

## Overview

The KEMET T491 Series, designed specifically for today's highly automated surface mount processes and equipment, is the leading choice for surface mount designs. The T491 combines KEMET's proven solid tantalum technology, acclaimed and respected throughout the world, with the latest in materials, processes and automation, resulting in unsurpassed total performance and value.

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 Series. 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.

The T491 standard terminations are 100% matte tin and provide excellent wetting characteristics and compatibility with today's surface mount solder systems. Tin/lead (Sn/Pb) 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 with 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.

## Benefits

- Meets or exceeds EIA Standard 535BAAC
- Taped and reeled per EIA 481–1
- Symmetrical, compliant terminations
- Optical 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 1,000  $\mu$ F
- Tolerance  $\pm$ 10%,  $\pm$ 20%
- Voltage 2.5 – 50 VDC
- Extended range values
- Low profile case sizes
- RoHS Compliant and lead-free terminations  
(See [www.kemet.com](http://www.kemet.com) for transition information)
- Operating temperature: -55°C to +125°C

## Applications

Typical applications include decoupling and filtering in industrial and automotive end applications such as DC/DC converters, portable electronics, telecommunications, and control units.



## Environmental Compliance

RoHS Compliant (6/6) according to Directive 2002/95/EC when ordered with 100% Sn solder.



RoHS Compliant

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勝特力电子(深圳) 86-755-83298787  
[Http://www.100y.com.tw](http://www.100y.com.tw)

## SPICE

For a detailed analysis of specific part numbers, please visit [www.kemet.com](http://www.kemet.com) for a free download of KEMET's SPICE software. The KEMET SPICE program is freeware intended to aid design engineers in analyzing the performance of these capacitors over frequency, temperature, ripple, and DC bias conditions.

## Ordering Information

| T               | 491        | X                            | 157                                                                                    | K                                | 020                                                                                                                                      | A                   | T                                                                                                                                                                                       |                                    |
|-----------------|------------|------------------------------|----------------------------------------------------------------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Capacitor Class | Series     | Case Size                    | Capacitance Code (pF)                                                                  | Capacitance Tolerance            | Voltage                                                                                                                                  | Failure Rate/Design | Lead Material                                                                                                                                                                           | Packaging (C-Spec)                 |
| T = Tantalum    | Industrial | A, B, C, D, E, S, T, U, V, X | First two digits represent significant figures. Third digit specifies number of zeros. | K = $\pm 10\%$<br>M = $\pm 20\%$ | 2R5 = 2.5 V<br>003 = 3 V<br>004 = 4 V<br>006 = 6.3 V<br>010 = 10 V<br>016 = 16 V<br>020 = 20 V<br>025 = 25 V<br>035 = 35 V<br>050 = 50 V | A = N/A             | T = 100% Matte Tin (Sn) Plated*<br>H = Standard Solder Coated (SnPb 5% Pb minimum)<br>G = Gold Plated (A, B, C, D, X only)<br>N = Non-Magnetic 100% Tin (Sn)<br>M = Non-Magnetic (SnPb) | Blank = 7" Reel<br>7280 = 13" Reel |

## Performance Characteristics

| Item                    | Performance Characteristics                                |
|-------------------------|------------------------------------------------------------|
| Operating Temperature   | -55°C to 125°C                                             |
| Rated Capacitance Range | 0.1 – 1,000 $\mu$ F @ 120 Hz/25°C                          |
| Capacitance Tolerance   | K Tolerance (10%), M Tolerance (20%)                       |
| Rated Voltage Range     | 2.5 – 50 V                                                 |
| DF (120 Hz)             | Refer to Part Number Electrical Specification Table        |
| ESR (100 kHz)           | Refer to Part Number Electrical Specification Table        |
| Leakage Current         | $\leq 0.01$ CV ( $\mu$ A) at rated voltage after 5 minutes |

