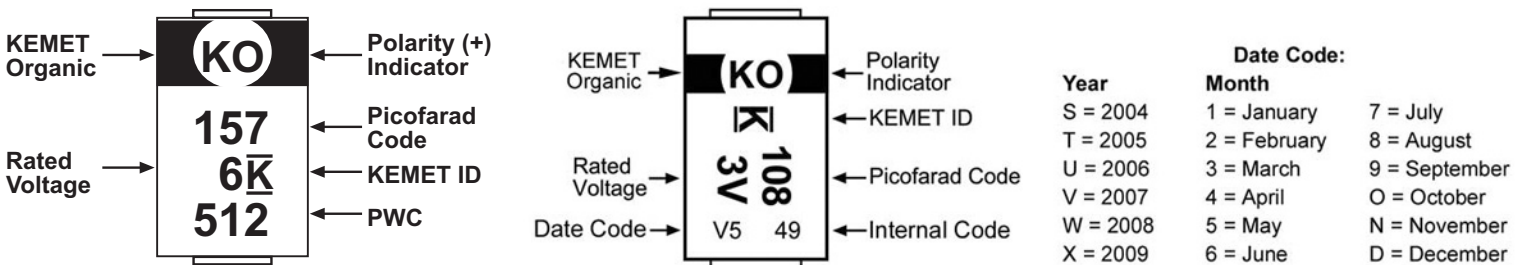
### DIMENSIONS - MILLIMETERS

| Case Size |         | L         | W         | H         | F ± 0.1 | S ± 0.3 | X(Ref)      | T(Ref) | A(Min) | G(ref) | E(ref) |
|-----------|---------|-----------|-----------|-----------|---------|---------|-------------|--------|--------|--------|--------|
| KEMET     | EIA     |           |           |           |         |         |             |        |        |        |        |
| A         | 3216-18 | 3.2 ± 0.2 | 1.6 ± 0.2 | 1.6 ± 0.2 | 1.2     | 0.8     | 0.10 ± 0.10 | 0.13   | 0.8    | 1.1    | 1.3    |
| T         | 3528-12 | 3.5 ± 0.2 | 2.8 ± 0.2 | 1.2 max   | 2.2     | 0.8     | 0.05        | 0.13   | 1.1    | 1.8    | 2.2    |
| M         | 3528-15 | 3.5 ± 0.2 | 2.8 ± 0.2 | 1.5 max   | 2.2     | 0.8     | 0.11        | 0.13   | 2.1    | 1.8    | 2.2    |
| B         | 3528-21 | 3.5 ± 0.2 | 2.8 ± 0.2 | 1.9 ± 0.1 | 2.2     | 0.8     | 0.10 ± 0.10 | 0.13   | 1.1    | 1.8    | 2.2    |
| U         | 6032-15 | 6.0 ± 0.3 | 3.2 ± 0.3 | 1.5 max   | 2.2     | 1.3     | 0.05        | 0.13   | 3.1    | 2.8    | 2.4    |
| L         | 6032-19 | 6.0 ± 0.3 | 3.2 ± 0.3 | 1.9 max   | 2.2     | 1.3     | 0.10 ± 0.10 | 0.13   | 2.5    | 2.8    | 2.4    |
| C         | 6032-28 | 6.0 ± 0.3 | 3.2 ± 0.3 | 2.5 ± 0.3 | 2.2     | 1.3     | 0.10 ± 0.10 | 0.13   | 2.5    | 2.8    | 2.4    |
| W         | 7343-15 | 7.3 ± 0.3 | 4.3 ± 0.3 | 1.5 max   | 2.4     | 1.3     | 0.05        | 0.13   | 3.8    | 3.5    | 3.5    |
| V         | 7343-20 | 7.3 ± 0.3 | 4.3 ± 0.3 | 1.9 max   | 2.4     | 1.3     | 0.05        | 0.13   | 3.8    | 3.5    | 3.5    |
| D         | 7343-31 | 7.3 ± 0.3 | 4.3 ± 0.3 | 2.8 ± 0.3 | 2.4     | 1.3     | 0.10 ± 0.10 | 0.13   | 3.8    | 3.5    | 3.5    |
| Y         | 7343-40 | 7.3 ± 0.3 | 4.3 ± 0.3 | 4.0 max   | 2.4     | 1.3     | 0.10 ± 0.10 | 0.13   | 3.8    | 3.5    | 3.5    |
| X         | 7343-43 | 7.3 ± 0.3 | 4.3 ± 0.3 | 4.0 ± 0.3 | 2.4     | 1.3     | 0.10 ± 0.10 | 0.13   | 3.8    | 3.5    | 3.5    |

### T520 ORDERING INFORMATION



### COMPONENT MARKING



512 = 12th week of 2005

# CONDUCTIVE POLYMER CHIP CAPACITORS

## T520 Series - KO Cap



### T520 RATINGS & PART NUMBER REFERENCE

| Rated Voltage (V) | Rated Capacitance (µF) | Case Code/ Case Size | KEMET Part Number    | DC Leakage µA @ 20°C max/ 5min | DF% @ 20°C 120 Hz Max | ESR mΩ @ 20°C 100 kHz Max | Maximum allowable ripple current (mA Arms) 100kHz* | MSL Reflow Temp ≤ 260°C |
|-------------------|------------------------|----------------------|----------------------|--------------------------------|-----------------------|---------------------------|--|-------------------------|
| 2                 | 470                    | V/7343-19            | T520V477M002A(1)E040 | 94                             | 10                    | 40                        | 2200   | 3                       |
|                   | 47                     | A/3216-18            | T520A476M2R5A(1)E090 | 12                             | 8                     | 90                        | 1100   |                         |
|                   | 56                     | T/3528-12            | T520T568M2R5A(1)E040 | 14                             | 6                     | 40                        | 1600   |                         |
|                   | 56                     | T/3528-12            | T520T568M2R5A(1)E070 | 14                             | 8                     | 70                        | 1200   |                         |
|                   | 68                     | A/3216-18            | T520A686M2R5A(1)E070 | 17                             | 8                     | 70                        | 1300   |                         |
|                   | 68                     | A/3216-18            | T520A686M2R5A(1)E080 | 17                             | 8                     | 80                        | 1200   |                         |
|                   | 100                    | T/3528-12            | T520T107M2R5A(1)E070 | 25                             | 8                     | 70                        | 1200   |                         |
|                   | 100                    | B/3528-20            | T520B107M2R5A(1)E025 | 25                             | 8                     | 25                        | 2300   |                         |
|                   | 100                    | B/3528-20            | T520B107M2R5A(1)E035 | 25                             | 8                     | 35                        | 1900   |                         |
|                   | 100                    | B/3528-20            | T520B107M2R5A(1)E040 | 25                             | 8                     | 40                        | 1800   |                         |
|                   | 100                    | B/3528-20            | T520B107M2R5A(1)E070 | 25                             | 8                     | 70                        | 1300   |                         |
|                   | 150                    | U/6032-15            | T520U157M2R5A(1)E055 | 38                             | 8                     | 55                        | 1600   |                         |
|                   | 220                    | B/3528-20            | T520B227M2R5A(1)E015 | 55                             | 8                     | 15                        | 2900   |                         |
|                   | 220                    | B/3528-20            | T520B227M2R5A(1)E018 | 55                             | 8                     | 15                        | 2900   |                         |
|                   | 220                    | B/3528-20            | T520B227M2R5A(1)E025 | 55                             | 8                     | 25                        | 2300   |                         |
|                   | 220                    | B/3528-20            | T520B227M2R5A(1)E030 | 55                             | 8                     | 30                        | 2100   |                         |
|                   | 220                    | B/3528-20            | T520B227M2R5A(1)E035 | 55                             | 8                     | 35                        | 1900   |                         |
|                   | 220                    | B/3528-20            | T520B227M2R5A(1)E070 | 55                             | 8                     | 70                        | 1300   |                         |
|                   | 220                    | C/6032-28            | T520C227M2R5A(1)E025 | 55                             | 8                     | 25                        | 2600   |                         |
|                   | 220                    | C/6032-28            | T520C227M2R5A(1)E045 | 55                             | 8                     | 45                        | 1900   |                         |
|                   | 220                    | V/7343-19            | T520V227M2R5A(1)E007 | 55                             | 10                    | 7                         | 5200   |                         |
|                   | 220                    | V/7343-19            | T520V227M2R5A(1)E009 | 55                             | 10                    | 9                         | 4600   |                         |
|                   | 220                    | V/7343-19            | T520V227M2R5A(1)E012 | 55                             | 10                    | 12                        | 3900   |                         |
|                   | 220                    | V/7343-19            | T520V227M2R5A(1)E015 | 55                             | 10                    | 15                        | 3500   |                         |
|                   | 220                    | V/7343-19            | T520V227M2R5A(1)E025 | 55                             | 10                    | 25                        | 2700   |                         |
|                   | 220                    | V/7343-19            | T520V227M2R5A(1)E045 | 55                             | 10                    | 45                        | 2000   |                         |
|                   | 220                    | D/7343-31            | T520D227M2R5A(1)E007 | 55                             | 10                    | 7                         | 5700   |                         |
|                   | 220                    | D/7343-31            | T520D227M2R5A(1)E040 | 55                             | 10                    | 40                        | 2400   |                         |
|                   | 330                    | B/3528-20            | T520B337M2R5A(1)E045 | 83                             | 8                     | 45                        | 1700   |                         |
|                   | 330                    | B/3528-20            | T520B337M2R5A(1)E070 | 83                             | 8                     | 70                        | 1300   |                         |
|                   | 330                    | C/6032-28            | T520C337M2R5A(1)E015 | 83                             | 8                     | 15                        | 3300   |                         |
|                   | 330                    | C/6032-28            | T520C337M2R5A(1)E018 | 83                             | 8                     | 18                        | 3000   |                         |
|                   | 330                    | C/6032-28            | T520C337M2R5A(1)E025 | 83                             | 8                     | 25                        | 2600   |                         |
|                   | 330                    | C/6032-28            | T520C337M2R5A(1)E045 | 83                             | 8                     | 45                        | 1900   |                         |
|                   | 330                    | U/6032-20            | T520L337M2R5A(1)E012 | 83                             | 10                    | 12                        | 3500   |                         |
| 2.5               | 330                    | U/6032-20            | T520L337M2R5A(1)E025 | 83                             | 10                    | 25                        | 2400   | 3                       |
|                   | 330                    | W/7343-15            | T520W337M2R5A(1)E025 | 83                             | 10                    | 25                        | 2200   |                         |
|                   | 330                    | W/7343-15            | T520W337M2R5A(1)E040 | 83                             | 10                    | 40                        | 1700   |                         |
|                   | 330                    | V/7343-19            | T520V337M2R5A(1)E006 | 83                             | 10                    | 6                         | 5600   |                         |
|                   | 330                    | V/7343-19            | T520V337M2R5A(1)E007 | 83                             | 10                    | 7                         | 5200   |                         |
|                   | 330                    | V/7343-19            | T520V337M2R5A(1)E009 | 83                             | 10                    | 9                         | 4600   |                         |
|                   | 330                    | V/7343-19            | T520V337M2R5A(1)E012 | 83                             | 10                    | 12                        | 3900   |                         |
|                   | 330                    | V/7343-19            | T520V337M2R5A(1)E015 | 83                             | 10                    | 15                        | 3500   |                         |
|                   | 330                    | V/7343-19            | T520V337M2R5A(1)E018 | 83                             | 10                    | 18                        | 3200   |                         |
|                   | 330                    | V/7343-19            | T520V337M2R5A(1)E025 | 83                             | 10                    | 25                        | 2700   |                         |
|                   | 330                    | V/7343-19            | T520V337M2R5A(1)E040 | 83                             | 10                    | 40                        | 2200   |                         |
|                   | 330                    | D/7343-31            | T520D337M2R5A(1)E006 | 83                             | 10                    | 6                         | 6100   |                         |
|                   | 330                    | D/7343-31            | T520D337M2R5A(1)E007 | 83                             | 10                    | 7                         | 5700   |                         |
|                   | 470                    | V/7343-19            | T520V477M2R5A(1)E007 | 118                            | 10                    | 7                         | 5200   |                         |
|                   | 470                    | V/7343-19            | T520V477M2R5A(1)E009 | 118                            | 10                    | 9                         | 4600   |                         |
|                   | 470                    | V/7343-19            | T520V477M2R5A(1)E012 | 118                            | 10                    | 12                        | 3900   |                         |
|                   | 470                    | V/7343-19            | T520V477M2R5A(1)E015 | 118                            | 10                    | 15                        | 3500   |                         |
|                   | 470                    | V/7343-19            | T520V477M2R5A(1)E018 | 118                            | 10                    | 18                        | 3200   |                         |
|                   | 470                    | C/6032-28            | T520C477M2R5A(1)E025 | 118                            | 8                     | 25                        | 2600   |                         |
|                   | 470                    | C/6032-28            | T520C477M2R5A(1)E045 | 118                            | 8                     | 45                        | 1900   |                         |
|                   | 470                    | D/7343-31            | T520D477M2R5A(1)E006 | 118                            | 10                    | 6                         | 6100   |                         |
|                   | 470                    | D/7343-31            | T520D477M2R5A(1)E007 | 118                            | 10                    | 7                         | 5700   |                         |
|                   | 470                    | D/7343-31            | T520D477M2R5A(1)E009 | 118                            | 10                    | 9                         | 5000   |                         |
|                   | 680                    | D/7343-31            | T520D687M2R5A(1)E010 | 170                            | 10                    | 10                        | 4700   |                         |
|                   | 680                    | D/7343-31            | T520D687M2R5A(1)E015 | 170                            | 10                    | 15                        | 3900   |                         |
|                   | 680                    | D/7343-31            | T520D687M2R5A(1)E040 | 170                            | 10                    | 40                        | 2400   |                         |
|                   | 680                    | Y/7343-40            | T520Y687M2R5A(1)E015 | 170                            | 10                    | 15                        | 4000   |                         |
|                   | 680                    | Y/7343-40            | T520Y687M2R5A(1)E025 | 170                            | 10                    | 25                        | 3100   |                         |
|                   | 1000                   | D/7343-31            | T520D108M2R5A(1)E015 | 250                            | 8                     | 15                        | 3900   |                         |
|                   | 1000                   | D/7343-31            | T520D108M2R5A(1)E030 | 250                            | 10                    | 30                        | 2700   |                         |
|                   | 1000                   | Y/7343-40            | T520Y108M2R5A(1)E010 | 250                            | 10                    | 10                        | 4900   |                         |
|                   | 1000                   | Y/7343-40            | T520Y108M2R5A(1)E015 | 250                            | 10                    | 15                        | 4000   |                         |
|                   | 1000                   | Y/7343-40            | T520Y108M2R5A(1)E025 | 250                            | 10                    | 25                        | 3100   |                         |
|                   | 1000                   | X/7343-43            | T520X108M2R5A(1)E010 | 250                            | 10                    | 10                        | 5000   |                         |