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## Qualification

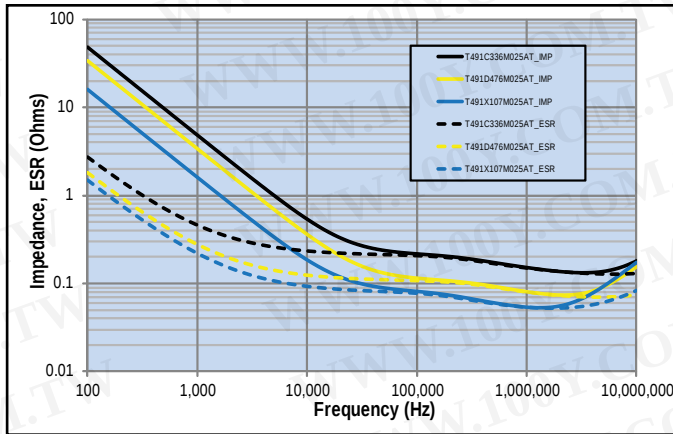
| Test                       | Condition                                                                                                              | Characteristics |                              |       |          |
|----------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------|-------|----------|
| Endurance                  | 85°C @ rated voltage, 2,000 hours<br>125°C @ 2/3 rated voltage, 2,000 hours                                            | Δ C/C           | Within ±10% of initial value |       |          |
|                            |                                                                                                                        | DF              | Within initial limits        |       |          |
|                            |                                                                                                                        | DCL             | Within 1.25 x initial limit  |       |          |
|                            |                                                                                                                        | ESR             | Within initial limits        |       |          |
| Storage Life               | 125°C @ 0 volts, 2,000 hours                                                                                           | Δ C/C           | Within ±10% of initial value |       |          |
|                            |                                                                                                                        | DF              | Within initial limits        |       |          |
|                            |                                                                                                                        | DCL             | Within 1.25 x initial limit  |       |          |
|                            |                                                                                                                        | ESR             | Within initial limits        |       |          |
| Thermal Shock              | MIL-STD-202, Method 107, Condition B, mounted, -55°C to 125°C, 1,000 cycles                                            | Δ C/C           | Within ±5% of initial value  |       |          |
|                            |                                                                                                                        | DF              | Within initial limits        |       |          |
|                            |                                                                                                                        | DCL             | Within 1.25 x initial limit  |       |          |
|                            |                                                                                                                        | ESR             | Within initial limits        |       |          |
| Temperature Stability      | Extreme temperature exposure at a succession of continuous steps at +25°C, -55°C, +25°C, +85°C, +125°C, +25°C.         |                 | +25°C                        | -55°C | +85°C    |
|                            |                                                                                                                        | Δ C/C           | IL*                          | ±10%  | ±10%     |
|                            |                                                                                                                        | DF              | IL                           | IL    | 1.5 x IL |
|                            |                                                                                                                        | DCL             | IL                           | n/a   | 10 x IL  |
| Surge Voltage              | 25°C and 85°C, 1.32 x rated voltage 1,000 cycles (125°C, 1.2 x rated voltage).                                         | Δ C/C           | Within ±5% of initial value  |       |          |
|                            |                                                                                                                        | DF              | Within initial limits        |       |          |
|                            |                                                                                                                        | DCL             | Within initial limits        |       |          |
|                            |                                                                                                                        | ESR             | Within initial limits        |       |          |
| Mechanical Shock/Vibration | MIL-STD-202, Method 213, Condition I, 100 G peak<br>MIL-STD-202, Method 204, Condition D, 10 Hz to 2,000 Hz, 20 G peak | Δ C/C           | Within ±10% of initial value |       |          |
|                            |                                                                                                                        | DF              | Within initial limits        |       |          |
|                            |                                                                                                                        | DCL             | Within initial limits        |       |          |

\*IL = Initial limit

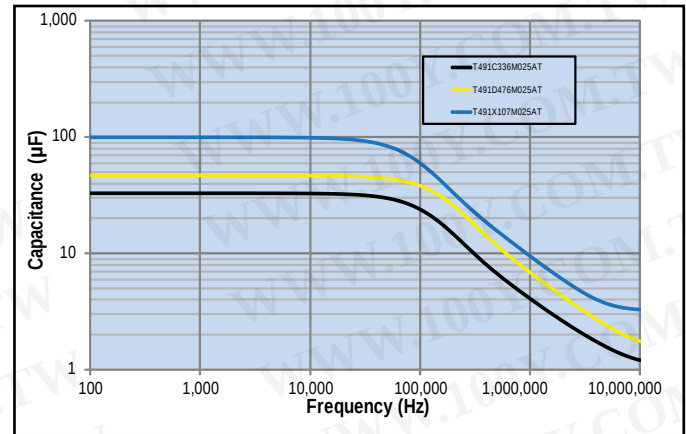
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## Electrical Characteristics