\*100kHz to 500kHz, 45° C

| Rated Voltage (V) | Rated Capacitance (µF) | Case Code/ Case Size | KEMET Part Number    | DC Leakage µA @ 20°C max/ 5min | DF% @ 20°C 120 Hz Max | ESR mΩ @ 20°C 100 kHz Max | Maximum allowable ripple current (mA Arms) 100kHz* | MSL Reflow Temp ≤ 260°C |
|-------------------|------------------------|----------------------|----------------------|--------------------------------|-----------------------|---------------------------|--|-------------------------|
|                   | 100                    | B/3528-20            | T520B107M003A(1)E025 | 30                             | 8                     | 25                        | 2300   |                         |
|                   | 100                    | B/3528-20            | T520B107M003A(1)E035 | 30                             | 8                     | 35                        | 1900   |                         |
|                   | 100                    | B/3528-20            | T520B107M003A(1)E040 | 30                             | 8                     | 40                        | 1800   |                         |
|                   | 100                    | B/3528-20            | T520B107M003A(1)E070 | 30                             | 8                     | 70                        | 1300   |                         |
|                   | 150                    | B/3528-20            | T520B157M003A(1)E035 | 45                             | 8                     | 35                        | 1900   |                         |
|                   | 150                    | B/3528-20            | T520B157M003A(1)E040 | 45                             | 8                     | 40                        | 1800   |                         |
|                   | 150                    | B/3528-20            | T520B157M003A(1)E070 | 45                             | 8                     | 70                        | 1300   |                         |
| 3                 | 130                    | V/7343-19            | T520V337M003A(1)E009 | 99                             | 10                    | 9                         | 4600   | 3                       |
|                   | 330                    | V/7343-19            | T520V337M003A(1)E012 | 99                             | 10                    | 12                        | 3900   |                         |
|                   | 330                    | V/7343-19            | T520V337M003A(1)E015 | 99                             | 10                    | 15                        | 3500   |                         |
|                   | 330                    | V/7343-19            | T520V337M003A(1)E025 | 99                             | 10                    | 25                        | 2700   |                         |
|                   | 680                    | D/7343-31            | T520D687M003A(1)E015 | 204                            | 10                    | 15                        | 3900   |                         |
|                   | 680                    | D/7343-31            | T520D687M003A(1)E040 | 204                            | 10                    | 40                        | 2400   |                         |
|                   | 1000                   | X/7343-43            | T520X108M003A(1)E015 | 300                            | 10                    | 15                        | 4100   |                         |
|                   | 1000                   | X/7343-43            | T520X108M003A(1)E030 | 300                            | 10                    | 30                        | 2900   |                         |
|                   | 15                     | T/3528-12            | T520T156M004A(1)E100 | 6                              | 8                     | 100                       | 1000   |                         |
|                   | 33                     | A/3216-18            | T520A336M004A(1)E070 | 13                             | 8                     | 70                        | 1300   |                         |
|                   | 33                     | A/3216-18            | T520A336M004A(1)E080 | 13                             | 8                     | 80                        | 1200   |                         |
|                   | 47                     | A/3216-18            | T520A476M004A(1)E070 | 19                             | 8                     | 70                        | 1300   |                         |
|                   | 47                     | A/3216-18            | T520A476M004A(1)E080 | 19                             | 8                     | 80                        | 1200   |                         |
|                   | 47                     | T/3528-12            | T520T476M004A(1)E070 | 19                             | 8                     | 70                        | 1200   |                         |
|                   | 68                     | T/3528-12            | T520T686M004A(1)E070 | 27                             | 8                     | 70                        | 1200   |                         |
|                   | 68                     | B/3528-20            | T520B686M004A(1)E025 | 27                             | 8                     | 25                        | 2300   |                         |
|                   | 68                     | B/3528-20            | T520B686M004A(1)E035 | 27                             | 8                     | 35                        | 1900   |                         |
|                   | 68                     | B/3528-20            | T520B686M004A(1)E040 | 27                             | 8                     | 40                        | 1800   |                         |
|                   | 68                     | B/3528-20            | T520B686M004A(1)E070 | 27                             | 8                     | 70                        | 1300   |                         |
|                   | U/6032-15              | T520U686M004A(1)E055 | 27                   | 8                              | 55                    | 1600                      |  |                         |
|                   | 100                    | T/3528-12            | T520T107M004A(1)E070 | 40                             | 10                    | 70                        | 1200   |                         |
|                   | 100                    | T/3528-12            | T520T107M004A(1)E150 | 40                             | 10                    | 150                       | 800  |                         |
|                   | 100                    | B/3528-20            | T520B107M004A(1)E025 | 40                             | 8                     | 25                        | 2300   |                         |
|                   | 100                    | B/3528-20            | T520B107M004A(1)E035 | 40                             | 8                     | 35                        | 1900   |                         |
|                   | 100                    | B/3528-20            | T520B107M004A(1)E040 | 40                             | 8                     | 40                        | 1800   |                         |
|                   | 100                    | B/3528-20            | T520B107M004A(1)E070 | 40                             | 8                     | 70                        | 1300   |                         |
|                   | 100                    | U/6032-15            | T520U107M004A(1)E055 | 40                             | 8                     | 55                        | 1600   |                         |
|                   | 150                    | B/3528-20            | T520B157M004A(1)E015 | 60                             | 8                     | 15                        | 2900   |                         |
|                   | 150                    | B/3528-20            | T520B157M004A(1)E018 | 60                             | 8                     | 18                        | 2700   |                         |
|                   | 150                    | B/3528-20            | T520B157M004A(1)E035 | 60                             | 8                     | 35                        | 1900   |                         |
|                   | 150                    | B/3528-20            | T520B157M004A(1)E040 | 60                             | 8                     | 40                        | 1800   |                         |
|                   | 150                    | B/3528-20            | T520B157M004A(1)E070 | 60                             | 8                     | 70                        | 1300   |                         |
|                   | 150                    | U/6032-15            | T520U157M004A(1)E055 | 60                             | 8                     | 55                        | 1600   |                         |
|                   | 150                    | C/6032-28            | T520C157M004A(1)E015 | 60                             | 8                     | 15                        | 3300   |                         |
|                   | 150                    | C/6032-28            | T520C157M004A(1)E025 | 60                             | 8                     | 25                        | 2600   |                         |
| 4                 | 150                    | C/6032-28            | T520C157M004A(1)E045 | 60                             | 8                     | 45                        | 1900   | 3                       |
|                   | 150                    | C/6032-28            | T520C157M004A(1)E100 | 60                             | 8                     | 100                       | 1300   |                         |
|                   | 150                    | V/7343-19            | T520V157M004A(1)E007 | 60                             | 10                    | 7                         | 5200   |                         |
|                   | 150                    | V/7343-19            | T520V157M004A(1)E009 | 60                             | 10                    | 9                         | 4600   |                         |
|                   | 150                    | V/7343-19            | T520V157M004A(1)E012 | 60                             | 10                    | 12                        | 3900   |                         |
|                   | 150                    | V/7343-19            | T520V157M004A(1)E015 | 60                             | 10                    | 15                        | 3500   |                         |
|                   | 150                    | V/7343-19            | T520V157M004A(1)E025 | 60                             | 10                    | 25                        | 2700   |                         |
|                   | 150                    | D/7343-31            | T520D157M004A(1)E007 | 60                             | 10                    | 7                         | 5700   |                         |
|                   | 220                    | B/3528-20            | T520B                |                                |                       |                           |  |                         |

**T520 RATINGS & PART NUMBER REFERENCE**

| Rated Voltage (V) | Rated Capacitance (µF) | Case Code/ Case Size | KEMET Part Number    | DC Leakage µA @ 20°C max/ 5min | DF% @ 20°C 120 Hz Max | ESR mΩ @ 20°C 100 kHz Max | Maximum allowable ripple current (mA rms) 100kHz* | MSL Reflow Temp ≤ 260°C |
|-------------------|------------------------|----------------------|----------------------|--------------------------------|-----------------------|---------------------------|---|-------------------------|
| 4                 | 220                    | D/7343-31            | T520D227M004A(1)E006 | 88                             | 10                    | 6                         | 6100  | 3                       |
|                   | 220                    | D/7343-31            | T520D227M004A(1)E007 | 88                             | 10                    | 7                         | 5700  |                         |
|                   | 220                    | D/7343-31            | T520D227M004A(1)E012 | 88                             | 10                    | 12                        | 4300  |                         |
|                   | 220                    | D/7343-31            | T520D227M004A(1)E065 | 88                             | 10                    | 65                        | 1900  |                         |
|                   | 330                    | C/6032-28            | T520C337M004A(1)E025 | 132                            | 8                     | 25                        | 2600  |                         |
|                   | 330                    | V/7343-19            | T520V337M004A(1)E007 | 132                            | 10                    | 7                         | 5200  |                         |
|                   | 330                    | V/7343-19            | T520V337M004A(1)E009 | 132                            | 10                    | 9                         | 4600  |                         |
|                   | 330                    | V/7343-19            | T520V337M004A(1)E012 | 132                            | 10                    | 12                        | 3900  |                         |
|                   | 330                    | V/7343-19            | T520V337M004A(1)E018 | 132                            | 10                    | 18                        | 3200  |                         |
|                   | 330                    | V/7343-19            | T520V337M004A(1)E025 | 132                            | 10                    | 25                        | 2700  |                         |
|                   | 330                    | V/7343-19            | T520V337M004A(1)E040 | 132                            | 10                    | 40                        | 2200  |                         |
|                   | 330                    | D/7343-31            | T520D337M004A(1)E006 | 132                            | 10                    | 6                         | 6100  |                         |
|                   | 330                    | D/7343-31            | T520D337M004A(1)E007 | 132                            | 10                    | 7                         | 5700  |                         |
|                   | 330                    | D/7343-31            | T520D337M004A(1)E009 | 132                            | 10                    | 9                         | 5000  |                         |
|                   | 330                    | D/7343-31            | T520D337M004A(1)E012 | 132                            | 10                    | 12                        | 4300  |                         |
|                   | 330                    | D/7343-31            | T520D337M004A(1)E015 | 132                            | 10                    | 15                        | 3900  |                         |
|                   | 330                    | D/7343-31            | T520D337M004A(1)E018 | 132                            | 10                    | 18                        | 3500  |                         |
|                   | 330                    | D/7343-31            | T520D337M004A(1)E025 | 132                            | 10                    | 25                        | 3000  |                         |
|                   | 330                    | D/7343-31            | T520D337M004A(1)E040 | 132                            | 10                    | 40                        | 2400  |                         |
|                   | 330                    | D/7343-31            | T520D337M004A(1)E045 | 132                            | 8                     | 45                        | 2200  |                         |
|                   | 470                    | D/7343-31            | T520D477M004A(1)E010 | 188                            | 10                    | 10                        | 4700  |                         |
|                   | 470                    | D/7343-31            | T520D477M004A(1)E012 | 188                            | 10                    | 12                        | 4300  |                         |
|                   | 470                    | D/7343-31            | T520D477M004A(1)E015 | 188                            | 10                    | 15                        | 3900  |                         |
|                   | 470                    | D/7343-31            | T520D477M004A(1)E018 | 188                            | 10                    | 18                        | 3500  |                         |
|                   | 470                    | D/7343-31            | T520D477M004A(1)E025 | 188                            | 10                    | 25                        | 3000  |                         |
|                   | 470                    | D/7343-31            | T520D477M004A(1)E040 | 188                            | 10                    | 40                        | 2400  |                         |
|                   | 680                    | D/7343-31            | T520D687M004A(1)E012 | 272                            | 10                    | 12                        | 4300  |                         |
|                   | 680                    | D/7343-31            | T520D687M004A(1)E015 | 272                            | 10                    | 15                        | 3900  |                         |
|                   | 680                    | D/7343-31            | T520D687M004A(1)E025 | 272                            | 10                    | 25                        | 3000  |                         |
|                   | 680                    | Y/7343-40            | T520Y687M004A(1)E010 | 272                            | 10                    | 10                        | 4900  |                         |
|                   | 680                    | Y/7343-40            | T520Y687M004A(1)E015 | 272                            | 10                    | 15                        | 4000  |                         |
|                   | 680                    | Y/7343-40            | T520Y687M004A(1)E025 | 272                            | 10                    | 25                        | 3100  |                         |
|                   | 680                    | X/7343-43            | T520X687M004A(1)E010 | 272                            | 10                    | 10                        | 5000  |                         |
|                   | 680                    | X/7343-43            | T520X687M004A(1)E015 | 272                            | 10                    | 15                        | 4100  |                         |
|                   | 680                    | X/7343-43            | T520X687M004A(1)E035 | 272                            | 10                    | 35                        | 2700  |                         |
|                   | 15                     | T/3528-12            | T520T156M006A(1)E100 | 9.5                            | 8                     | 100                       | 1000  |                         |
|                   | 22                     | A/3216-18            | T520A226M006A(1)E090 | 14                             | 8                     | 90                        | 1100  |                         |
|                   | 22                     | A/3216-18            | T520A226M006A(1)E100 | 14                             | 8                     | 100                       | 1100  |                         |
|                   | 33                     | A/3216-18            | T520A336M006A(1)E070 | 21                             | 8                     | 70                        | 1300  |                         |
|                   | 33                     | A/3216-18            | T520A336M006A(1)E080 | 21                             | 8                     | 80                        | 1200  |                         |
| 33                | T/3528-12              | T520T336M006A(1)E070 | 21                   | 8                              | 70                    | 1200                      |   |                         |
| 33                | B/3528-20              | T520B336M006A(1)E025 | 21                   | 8                              | 25                    | 2300                      |   |                         |
| 33                | B/3528-20              | T520B336M006A(1)E035 | 21                   | 8                              | 35                    | 1900                      |   |                         |
| 33                | B/3528-20              | T520B336M006A(1)E040 | 21                   | 8                              | 40                    | 1800                      |   |                         |
| 33                | B/3528-20              | T520B336M006A(1)E070 | 21                   | 8                              | 70                    | 1300                      |   |                         |
| 47                | T/3528-12              | T520T476M006A(1)E040 | 30                   | 8                              | 40                    | 1600                      |   |                         |
| 47                | T/3528-12              | T520T476M006A(1)E070 | 30                   | 8                              | 70                    | 1200                      |   |                         |
| 47                | B/3528-20              | T520B476M006A(1)E025 | 30                   | 8                              | 25                    | 2300                      |   |                         |
| 47                | B/3528-20              | T520B476M006A(1)E035 | 30                   | 8                              | 35                    | 1900                      |   |                         |
| 47                | B/3528-20              | T520B476M006A(1)E040 | 30                   | 8                              | 40                    | 1800                      |   |                         |
| 47                | B/3528-20              | T520B476M006A(1)E070 | 30                   | 8                              | 70                    | 1300                      |   |                         |
| 68                | B/3528-20              | T520B686M006A(1)E025 | 43                   | 8                              | 25                    | 2300                      |   |                         |
| 68                | B/3528-20              | T520B686M006A(1)E035 | 43                   | 8                              | 35                    | 1900                      |   |                         |
| 68                | B/3528-20              | T520B686M006A(1)E040 | 43                   | 8                              | 40                    | 1800                      |   |                         |
| 68                | B/3528-20              | T520B686M006A(1)E070 | 43                   | 8                              | 70                    | 1300                      |   |                         |
| 68                | U/6032-15              | T520U686M006A(1)E055 | 43                   | 8                              | 55                    | 1600                      |   |                         |
| 68                | U/6032-15              | T520U686M006A(1)E070 | 43                   | 10                             | 70                    | 1400                      |   |                         |
| 68                | T/3528-12              | T520T686M006A(1)E150 | 43                   | 10                             | 150                   | 800                       |   |                         |
| 100               | B/3528-20              | T520B107M006A(1)E015 | 63                   | 8                              | 15                    | 2900                      |   |                         |
| 100               | B/3528-20              | T520B107M006A(1)E018 | 63                   | 8                              | 18                    | 2700                      |   |                         |
| 100               | B/3528-20              | T520B107M006A(1)E040 | 63                   | 8                              | 40                    | 1800                      |   |                         |
| 100               | B/3528-20              | T520B107M006A(1)E045 | 63                   | 8                              | 45                    | 1700                      |   |                         |
| 100               | B/3528-20              | T520B107M006A(1)E070 | 63                   | 8                              | 70                    | 1300                      |   |                         |
| 100               | U/6032-15              | T520U107M006A(1)E055 | 63                   | 8                              | 55                    | 1600                      |   |                         |
| 100               | W/7343-15              | T520W107M006A(1)E040 | 63                   | 10                             | 40                    | 2100                      |   |                         |
| 100               | V/7343-19              | T520V107M006A(1)E007 | 63                   | 10                             | 7                     | 5200                      |   |                         |
| 100               | V/7343-19              | T520V107M006A(1)E009 | 63                   | 10                             | 9                     | 4600                      |   |                         |
| 100               | V/7343-19              | T520V107M006A(1)E012 | 63                   | 10                             | 12                    | 3900                      |   |                         |
| 100               | V/7343-19              | T520V107M006A(1)E015 | 63                   | 10                             | 15                    | 3500                      |   |                         |
| 100               | V/7343-19              | T520V107M006A(1)E045 | 63                   | 10                             | 45                    | 2000                      |   |                         |
| 100               | C/6032-28              | T520C107M006A(1)E025 | 63                   | 8                              | 25                    | 2600                      |   |                         |
| 100               | C/6032-28              | T520C107M006A(1)E045 | 63                   | 8                              | 45                    | 1900                      |   |                         |
| 100               | D/7343-31              | T520D107M006A(1)E007 | 63                   | 10                             | 7                     | 5700                      |   |                         |

\*100kHz to 500kHz, 45° C

| Rated Voltage (V) | Rated Capacitance (µF) | Case Code/ Case Size | KEMET Part Number    | DC Leakage µA @ 20°C max/ 5min | DF% @ 20°C 120 Hz Max | ESR mΩ @ 20°C 100 kHz Max | Maximum allowable ripple current (mA rms) 100kHz* | MSL Reflow Temp ≤ 260°C |
|-------------------|------------------------|----------------------|----------------------|--------------------------------|-----------------------|---------------------------|---|-------------------------|
| 6.3               | 120                    | B/3528-20            | T520B127M006A(1)E035 | 76                             | 8                     | 35                        | 1900  | 3                       |
|                   | 150                    | B/3528-20            | T520B157M006A(1)E035 | 95                             | 8                     | 35                        | 1900  |                         |
|                   | 150                    | B/3528-20            | T520B157M006A(1)E045 | 95                             | 8                     | 45                        | 1700  |                         |
|                   | 150                    | B/3528-20            | T520B157M006A(1)E070 | 95                             | 8                     | 70                        | 1300  |                         |
|                   | 150                    | M/3528-15            | T520M157M006A(1)E150 | 95                             | 10                    | 150                       | 900   |                         |
|                   | 150                    | M/3528-15            | T520M157M006A(1)E200 | 95                             | 8                     | 200                       | 800   |                         |
|                   | 150                    | C/6032-28            | T520C157M006A(1)E025 | 95                             | 8                     | 25                        | 2600  |                         |
|                   | 150                    | C/6032-28            | T520C157M006A(1)E045 | 95                             | 8                     | 45                        | 1900  |                         |
|                   | 150                    | U/6032-15            | T520U157M006A(1)E045 | 95                             | 8                     | 45                        | 1700  |                         |
|                   | 150                    | U/6032-15            | T520U157M006A(1)E055 | 95                             | 8                     | 55                        | 1600  |                         |
|                   | 150                    | L/6032-20            | T520L157M006A(1)E012 | 95                             | 8                     | 12                        | 3500  |                         |
|                   | 150                    | L/6032-20            | T520L157M006A(1)E025 | 95                             | 10                    | 25                        | 2400  |                         |
|                   | 150                    | W/7343-15            | T520W157M006A(1)E025 | 95                             | 10                    | 25                        | 2700  |                         |
|                   | 150                    | W/7343-15            | T520W157M006A(1)E040 | 95                             | 10                    | 40                        | 2100  |                         |
|                   | 150                    | V/7343-19            | T520V157M006A(1)E007 | 95                             | 10                    | 7                         | 5200  |                         |
|                   | 150                    | V/7343-19            | T520V157M006A(1)E009 | 95                             | 10                    | 9                         | 4600  |                         |
|                   | 150                    | V/7343-19            | T520V157M006A(1)E012 | 95                             | 10                    | 12                        | 3900  |                         |
|                   | 150                    | V/7343-19            | T520V157M006A(1)E015 | 95                             | 10                    | 15                        | 3500  |                         |
|                   | 150                    | V/7343-19            | T520V157M006A(1)E025 | 95                             | 10                    | 25                        | 2700  |                         |
|                   | 150                    | V/7343-19            | T520V157M006A(1)E040 | 95                             | 10                    | 40                        | 2200  |                         |
|                   | 150                    | V/7343-19            | T520V157M006A(1)E045 | 95                             | 10                    | 45                        | 2000  |                         |
|                   | 150                    | D/7343-31            | T520D157M006A(1)E006 | 95                             | 10                    | 6                         | 6100  |                         |
|                   | 150                    | D/7343-31            | T520D157M006A(1)E007 | 95                             | 10                    | 7                         | 5700  |                         |
|                   | 150                    | D/7343-31            | T520D157M006A(1)E015 | 95                             | 10                    | 15                        | 3900  |                         |
|                   | 150                    | D/7343-31            | T520D157M006A(1)E025 | 95                             | 10                    | 25                        | 3000  |                         |
|                   | 150                    | D/7343-31            | T520D157M006A(1)E055 | 95                             | 10                    | 55                        | 2000  |                         |
|                   | 220                    | C/6032-28            | T520C227M006A(1)E015 | 139                            | 8                     | 15                        | 3300  |                         |
|                   | 220                    | C/6032-28            | T520C227M006A(1)E018 | 139                            | 8                     | 18                        | 3000  |                         |
|                   | 220                    | C/6032-28            | T520C227M006A(1)E025 | 139                            | 8                     | 25                        | 2600  |                         |
|                   | 220                    | C/6032-28            | T520C227M006A(1)E045 | 139                            | 8                     | 45                        | 1900  |                         |
|                   | 220                    | V/7343-19            | T520V227M006A(1)E007 | 139                            | 10                    | 7                         | 5200  |                         |
|                   | 220                    | V/7343-19            | T520V227M006A(1)E009 | 139                            | 10                    | 9                         | 4600  |                         |
|                   | 220                    | V/7343-19            | T520V227M006A(1)E012 | 139                            | 10                    | 12                        | 3900  |                         |
|                   | 220                    | V/7343-19            | T520V227M006A(1)E015 | 139                            | 10                    | 15                        | 3500  |                         |
|                   | 220                    | V/7343-19            | T520V227M006A(1)E025 | 139                            | 10                    | 25                        | 2700  |                         |
|                   | 220                    | V/7343-19            | T520V227M006A(1)E040 | 139                            | 10                    | 40                        | 2200  |                         |
|                   | 220                    | D/7343-31            | T520D227M006A(1)E006 | 139                            | 10                    | 6                         | 6100  |                         |
|                   | 220                    | D/7343-31            | T520D227M006A(1)E007 | 139                            | 10                    | 7                         | 5700  |                         |
|                   | 220                    | D/7343-31            | T520D227M006A(1)E009 | 139                            | 10                    | 9                         | 5000  |                         |
|                   | 220                    | D/7343-31            | T520D227M006A(1)E015 | 139                            | 10                    | 15                        | 3900  |                         |
| 220               | D/7343-31              | T520D227M006A(1)E018 | 139                  | 10                             | 18                    | 3500                      |   |                         |
| 220               | D/7343-31              | T520D227M006A(1)E025 | 139                  | 10                             | 25                    | 3000                      |   |                         |
| 220               | D/7343-31              | T520D227M006A(1)E040 | 139                  | 10                             | 40                    | 2400                      |   |                         |
| 220               | D/7343-31              | T520D227M006A(1)E050 | 139                  | 10                             | 50                    | 2100                      |   |                         |
| 330               | V/7343-19              | T520V337M006A(1)E015 | 208                  | 10                             | 15                    | 3500                      |   |                         |
| 330               | V/7343-19              | T520V337M006A(1)E018 | 208                  | 10                             | 18                    | 3200                      |   |                         |
| 330               | V/7343-19              | T520V337M006A(1)E025 | 208                  | 10                             | 25                    | 2700                      |   |                         |
| 330               | V/7343-19              | T520V337M006A(1)E040 | 208                  | 10                             | 40                    | 2200                      |   |                         |
| 330               | V/7343-19              | T520V337M006A(1)E045 | 208                  | 10                             | 45                    | 2000                      |   |                         |
| 330               | D/7343-31              | T520D337M006A(1)E009 | 208                  | 10                             | 9                     | 5000                      |   |                         |
| 330               | D/7343-31              | T520D337M006A(1)E010 | 208                  | 10                             | 10                    | 4700                      |   |                         |
| 330               | D/7343-31              | T520D337M006A(1)E015 | 208                  | 10                             | 15                    | 3900                      |   |                         |
| 330               | D/7343-31              | T520D337M006A(1)E018 | 208                  | 10                             | 18                    | 3500                      |   |                         |
| 330               | D/7343-31              | T520D337M006A(1)E025 | 208                  | 10                             | 25                    | 3000                      |   |                         |
| 330               | D/7343-31              | T520D337M006A(1)E040 | 208                  | 10                             | 40                    | 2400                      |   |                         |
| 330               | D/7343-31              | T520D337M006A(1)E045 | 208                  | 10                             | 45                    | 2200                      |   |                         |
| 330               | Y/7343-40              | T520Y337M006A(1)E015 | 208                  | 10                             | 15                    | 4000                      |   |                         |
| 330               | Y/7343-40              | T520Y337M006A(1)E025 | 208                  | 10                             | 25                    | 3100                      |   |                         |
| 330               | Y/7343-40              | T520Y337M006A(1)E040 | 208                  | 10                             | 40                    | 2500                      |   |                         |
| 470               | Y/7343-40              | T520Y477M006A(1)E010 | 296                  | 10                             | 10                    | 4900                      |   |                         |
| 470               | Y/7343-40              | T520Y477M006A(1)E015 | 296                  | 10                             | 15                    | 4000                      |   |                         |
| 470               | Y/7343-40              | T520Y477M006A(1)E018 | 296                  | 10                             | 18                    | 3700                      |   |                         |
| 470               | Y/7343-40              | T520Y477M006A(1)E025 | 296                  | 10                             | 25                    | 3100                      |   |                         |
| 470               | Y/7343-40              | T520Y477M006A(1)E035 | 296                  | 10                             | 35                    | 2600                      |   |                         |
| 470               | D/7343-31              | T520D477M006A(1)E025 | 296                  | 10                             | 25                    | 3000                      |   |                         |
| 470               | D/7343-31              | T520D477M006A(1)E030 | 296                  | 10                             | 30                    | 2700                      |   |                         |
| 470               | X/7343-43              | T520X477M006A(1)E010 | 296                  | 10                             | 10                    | 5000                      |   |                         |
| 470               | X/7343-43              | T520X477M006A(1)E018 | 296                  | 10                             | 18                    | 3700                      |   |                         |
| 470               | X/7343-43              | T520X477M006A(1)E035 | 296                  | 10                             | 35                    | 2700                      |   |                         |
| 470               | X/7343-43              | T520X477M006A(1)E040 | 296                  | 10                             | 40                    | 2500                      |   |                         |