ESR vs. Frequency

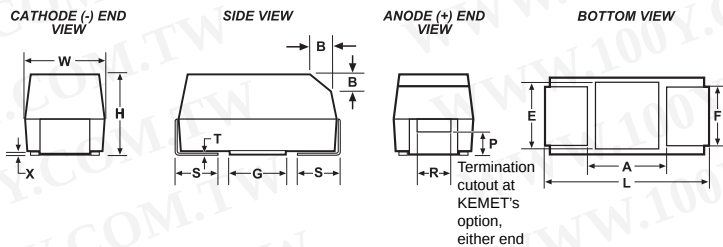


Capacitance vs. Frequency



## Dimensions – Millimeters (Inches)

Metric will govern



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| 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 (Ref)                      | P (Ref)    | R (Ref)    | T (Ref)     | A (Min)    | G (Ref)    | E (Ref)    |
| A         | 3216-18 | 3.2 ±0.2<br>(0.126 ±0.008) | 1.6 ±0.2<br>(0.063 ±0.008) | 1.6 ±0.2<br>(0.063 ±0.008) | 1.2 (.047)         | 0.8 (.031)         | 0.4 (.016)              | 0.10 ±0.10<br>(0.004 ±0.004) | 0.4 (.016) | 0.4 (.016) | 0.13 (.005) | 0.8 (.31)  | 1.1 (.043) | 1.3 (.051) |
| B         | 3528-21 | 3.5 ±0.2<br>(0.138 ±0.008) | 2.8 ±0.2<br>(0.110 ±0.008) | 1.9 ±0.2<br>(0.075 ±0.008) | 2.2 (.087)         | 0.8 (.031)         | 0.4 (.016)              | 0.10 ±0.10<br>(0.004 ±0.004) | 0.5 (.020) | 1.0 (.039) | 0.13 (.005) | 1.1 (.043) | 1.8 (.071) | 2.2 (.087) |
| C         | 6032-28 | 6.0 ±0.3<br>(0.236 ±0.03)  | 3.2 ±0.3<br>(0.126 ±0.012) | 2.5 ±0.3<br>(0.098 ±0.012) | 2.2 (.087)         | 1.3 (.051)         | 0.5 (.020)              | 0.10 ±0.10<br>(0.004 ±0.004) | 0.9 (.035) | 1.0 (.039) | 0.13 (.005) | 2.5 (.098) | 2.8 (.110) | 2.4 (.094) |
| D         | 7343-31 | 7.3 ±0.3<br>(0.287 ±0.012) | 4.3 ±0.3<br>(0.169 ±0.012) | 2.8 ±0.3<br>(0.110 ±0.012) | 2.4 (.094)         | 1.3 (.051)         | 0.5 (.020)              | 0.10 ±0.10<br>(0.004 ±0.004) | 0.9 (.035) | 1.0 (.039) | 0.13 (.005) | 3.8 (.150) | 3.5 (.138) | 3.5 (.138) |
| X         | 7343-43 | 7.3 ±0.3<br>(0.287 ±0.012) | 4.3 ±0.3<br>(0.169 ±0.012) | 4.0 ±0.3<br>(0.157 ±0.012) | 2.4 (.094)         | 1.3 (.051)         | 0.5 (.020)              | 0.10 ±0.10<br>(0.004 ±0.004) | 1.7 (.067) | 1.0 (.039) | 0.13 (.005) | 3.8 (.150) | 3.5 (.138) | 3.5 (.138) |
| E         | 7360-38 | 7.3 ±0.3<br>(0.287 ±0.012) | 6.0 ±0.3<br>(0.236 ±0.012) | 3.6 ±0.2<br>(0.142 ±0.008) | 4.1 (.161)         | 1.3 (.051)         | 0.5 (.020)              | 0.10 ±0.10<br>(0.004 ±0.004) | n/a        | n/a        | 0.13 (.005) | 3.8 (.150) | 3.5 (.138) | 3.5 (.138) |
| S         | 3216-12 | 3.2 ±0.2<br>(0.126 ±0.008) | 1.6 ±0.2<br>(0.063 ±0.008) | 1.2 (.047)                 | 1.2 (.047)         | 0.8 (.031)         | n/a                     | 0.05 (.002)                  | n/a        | n/a        | 0.13 (.005) | 0.8 (.031) | 1.1 (.043) | 1.3 (.051) |
| T         | 3528-12 | 3.5 ±0.2<br>(0.138 ±0.008) | 2.8 ±0.2<br>(0.110 ±0.008) | 1.2 (.047)                 | 2.2 (.087)         | 0.8 (.031)         | n/a                     | 0.05 (.002)                  | n/a        | n/a        | 0.13 (.005) | 1.1 (.043) | 1.8 (.071) | 2.2 (.087) |
| U         | 6032-15 | 6.0 ±0.3<br>(0.236 ±0.012) | 3.2 ±0.2<br>(0.110 ±0.008) | 1.5 (.059)                 | 2.2 (.087)         | 1.3 (.051)         | n/a                     | 0.05 (.002)                  | n/a        | n/a        | 0.13 (.005) | 2.5 (.098) | 2.8 (.110) | 2.4 (.094) |
| V         | 7343-20 | 7.3 ±0.3<br>(0.287 ±0.012) | 4.3 ±0.3<br>(0.169 ±0.012) | 2.0 (.079)                 | 2.4 (.094)         | 1.3 (.051)         | n/a                     | 0.05 (.002)                  | n/a        | n/a        | 0.13 (.005) | 3.8 (.150) | 3.5 (.138) | 3.5 (.138) |