\*100kHz to 500kHz, 45° C

(1) To complete KEMET part number, insert letter designation for lead material from page 50. Higher voltage ratings and tighter tolerance product may be substituted with the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage rating.

### T520 RATINGS & PART NUMBER REFERENCE

| Rated Voltage (V) | Rated Capacitance (µF) | Case Code/ Case Size | KEMET Part Number    | DC Leakage µA @ 20°C max/ 5min | DF% @ 20°C 120 Hz Max | ESR mΩ @ 20°C 100 kHz Max | Maximum allowable ripple current (mA rms) 100kHz* | MSL Reflow Temp ≤ 260°C |
|-------------------|------------------------|----------------------|----------------------|--------------------------------|-----------------------|---------------------------|---|-------------------------|
| 8                 | 33                     | T/3528-12            | T520T336M008A(1)E070 | 26                             | 8                     | 70                        | 1200  | 3                       |
|                   | 33                     | T/3528-12            | T520T336M008A(1)E080 | 26                             | 8                     | 80                        | 1100  |                         |
|                   | 33                     | B/3528-20            | T520B336M008A(1)E025 | 26                             | 8                     | 25                        | 2300  |                         |
|                   | 33                     | B/3528-20            | T520B336M008A(1)E035 | 26                             | 15                    | 35                        | 1900  |                         |
|                   | 33                     | B/3528-20            | T520B336M008A(1)E040 | 26                             | 8                     | 40                        | 1800  |                         |
|                   | 33                     | B/3528-20            | T520B336M008A(1)E070 | 26                             | 8                     | 70                        | 1300  |                         |
|                   | 33                     | U/6032-15            | T520U336M008A(1)E070 | 26                             | 8                     | 70                        | 1400  |                         |
|                   | 47                     | B/3528-20            | T520B476M008A(1)E035 | 38                             | 8                     | 35                        | 1900  |                         |
|                   | 47                     | B/3528-20            | T520B476M008A(1)E070 | 38                             | 8                     | 70                        | 1300  |                         |
|                   | 82                     | C/6032-28            | T520C826M008A(1)E025 | 82                             | 8                     | 66                        | 1600  |                         |
|                   | 82                     | C/6032-28            | T520C826M008A(1)E045 | 82                             | 8                     | 66                        | 1600  |                         |
|                   | 150                    | D/7343-31            | T520D157M008A(1)E025 | 120                            | 10                    | 25                        | 3000  |                         |
|                   | 150                    | D/7343-31            | T520D157M008A(1)E040 | 120                            | 10                    | 40                        | 2400  |                         |
|                   | 150                    | D/7343-31            | T520D157M008A(1)E055 | 120                            | 10                    | 55                        | 2000  |                         |
|                   | 150                    | V/7343-19            | T520V157M008A(1)E040 | 120                            | 10                    | 40                        | 2200  |                         |
| 10                | 10                     | A/3216-18            | T520A106M010A(1)E080 | 10                             | 8                     | 80                        | 1200  | 3                       |
|                   | 15                     | A/3216-18            | T520A156M010A(1)E080 | 15                             | 8                     | 80                        | 1200  |                         |
|                   | 22                     | A/3216-18            | T520A226M010A(1)E080 | 22                             | 8                     | 80                        | 1200  |                         |
|                   | 33                     | T/3528-12            | T520T336M010A(1)E070 | 33                             | 8                     | 70                        | 1200  |                         |
|                   | 33                     | T/3528-12            | T520T336M010A(1)E080 | 33                             | 8                     | 80                        | 1100  |                         |
|                   | 33                     | B/3528-20            | T520B336M010A(1)E025 | 33                             | 10                    | 25                        | 2300  |                         |
|                   | 33                     | B/3528-20            | T520B336M010A(1)E035 | 33                             | 8                     | 35                        | 1900  |                         |
|                   | 33                     | B/3528-20            | T520B336M010A(1)E040 | 33                             | 8                     | 40                        | 1800  |                         |
|                   | 33                     | B/3528-20            | T520B336M010A(1)E070 | 33                             | 8                     | 70                        | 1300  |                         |
|                   | 33                     | U/6032-15            | T520U336M010A(1)E070 | 33                             | 8                     | 70                        | 1400  |                         |
|                   | 47                     | B/3528-20            | T520B476M010A(1)E035 | 47                             | 8                     | 35                        | 1900  |                         |
|                   | 47                     | B/3528-20            | T520B476M010A(1)E070 | 47                             | 8                     | 70                        | 1300  |                         |
|                   | 47                     | U/6032-15            | T520U476M010A(1)E055 | 47                             | 8                     | 55                        | 1600  |                         |
|                   | 68                     | U/6032-15            | T520U686M010A(1)E055 | 68                             | 8                     | 55                        | 1600  |                         |
|                   | 68                     | W/7343-15            | T520W686M010A(1)E025 | 68                             | 10                    | 25                        | 2200  |                         |
|                   | 68                     | W/7343-15            | T520W686M010A(1)E040 | 68                             | 10                    | 40                        | 1700  |                         |
|                   | 68                     | C/6032-28            | T520C686M010A(1)E045 | 68                             | 8                     | 45                        | 1900  |                         |
|                   | 68                     | V/7343-19            | T520V686M010A(1)E025 | 68                             | 10                    | 25                        | 2700  |                         |
|                   | 68                     | V/7343-19            | T520V686M010A(1)E040 | 68                             | 10                    | 40                        | 2200  |                         |
|                   | 68                     | V/7343-19            | T520V686M010A(1)E045 | 68                             | 10                    | 45                        | 2000  |                         |
|                   | 68                     | V/7343-19            | T520V686M010A(1)E060 | 68                             | 10                    | 60                        | 1800  |                         |
|                   | 68                     | V/7343-19            | T520V686M010A(1)E100 | 68                             | 10                    | 100                       | 1400  |                         |
|                   | 68                     | D/7343-31            | T520D686M010A(1)E100 | 68                             | 10                    | 100                       | 1500  |                         |
|                   | 100                    | C/6032-28            | T520C107M010A(1)E025 | 100                            | 8                     | 25                        | 2600  |                         |
|                   | 100                    | C/6032-28            | T520C107M010A(1)E045 | 100                            | 8                     | 45                        | 1900  |                         |
|                   | 100                    | L/6032-20            | T520L107M010A(1)E025 | 100                            | 10                    | 25                        | 2400  |                         |
|                   | 100                    | W/7343-15            | T520W107M010A(1)E040 | 100                            | 10                    | 40                        | 1700  |                         |
|                   | 100                    | V/7343-19            | T520V107M010A(1)E018 | 100                            | 10                    | 18                        | 3200  |                         |
|                   | 100                    | V/7343-19            | T520V107M010A(1)E025 | 100                            | 10                    | 25                        | 2700  |                         |
|                   | 100                    | V/7343-19            | T520V107M010A(1)E045 | 100                            | 10                    | 45                        | 2000  |                         |
|                   | 100                    | V/7343-19            | T520V107M010A(1)E050 | 100                            | 10                    | 50                        | 1900  |                         |
|                   | 100                    | D/7343-31            | T520D107M010A(1)E018 | 100                            | 10                    | 18                        | 3500  |                         |
|                   | 100                    | D/7343-31            | T520D107M010A(1)E055 | 100                            | 10                    | 55                        | 2000  |                         |
|                   | 100                    | D/7343-31            | T520D107M010A(1)E080 | 100                            | 10                    | 80                        | 1700  |                         |
|                   | 150                    | D/7343-31            | T520D157M010A(1)E025 | 150                            | 10                    | 25                        | 3000  |                         |
| 150               | D/7343-31              | T520D157M010A(1)E040 | 150                  | 10                             | 40                    | 2400                      |   |                         |
| 150               | D/7343-31              | T520D157M010A(1)E055 | 150                  | 10                             | 55                    | 2000                      |   |                         |
| 220               | Y/7343-40              | T520Y227M010A(1)E040 | 220                  | 10                             | 40                    | 2500                      |   |                         |
| 220               | D/7343-31              | T520D227M010A(1)E018 | 220                  | 10                             | 18                    | 3500                      |   |                         |
| 220               | D/7343-31              | T520D227M010A(1)E025 | 220                  | 10                             | 25                    | 3000                      |   |                         |
| 220               | D/7343-31              | T520D227M010A(1)E040 | 220                  | 10                             | 40                    | 2400                      |   |                         |
| 330               | Y/7343-40              | T520Y337M010A(1)E015 | 330                  | 10                             | 15                    | 4000                      |   |                         |
| 330               | Y/7343-40              | T520Y337M010A(1)E035 | 330                  | 10                             | 35                    | 2600                      |   |                         |
| 330               | X/7343-43              | T520X337M010A(1)E010 | 330                  | 10                             | 10                    | 5000                      |   |                         |
| 330               | X/7343-43              | T520X337M010A(1)E025 | 330                  | 10                             | 25                    | 3100                      |   |                         |
| 330               | X/7343-43              | T520X337M010A(1)E040 | 330                  | 10                             | 40                    | 2500                      |   |                         |
| 12.5              | 10                     | T/3528-12            | T520T106M12RA(1)E080 | 13                             | 8                     | 80                        | 1100  | 3                       |
|                   | 15                     | T/3528-12            | T520T156M12RA(1)E080 | 19                             | 8                     | 80                        | 1100  |                         |
|                   | 22                     | C/6032-28            | T520C226M016A(1)E080 | 35                             | 8                     | 80                        | 1400  |                         |
| 16                | 33                     | W/7343-15            | T520W336M016A(1)E045 | 53                             | 10                    | 60                        | 1400  | 3                       |
|                   | 33                     | V/7343-19            | T520V336M016A(1)E045 | 53                             | 10                    | 45                        | 2000  |                         |
|                   | 33                     | V/7343-19            | T520V336M016A(1)E060 | 53                             | 10                    | 60                        | 1800  |                         |
|                   | 33                     | V/7343-19            | T520V336M016A(1)E070 | 53                             | 10                    | 70                        | 1600  |                         |
|                   | 47                     | W/7343-15            | T520W476M016A(1)E045 | 75                             | 10                    | 45                        | 1600  |                         |
|                   | 47                     | V/7343-19            | T520V476M016A(1)E045 | 75                             | 10                    | 45                        | 2000  |                         |
|                   | 47                     | V/7343-19            | T520V476M016A(1)E070 | 76                             | 10                    | 70                        | 1600  |                         |
|                   | 47                     | D/7343-31            | T520D476M016A(1)E035 | 75                             | 10                    | 35                        | 2500  |                         |
|                   | 47                     | D/7343-31            | T520D476M016A(1)E070 | 75                             | 10                    | 70                        | 1800  |                         |
|                   | 68                     | D/7343-31            | T520D686M016A(1)E050 | 109                            | 10                    | 50                        | 2100  |                         |
| 150               | X/7343-43              | T520X157M016A(1)E040 | 240                  | 10                             | 40                    | 2500                      |   |                         |
| 20                | 22                     | V/7343-19            | T520V226M020A(1)E040 | 44                             | 10                    | 40                        | 2200  | 3                       |
|                   | 22                     | V/7343-19            | T520V226M020A(1)E045 | 44                             | 10                    | 45                        | 2000  |                         |
|                   | 22                     | V/7343-19            | T520V226M020A(1)E090 | 44                             | 10                    | 90                        | 1400  |                         |
| 25                | 15                     | D/7343-31            | T520D156M025A(1)E060 | 38                             | 10                    | 60                        | 1900  | 3                       |
|                   | 15                     | D/7343-31            | T520D156M025A(1)E080 | 38                             | 10                    | 80                        | 1700  |                         |

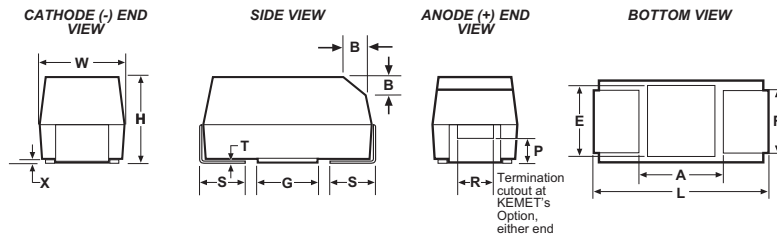
\*100kHz to 500kHz, 45° C

Conductive Polymer Surface Mount

**FEATURES**

- Polymer Cathode Technology
- 125°C Maximum Temperature Capability
- High Frequency Capacitance Retention
- Non-Ignition Failure Mode
- Capacitance: 33 - 680µF
- Voltage: 2.5 to 16 volts
- Use up to 90% of Rated Voltage (10% Derating) for part types ≤ 10 Volts
- Use up to 80% of Rated Voltage (20% Derating) for part types >10 Volts
- Operating Temperature -55°C to +125°C
- 100% Accelerated Steady State Aging
- 100% Surge Current Testing
- Self-Healing Mechanism
- Volumetrically Efficient
- Extremely Stable ESR at 125°C
- EIA Standard Case Size
- RoHS Compliant / Leadfree Termination (See www.kemet.com for lead transition)

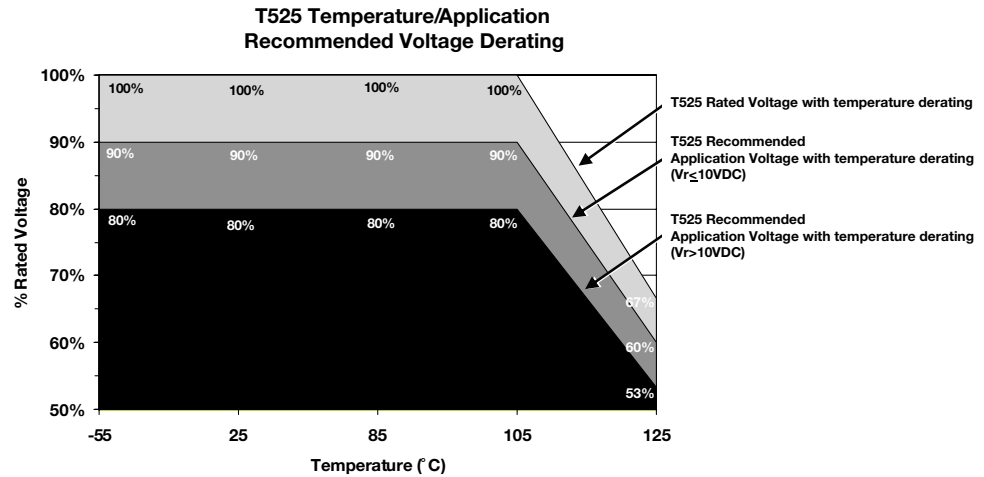
**OUTLINE DRAWING**



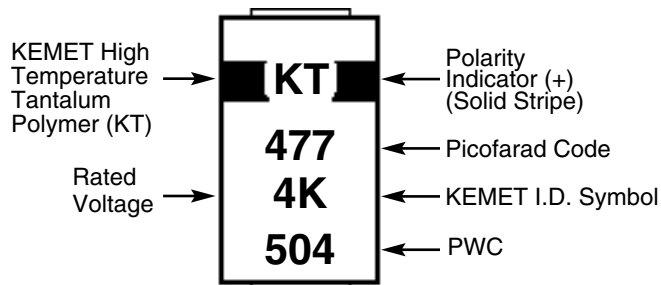
**DIMENSIONS - MILLIMETERS**

| Case Size |         | L         | W         | H         | F ±0.1 | S ±0.3 | X (Ref)     | T (Ref) | A (Min) | G (Ref) | E (Ref) |
|-----------|---------|-----------|-----------|-----------|--------|--------|-------------|---------|---------|---------|---------|
| KEMET     | EIA     |           |           |           |        |        |             |         |         |         |         |
| T         | 3528-12 | 3.5 ± 0.2 | 2.8 ± 0.2 | 1.2 max.  | 2.2    | 0.8    | 0.05        | 0.13    | 1.1     | 1.8     | 2.2     |
| B         | 3528-21 | 3.5 ± 0.2 | 2.8 ± 0.2 | 1.9 ± 0.1 | 2.2    | 0.8    | 0.10 ± 0.10 | 0.13    | 1.1     | 1.8     | 2.2     |
| D         | 7343-31 | 7.3 ± 0.3 | 4.3 ± 0.3 | 2.8 ± 0.3 | 2.4    | 1.3    | 0.10 ± 0.10 | 0.13    | 3.8     | 3.5     | 3.5     |

**RECOMMENDED TEMPERATURE/VOLTAGE DERATING**



**COMPONENT MARKING**



504=4th week of 2005

### T525 RATINGS & PART NUMBER REFERENCE

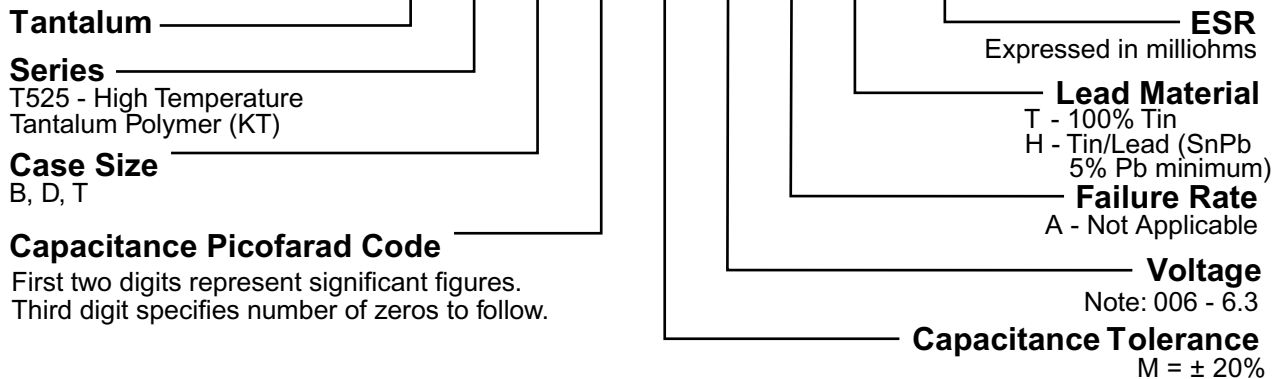
| Rated Voltage (V) | Rated Capacitance (µF) | Case Code/ Case Size | KEMET Part Number    | DC Leakage µA @ 20°C max/5min | DF% @ 20°C 120 Hz Max | ESR mΩ @ 20°C 100 kHz Max | Maximum allowable ripple current (mA rms) 100kHz* | MSL Reflow Temp ≤ 260°C |
|-------------------|------------------------|----------------------|----------------------|-------------------------------|-----------------------|---------------------------|---|-------------------------|
| 2.5               | 100                    | T/3528-12            | T525T107M2R5A(1)E080 | 25                            | 8.0                   | 80                        | 1100  | 3                       |
|                   | 330                    | D/7343-31            | T525D337M2R5A(1)E025 | 83                            | 10.0                  | 25                        | 3000  |                         |
|                   | 470                    | D/7343-31            | T525D477M2R5A(1)E025 | 118                           | 10.0                  | 25                        | 3000  |                         |
|                   | 680                    | D/7343-31            | T525D687M2R5A(1)E025 | 170                           | 10.0                  | 25                        | 3000  |                         |
| 3                 | 100                    | B/3528-20            | T525B107M003A(1)E080 | 30                            | 8.0                   | 80                        | 1300  | 3                       |
|                   | 150                    | B/3528-20            | T525B157M003A(1)E080 | 45                            | 8.0                   | 80                        | 1300  |                         |
|                   | 330                    | D/7343-31            | T525D337M003A(1)E025 | 99                            | 10.0                  | 25                        | 3000  |                         |
|                   | 470                    | D/7343-31            | T525D477M003A(1)E025 | 141                           | 10.0                  | 25                        | 3000  |                         |
|                   | 680                    | D/7343-31            | T525D687M003A(1)E025 | 204                           | 10.0                  | 25                        | 3000  |                         |
| 4                 | 68                     | T/3528-12            | T525T686M004A(1)E080 | 27                            | 8.0                   | 80                        | 1100  | 3                       |
|                   | 68                     | B/3528-20            | T525B686M004A(1)E080 | 28                            | 8.0                   | 80                        | 1300  |                         |
|                   | 100                    | B/3528-20            | T525B107M004A(1)E080 | 40                            | 8.0                   | 80                        | 1300  |                         |
|                   | 220                    | D/7343-31            | T525D227M004A(1)E025 | 88                            | 10.0                  | 25                        | 3000  |                         |
|                   | 330                    | D/7343-31            | T525D337M004A(1)E025 | 132                           | 10.0                  | 25                        | 3000  |                         |
|                   | 470                    | D/7343-31            | T525D477M004A(1)E025 | 188                           | 10.0                  | 25                        | 3000  |                         |
|                   | 470                    | D/7343-31            | T525D477M004A(1)E040 | 188                           | 10.0                  | 40                        | 2400  |                         |
| 6.3               | 33                     | B/3528-20            | T525B336M006A(1)E080 | 21                            | 8.0                   | 80                        | 1300  | 3                       |
|                   | 47                     | T/3528-12            | T525T476M006A(1)E080 | 30                            | 8.0                   | 80                        | 1100  |                         |
|                   | 47                     | B/3528-20            | T525B476M006A(1)E080 | 30                            | 8.0                   | 80                        | 1300  |                         |
|                   | 68                     | B/3528-20            | T525B686M006A(1)E080 | 43                            | 8.0                   | 80                        | 1300  |                         |
|                   | 150                    | D/7343-31            | T525D157M006A(1)E025 | 95                            | 10.0                  | 25                        | 3000  |                         |
|                   | 220                    | D/7343-31            | T525D227M006A(1)E025 | 139                           | 10.0                  | 25                        | 3000  |                         |
|                   | 330                    | D/7343-31            | T525D337M006A(1)E025 | 208                           | 10.0                  | 25                        | 3000  |                         |
|                   | 330                    | D/7343-31            | T525D337M006A(1)E040 | 208                           | 10.0                  | 40                        | 2400  |                         |
| 8                 | 33                     | T/3528-12            | T525T336M008A(1)E080 | 26                            | 8.0                   | 80                        | 1100  | 3                       |
| 10                | 22                     | B/3528-20            | T525B226M010A(1)E080 | 22                            | 8.0                   | 80                        | 1300  | 3                       |
|                   | 33                     | T/3528-12            | T525T336M010A(1)E080 | 33                            | 8.0                   | 80                        | 1100  |                         |
|                   | 33                     | B/3528-20            | T525B336M010A(1)E080 | 33                            | 8.0                   | 80                        | 1300  |                         |
|                   | 100                    | D/7343-31            | T525D107M010A(1)E025 | 100                           | 10.0                  | 25                        | 3000  |                         |
|                   | 100                    | D/7343-31            | T525D107M010A(1)E055 | 100                           | 10.0                  | 55                        | 2000  |                         |
|                   | 150                    | D/7343-31            | T525D157M010A(1)E025 | 150                           | 10.0                  | 25                        | 3000  |                         |
|                   | 150                    | D/7343-31            | T525D157M010A(1)E055 | 150                           | 10.0                  | 55                        | 2000  |                         |
|                   | 220                    | D/7343-31            | T525D227M010A(1)E025 | 220                           | 10.0                  | 25                        | 3000  |                         |
| 16                | 47                     | D/7343-31            | T525D476M016A(1)E035 | 76                            | 10.0                  | 35                        | 2500  | 3                       |
|                   | 47                     | D/7343-31            | T525D476M016A(1)E065 | 76                            | 10.0                  | 65                        | 1900  |                         |

\*100kHz to 500kHz, 45° C

(1) To complete KEMET Part Number, insert lead material designation for ordering information below. Higher voltage ratings and tighter tolerance product may be substituted within the same size at KEMET'S option. Voltage substitutions will be marked with the higher voltage rating.

### T525 ORDERING INFORMATION

**T 525 D 337 M 006 A T E040**



Conductive Polymer Surface Mount

# KEMET CONDUCTIVE POLYMER CHIP CAPACITORS

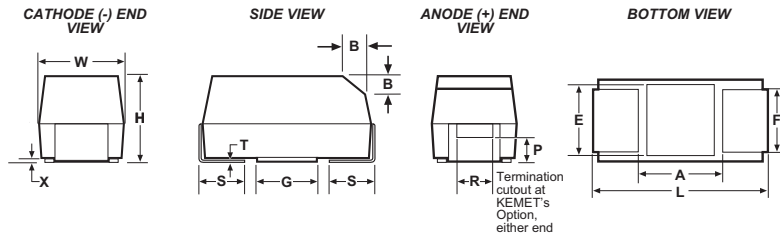
CHARGED™

## T530 SERIES - High Capacitance/Ultra-Low ESR

### FEATURES

- Highest CV in Standard EIA Size
- Extremely Low ESR
- Operating Temperature: -55°C to 125°C
- Polymer Cathode Technology
- High Frequency Capacitance Retention
- Non-Ignition Failure Mode
- Capacitance: 150 to 1500  $\mu$ F
- Voltage: 2.5V to 10V
- Molded Case (pick-and-place precision)
- 100% Accelerated Steady State Aging
- 100% Surge Current Testing
- Utilizes Multiple Tantalum Anode Technology
- Volumetric Efficiency
- Use Up to 90% of Rated Voltage (10% Derating)
- Self-Healing Mechanism
- True SMT Capability
- RoHS Compliant/Lead Free

### OUTLINE DRAWINGS



### DIMENSIONS - MILLIMETERS (INCHES)

| Case Size |         | L             | W             | H             | F $\pm$ 0.1 | S $\pm$ 0.3 | X (Ref)         | T (Ref) | A (Min) | G (Ref) | E (Ref) |
|-----------|---------|---------------|---------------|---------------|-------------|-------------|-----------------|---------|---------|---------|---------|
| KEMET     | EIA     |               |               |               |             |             |                 |         |         |         |         |
| D         | 7343-31 | 7.3 $\pm$ 0.3 | 4.3 $\pm$ 0.3 | 2.8 $\pm$ 0.3 | 2.4         | 1.3         | 0.10 $\pm$ 0.10 | 0.13    | 3.8     | 3.5     | 3.5     |
| Y         | 7343-40 | 7.3 $\pm$ 0.3 | 4.3 $\pm$ 0.3 | 4.0 max       | 2.4         | 1.3         | 0.10 $\pm$ 0.10 | 0.13    | 3.8     | 3.5     | 3.5     |
| X         | 7373-43 | 7.3 $\pm$ 0.3 | 4.3 $\pm$ 0.3 | 4.0 $\pm$ 0.3 | 2.4         | 1.3         | 0.10 $\pm$ 0.10 | 0.13    | 3.8     | 3.5     | 3.5     |

### T530 RATINGS & PART NUMBER REFERENCE

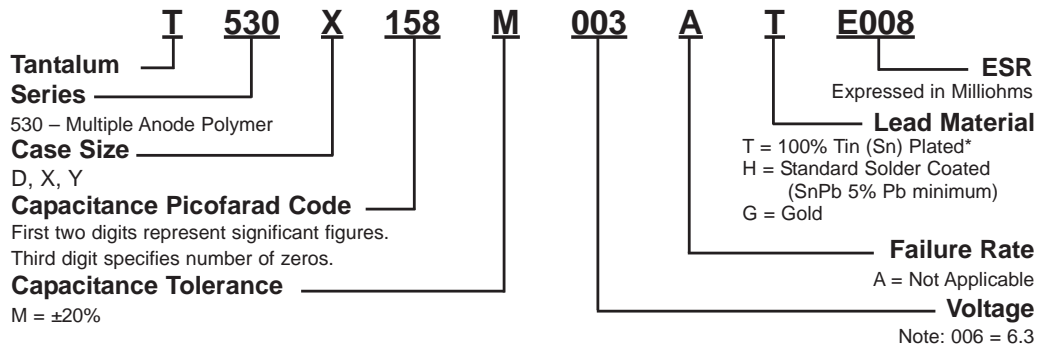
| Rated Voltage (V) | Rated Capacitance ( $\mu$ F) | Case Code/ Case Size | KEMET Part Number    | DC Leakage $\mu$ A @ 20°C max/ 5min | DF% @ 20°C 120 Hz Max | ESR m $\Omega$ @ 20°C 100 kHz Max | Maximum allowable ripple current (mA <sub>RMS</sub> ) 100kHz* | MSL Reflow Temp $\leq$ 260°C |
|-------------------|------------------------------|----------------------|----------------------|-------------------------------------|-----------------------|-----------------------------------|---|------------------------------|
| 2.5               | 470                          | D/7343-31            | T530D477M2R5A(1)E005 | 118                                 | 8.0                   | 5.0                               | 7100  | 3                            |
|                   | 470                          | D/7343-31            | T530D477M2R5A(1)E006 | 118                                 | 8.0                   | 6.0                               | 6500  |                              |
|                   | 470                          | D/7343-31            | T530D477M2R5A(1)E010 | 118                                 | 10.0                  | 10.0                              | 5000  |                              |
|                   | 560                          | D/7343-31            | T530D567M2R5A(1)E005 | 140                                 | 8.0                   | 5.0                               | 7100  |                              |
|                   | 680                          | Y/7343-40            | T530Y687M2R5A(1)E005 | 170                                 | 8.0                   | 5.0                               | 7300  |                              |
|                   | 680                          | Y/7343-40            | T530Y687M2R5A(1)E006 | 170                                 | 8.0                   | 6.0                               | 6600  |                              |
|                   | 680                          | D/7343-31            | T530D687M2R5A(1)E006 | 170                                 | 8.0                   | 6.0                               | 6500  |                              |
|                   | 680                          | D/7343-31            | T530D687M2R5A(1)E010 | 170                                 | 8.0                   | 10.0                              | 5000  |                              |
|                   | 680                          | X/7343-43            | T530X687M2R5A(1)E006 | 170                                 | 8.0                   | 6.0                               | 6700  |                              |
|                   | 1000                         | Y/7343-40            | T530Y108M2R5A(1)E005 | 250                                 | 8.0                   | 5.0                               | 7300  |                              |
|                   | 1000                         | Y/7343-40            | T530Y108M2R5A(1)E006 | 250                                 | 8.0                   | 6.0                               | 6600  |                              |
|                   | 1000                         | X/7343-43            | T530X108M2R5A(1)E004 | 250                                 | 8.0                   | 4.0                               | 8200  |                              |
|                   | 1000                         | X/7343-43            | T530X108M2R5A(1)E005 | 250                                 | 8.0                   | 5.0                               | 7300  |                              |
|                   | 1000                         | X/7343-43            | T530X108M2R5A(1)E006 | 250                                 | 8.0                   | 6.0                               | 6700  |                              |
|                   | 1500                         | X/7343-43            | T530X158M2R5A(1)E005 | 375                                 | 8.0                   | 5.0                               | 7300  |                              |
| 3                 | 470                          | D/7343-31            | T530D477M003A(1)E010 | 141                                 | 8.0                   | 10.0                              | 5000  | 3                            |
|                   | 680                          | D/7343-31            | T530D687M003A(1)E010 | 204                                 | 8.0                   | 10.0                              | 5000  |                              |
|                   | 1000                         | X/7343-43            | T530X108M003A(1)E010 | 300                                 | 8.0                   | 10.0                              | 5200  |                              |
|                   | 1500                         | X/7343-43            | T530X158M003A(1)E008 | 450                                 | 8.0                   | 8.0                               | 5800  |                              |
|                   | 1500                         | X/7343-43            | T530X158M003A(1)E010 | 450                                 | 8.0                   | 10.0                              | 5200  |                              |
| 4                 | 330                          | D/7343-31            | T530D337M004A(1)E005 | 132                                 | 8.0                   | 5.0                               | 7100  | 3                            |
|                   | 330                          | D/7343-31            | T530D337M004A(1)E006 | 132                                 | 8.0                   | 6.0                               | 6500  |                              |
|                   | 470                          | D/7343-31            | T530D477M004A(1)E006 | 188                                 | 8.0                   | 6.0                               | 6500  |                              |
|                   | 470                          | D/7343-31            | T530D477M004A(1)E010 | 188                                 | 8.0                   | 10.0                              | 5000  |                              |
|                   | 470                          | Y/7343-40            | T530Y477M004A(1)E005 | 188                                 | 8.0                   | 5.0                               | 7300  |                              |
|                   | 470                          | Y/7343-40            | T530Y477M004A(1)E006 | 188                                 | 8.0                   | 6.0                               | 6800  |                              |
|                   | 680                          | Y/7343-40            | T530Y687M004A(1)E005 | 272                                 | 8.0                   | 5.0                               | 7300  |                              |
|                   | 680                          | X/7343-43            | T530X687M004A(1)E004 | 272                                 | 8.0                   | 4.0                               | 8200  |                              |
|                   | 680                          | X/7343-43            | T530X687M004A(1)E005 | 272                                 | 8.0                   | 5.0                               | 7300  |                              |
|                   | 680                          | X/7343-43            | T530X687M004A(1)E006 | 272                                 | 8.0                   | 6.0                               | 6700  |                              |
|                   | 680                          | X/7343-43            | T530X687M004A(1)E010 | 272                                 | 8.0                   | 10.0                              | 5200  |                              |
|                   | 1000                         | X/7343-43            | T530X108M004A(1)E006 | 400                                 | 8.0                   | 6.0                               | 6700  |                              |

| Rated Voltage (V) | Rated Capacitance ( $\mu$ F) | Case Code/ Case Size | KEMET Part Number    | DC Leakage $\mu$ A @ 20°C max/ 5min | DF% @ 20°C 120 Hz Max | ESR m $\Omega$ @ 20°C 100 kHz Max | Maximum allowable ripple current (mA <sub>RMS</sub> ) 100kHz* | MSL Reflow Temp $\leq$ 260°C |
|-------------------|------------------------------|----------------------|----------------------|-------------------------------------|-----------------------|-----------------------------------|---|------------------------------|
| 6.3               | 220                          | D/7343-31            | T530D227M006A(1)E005 | 139                                 | 8.0                   | 5.0                               | 7100  | 3                            |
|                   | 220                          | D/7343-31            | T530D227M006A(1)E006 | 139                                 | 8.0                   | 6.0                               | 6500  |                              |
|                   | 330                          | D/7343-31            | T530D337M006A(1)E006 | 208                                 | 8.0                   | 6.0                               | 6500  |                              |
|                   | 330                          | D/7343-31            | T530D337M006A(1)E010 | 208                                 | 8.0                   | 10.0                              | 5000  |                              |
|                   | 330                          | Y/7343-40            | T530Y337M006A(1)E005 | 208                                 | 8.0                   | 5.0                               | 7300  |                              |
|                   | 330                          | Y/7343-40            | T530Y337M006A(1)E006 | 208                                 | 8.0                   | 6.0                               | 6600  |                              |
|                   | 330                          | Y/7343-40            | T530Y337M006A(1)E010 | 208                                 | 8.0                   | 10.0                              | 5100  |                              |
|                   | 470                          | Y/7343-40            | T530Y477M006A(1)E005 | 296                                 | 8.0                   | 5.0                               | 7300  |                              |
|                   | 470                          | X/7343-43            | T530X477M006A(1)E004 | 296                                 | 8.0                   | 4.0                               | 8200  |                              |
|                   | 470                          | X/7343-43            | T530X477M006A(1)E005 | 296                                 | 8.0                   | 5.0                               | 7300  |                              |
|                   | 470                          | X/7343-43            | T530X477M006A(1)E006 | 296                                 | 8.0                   | 6.0                               | 6700  |                              |
|                   | 470                          | X/7343-43            | T530X477M006A(1)E010 | 296                                 | 8.0                   | 10.0                              | 5200  |                              |
|                   | 680                          | X/7343-43            | T530X687M006A(1)E010 | 428                                 | 8.0                   | 10.0                              | 5200  |                              |
|                   | 680                          | X/7343-43            | T530X687M006A(1)E018 | 428                                 | 8.0                   | 18.0                              | 3900  |                              |
|                   | 150                          | D/7343-31            | T530D157M010A(1)E005 | 150                                 | 8.0                   | 5.0                               | 7100  |                              |
| 150               | D/7343-31                    | T530D157M010A(1)E006 | 150                  | 8.0                                 | 6.0                   | 6500                              |   |                              |
| 150               | D/7343-31                    | T530D157M010A(1)E010 | 150                  | 8.0                                 | 10.0                  | 5000                              |   |                              |
| 220               | D/7343-31                    | T530D227M010A(1)E006 | 220                  | 8.0                                 | 6.0                   | 6500                              |   |                              |
| 220               | D/7343-31                    | T530D227M010A(1)E010 | 220                  | 8.0                                 | 10.0                  | 5000                              |   |                              |
| 220               | Y/7343-40                    | T530Y227M010A(1)E006 | 220                  | 8.0                                 | 6.0                   | 6600                              |   |                              |
| 330               | X/7343-43                    | T530X337M010A(1)E004 | 330                  | 8.0                                 | 4.0                   | 8200                              |   |                              |
| 330               | X/7343-43                    | T530X337M010A(1)E005 | 330                  | 8.0                                 | 5.0                   | 7300                              |   |                              |
| 330               | X/7343-43                    | T530X337M010A(1)E006 | 330                  | 8.0                                 | 6.0                   | 6700                              |   |                              |
| 330               | X/7343-43                    | T530X337M010A(1)E010 | 330                  | 8.0                                 | 10.0                  | 5200                              |   |                              |
| 150               | X/7343-43                    | T530X157M016A(1)E015 | 240                  | 8.0                                 | 15.0                  | 4200                              | 3   |                              |
| 150               | X/7343-43                    | T530X157M016A(1)E025 | 240                  | 8.0                                 | 25.0                  | 3300                              |   |                              |
| 150               | X/7343-43                    | T530X157M016A(1)E040 | 240                  | 8.0                                 | 40.0                  | 2600                              |   |                              |

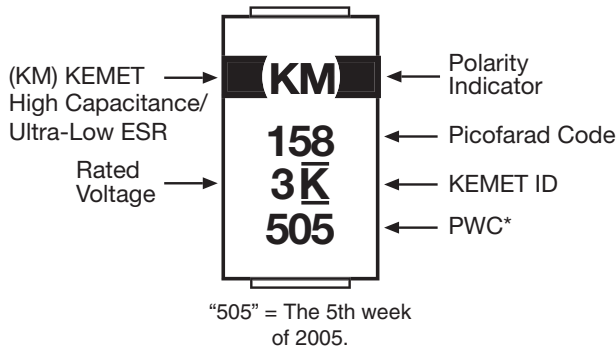
\*100kHz to 500kHz, 45°C

(1) To complete KEMET part number, insert lead material designation from ordering information on page 57. Higher voltage ratings and tighter tolerance product may be substituted within the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage ratings.

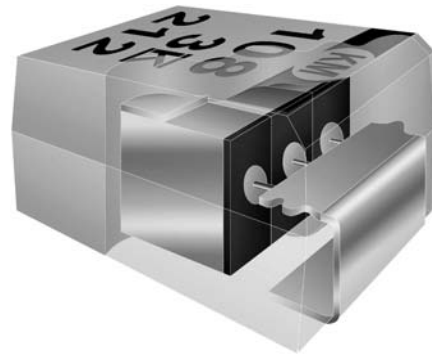
## T530 ORDERING INFORMATION



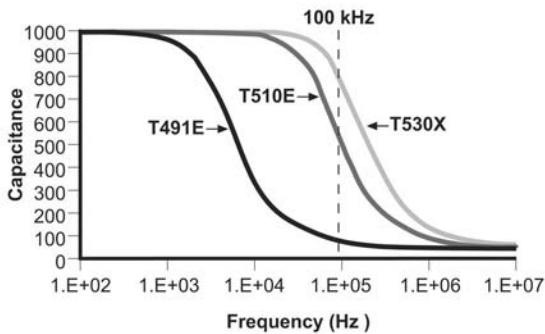
## COMPONENT MARKING



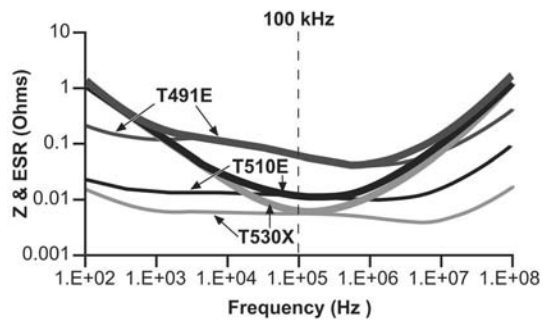
## T530 SERIES CONSTRUCTION



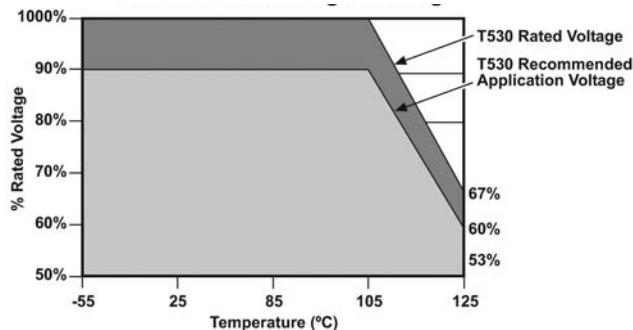
## T530X/T510E/T491E 1,000µF Capacitance vs. Frequency



## T530X/T510E/T491E 1,000µF Impedance & ESR vs. Frequency



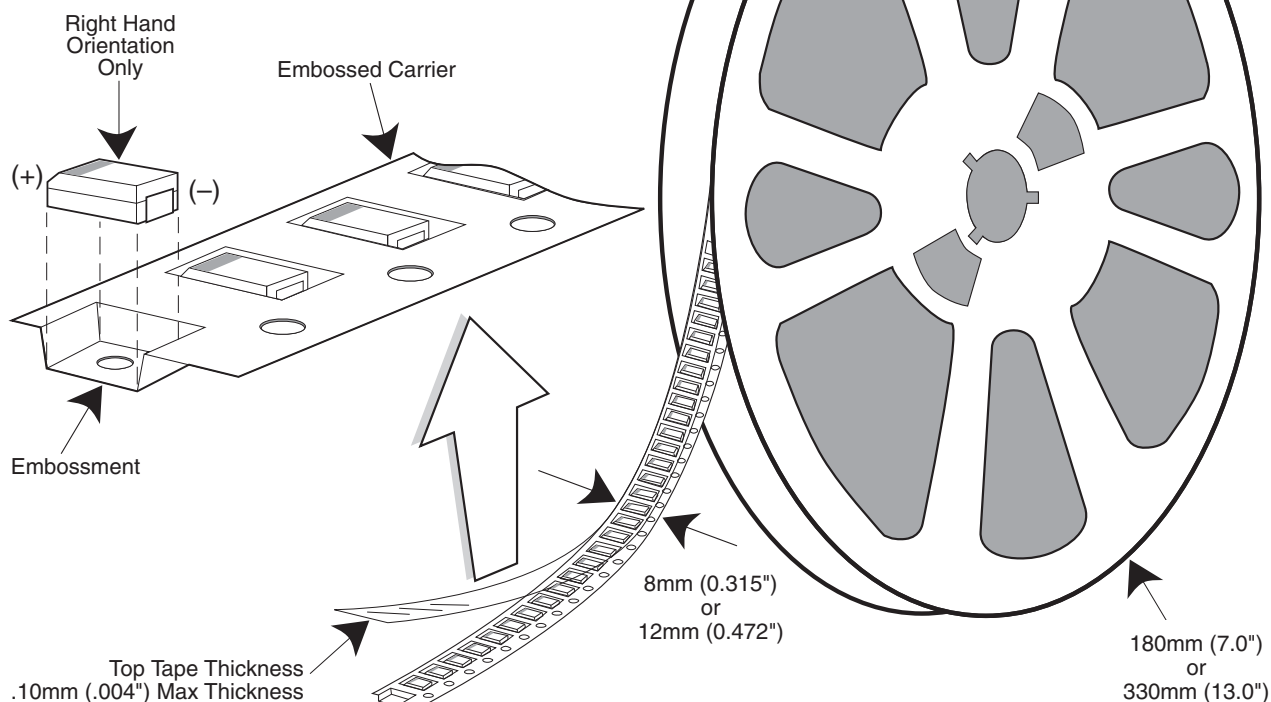
## RECOMMENDED TEMPERATURE/VOLTAGE DERATING





## Tape & Reel Packaging

KEMET's Molded Tantalum and Aluminum Chip Capacitor families are packaged in 8 mm and 12 mm plastic tape on 7" and 13" reels, in accordance with EIA Standard 481-1: Taping of Surface Mount Components for Automatic Handling. This packaging system is compatible with all tape fed automatic pick and place systems.



**Labeling:** Bar code labeling (standard or custom) shall be on the side of the reel opposite the sprocket holes. Refer to EIA-556.

### QUANTITIES PACKAGED PER REEL

| Case Code |         | Tape Width-mm | 7" Reel* | 13" Reel |
|-----------|---------|---------------|----------|----------|
| KEMET     | EIA     |               |          |          |
| R         | 2012-12 | 8             | 2,500    | 10,000   |
| I         | 3216-10 | 8             | 3,000    | 12,000   |
| S         | 3216-12 | 8             | 2,500    | 10,000   |
| T         | 3528-12 | 8             | 2,500    | 10,000   |
| M         | 3528-15 | 8             | 2,000    | 8,000    |
| U         | 6032-15 | 12            | 1,000    | 5,000    |
| L         | 6032-19 | 12            | 1,000    | 5,000    |
| W         | 7343-15 | 12            | 1,000    | 3,000    |
| Z         | 7343-17 | 12            | 1,000    | 3,000    |
| V         | 7343-20 | 12            | 1,000    | 3,000    |
| A         | 3216-18 | 8             | 2,000    | 9,000    |
| B         | 3528-21 | 8             | 2,000    | 8,000    |
| C         | 6032-28 | 12            | 500      | 3,000    |
| D         | 7343-31 | 12            | 500      | 2,500    |
| Y         | 7343-40 | 12            | 500      | 2,000    |
| X         | 7343-43 | 12            | 500      | 2,000    |
| E         | 7260-38 | 12            | 500      | 2,000    |

\* No c-spec required for 7" reel packaging. C-7280 required for 13" reel packaging.

# TANTALUM, CERAMIC AND ALUMINUM CHIP CAPACITORS

## Packaging Information

### Performance Notes

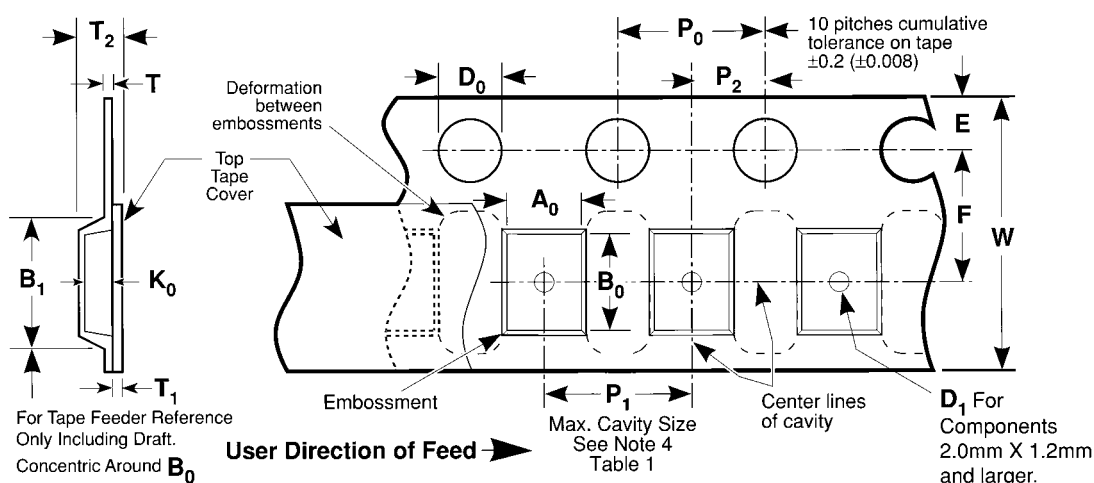
- Cover Tape Break Force:** 1.0 Kg Minimum.
- Cover Tape Peel Strength:** The total peel strength of the cover tape from the carrier tape shall be:

| Tape Width | Peel Strength                          |
|------------|--|
| 8 mm       | 0.1 Newton to 1.0 Newton (10g to 100g) |
| 12 mm      | 0.1 Newton to 1.3 Newton (10g to 130g) |

The direction of the pull shall be opposite the direction of the carrier tape travel. The pull angle of the carrier tape shall be 165° to 180° from the plane of the carrier tape. During peeling, the carrier and/or cover tape shall be pulled at a velocity of 300 ±10 mm/minute.

- Reel Sizes:** Molded tantalum capacitors are available on either 180 mm (7") reels (standard) or 330 mm (13") reels (with C-7280). Note that 13" reels are preferred.
- Labeling:** Bar code labeling (standard or custom) shall be on the side of the reel opposite the sprocket holes. Refer to EIA-556.

### Embossed Carrier Tape Configuration: Figure 1



**Table 1 — EMBOSSED TAPE DIMENSIONS (Metric will govern)**

| Constant Dimensions — Millimeters (Inches) |  |                               |                               |                             |                             |                    |                    |                              |  |
|--|--|-------------------------------|-------------------------------|-----------------------------|-----------------------------|--------------------|--------------------|------------------------------|--|
| Tape Size                                  | D <sub>0</sub>                               | E                             | P <sub>0</sub>                | P <sub>2</sub>              | T Max                       | T <sub>1</sub> Max |                    |                              |  |
| 8 mm and 12 mm                             | 1.5<br>+0.10 -0.0<br>(0.059<br>+0.004, -0.0) | 1.75 ±0.10<br>(0.069 ±0.004)  | 4.0 ±0.10<br>(0.157 ±0.004)   | 2.0 ±0.05<br>(0.079 ±0.002) | 0.600<br>(0.024)            | 0.100<br>(0.004)   |                    |                              |  |
| Variable Dimensions — Millimeters (Inches) |  |                               |                               |                             |                             |                    |                    |                              |  |
| Tape Size                                  | Pitch  | B <sub>1</sub> Max.<br>Note 1 | D <sub>1</sub> Min.<br>Note 2 | F                           | P <sub>1</sub>              | R Min.<br>Note 3   | T <sub>2</sub> Max | W                            | A <sub>0</sub> B <sub>0</sub> K <sub>0</sub><br>Note 4 |
| 8 mm                                       | Single<br>(4 mm)                             | 4.4<br>(0.173)                | 1.0<br>(0.039)                | 3.5 ±0.05<br>(0.138 ±0.002) | 4.0 ±0.10<br>(0.157 ±0.004) | 25.0<br>(0.984)    | 2.5<br>(0.098)     | 8.0 ±0.30<br>(.315 ±0.012)   |  |
| 12 mm                                      | Double<br>(8 mm)                             | 8.2<br>(0.323)                | 1.5<br>(0.059)                | 5.5 ±0.05<br>(0.217 ±0.002) | 8.0 ±0.10<br>(0.315 ±0.004) | 30.0<br>(1.181)    | 4.6<br>(0.181)     | 12.0 ±0.30<br>(0.472 ±0.012) |  |

### NOTES

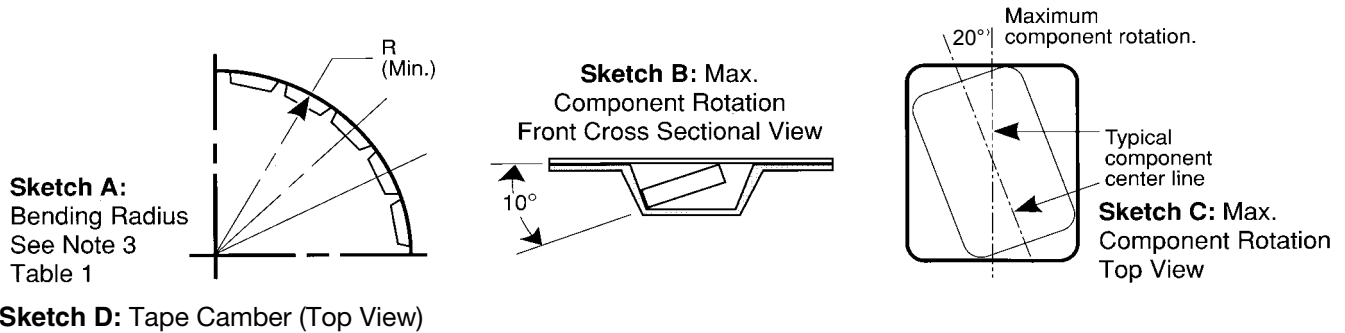
- B<sub>1</sub> dimension is a reference dimension for tape feeder clearance only.
- The embossment hole location shall be measured from the sprocket hole controlling the location of the embossment. Dimensions of embossment location and hole location shall be applied independent of each other.
- Tape with components shall pass around radius "R" without damage (see sketch A). The minimum trailer length (Fig. 2) may require additional length to provide R min. for 12 mm embossed tape for reels with hub diameters approaching N min. (Table 2)
- The cavity defined by A<sub>0</sub>, B<sub>0</sub>, and K<sub>0</sub> shall be configured to surround the part with sufficient clearance such that the chip does not protrude beyond the sealing plane of the cover tape, the chip can be removed from the cavity in a vertical direction without mechanical restriction, rotation of the chip is limited to 20 degrees maximum in all 3 planes, and lateral movement of the chip is restricted to 0.5 mm maximum in the pocket (not applicable to vertical clearance.)

# TANTALUM, CERAMIC AND ALUMINUM CHIP CAPACITORS

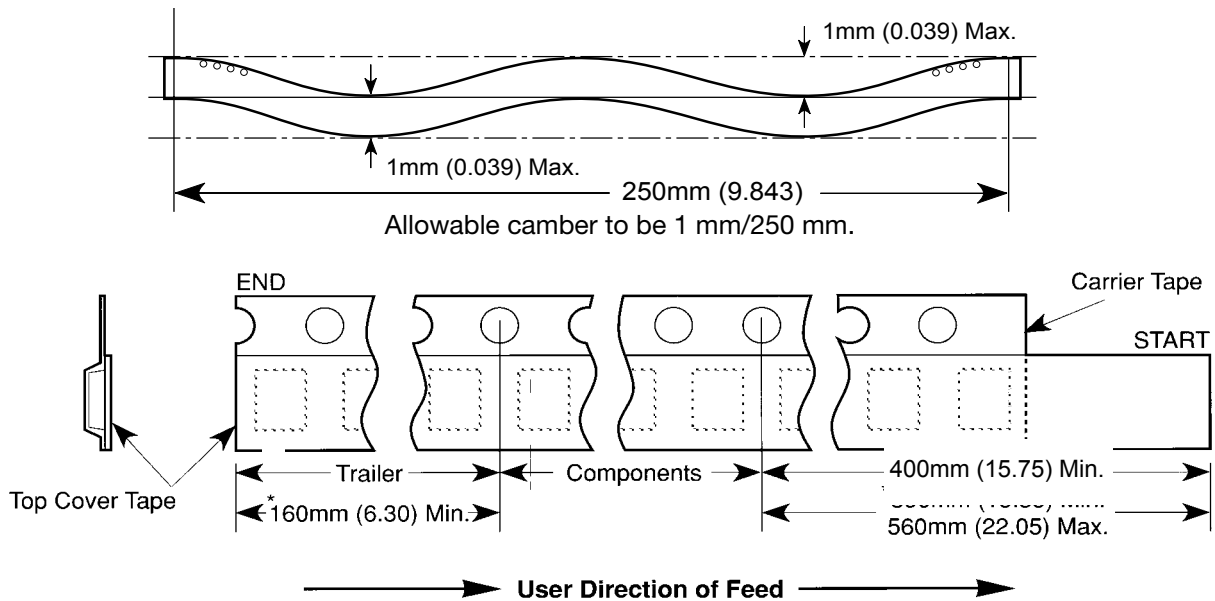


## Packaging Information

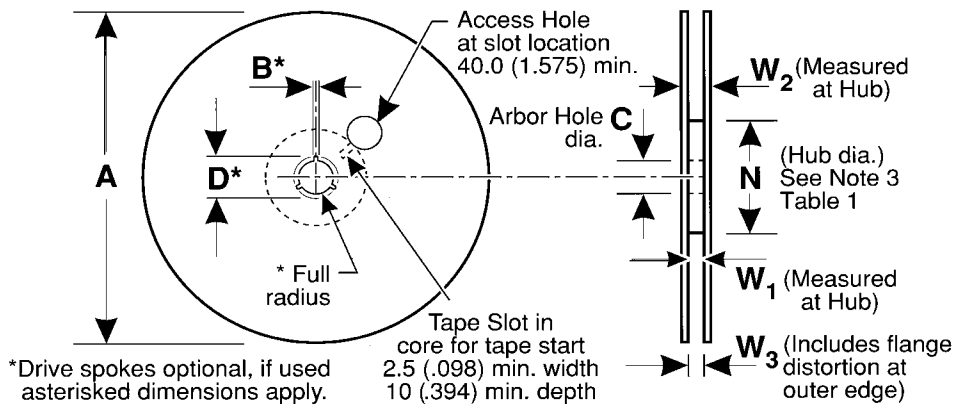
### Embossed Carrier Tape Configuration (cont.)



### Sketch D: Tape Camber (Top View)



**Figure 2:** Tape Leader & Trailer Dimensions (Metric Dimensions Will Govern)



**Figure 3:** Reel Dimensions (Metric Dimensions will govern)

**Table 2 – REEL DIMENSIONS (Metric will govern)**

| Tape Size | A Max             | $B^*$ Min      | C                              | $D^*$ Min       | N Min                                       | $W_1$   | $W_2$ Max       | $W_3$                                      |
|-----------|-------------------|----------------|--------------------------------|-----------------|---|---|-----------------|--|
| 8 mm      | 330.0<br>(12.992) | 1.5<br>(0.059) | 13.0 ± 0.20<br>(0.512 ± 0.008) | 20.2<br>(0.795) | 50.0<br>(1.969)<br>See<br>Note 3<br>Table 1 | 8.4<br>+1.5, -0.0<br>(0.331<br>+0.059, -0.0)  | 14.4<br>(0.567) | 7.9 Min<br>(0.311)<br>10.9 Max<br>(0.429)  |
| 12 mm     | 330.0<br>(12.992) | 1.5<br>(0.059) | 13.0 ± 0.20<br>(0.512 ± 0.008) | 20.2<br>(0.795) | Table 1                                     | 12.4<br>+2.0, -0.0<br>(0.488<br>+0.078, -0.0) | 18.4<br>(0.724) | 11.9 Min<br>(0.469)<br>15.4 Max<br>(0.606) |