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

\* MIL-PRF-55365/8 specified dimensions

**Table 1 – Ratings & Part Number Reference**

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |
|---------------|-----------|-------------------------|------------------------------|-------------------------------------|--------------------------------|---------------------------------|----------------------------------|--------------------------|---------------------------|--------------------------------|
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| 2.5           | 100       | T/3528-12               | T491T107(1)2R5A(2)           | 2.5                                 | 24.0                           | 3.9                             | 134                              | 121                      | 54                        | 1                              |
| 2.5           | 220       | D/7343-31               | T491D227(1)2R5A(2)           | 5.5                                 | 8.0                            | 0.3                             | 707                              | 636                      | 283                       | 1                              |
| 3             | 33        | A/3216-18               | T491A336(1)003A(2)           | 1.0                                 | 6.0                            | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 4             | 3.3       | A/3216-18               | T491A335(1)004A(2)           | 0.5                                 | 6.0                            | 8.0                             | 97                               | 87                       | 39                        | 1                              |
| 4             | 4.7       | A/3216-18               | T491A475(1)004A(2)           | 0.5                                 | 6.0                            | 8.0                             | 97                               | 87                       | 39                        | 1                              |
| 4             | 6.8       | A/3216-18               | T491A685(1)004A(2)           | 0.5                                 | 6.0                            | 6.0                             | 112                              | 101                      | 45                        | 1                              |
| 4             | 6.8       | S/3216-12               | T491S685(1)004A(2)           | 0.5                                 | 6.0                            | 15.0                            | 63                               | 57                       | 25                        | 1                              |
| 4             | 10        | B/3528-21               | T491B106(1)004A(2)           | 0.5                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 4             | 10        | A/3216-18               | T491A106(1)004A(2)           | 0.5                                 | 6.0                            | 6.0                             | 112                              | 101                      | 45                        | 1                              |
| 4             | 10        | S/3216-12               | T491S106(1)004A(2)           | 0.5                                 | 6.0                            | 15.0                            | 63                               | 57                       | 25                        | 1                              |
| 4             | 15        | B/3528-21               | T491B156(1)004A(2)           | 0.6                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 4             | 15        | A/3216-18               | T491A156(1)004A(2)           | 0.6                                 | 6.0                            | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 4             | 15        | T/3528-12               | T491T156(1)004A(2)           | 0.6                                 | 6.0                            | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 4             | 15        | S/3216-12               | T491S156(1)004A(2)           | 0.6                                 | 10.0                           | 15.0                            | 63                               | 57                       | 25                        | 1                              |
| 4             | 22        | C/6032-28               | T491C226(1)004A(2)           | 0.9                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 4             | 22        | B/3528-21               | T491B226(1)004A(2)           | 0.9                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 4             | 22        | A/3216-18               | T491A226(1)004A(2)           | 0.9                                 | 6.0                            | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 4             | 22        | T/3528-12               | T491T226(1)004A(2)           | 0.9                                 | 6.0                            | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 4             | 22        | S/3216-12               | T491S226(1)004A(2)           | 0.9                                 | 10.0                           | 10.0                            | 77                               | 69                       | 31                        | 1                              |
| 4             | 33        | C/6032-28               | T491C336(1)004A(2)           | 1.3                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 4             | 33        | U/6032-15               | T491U336(1)004A(2)           | 1.3                                 | 6.0                            | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 4             | 33        | B/3528-21               | T491B336(1)004A(2)           | 1.3                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 4             | 33        | A/3216-18               | T491A336(1)004A(2)           | 1.3                                 | 6.0                            | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 4             | 33        | T/3528-12               | T491T336(1)004A(2)           | 1.3                                 | 8.0                            | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 4             | 47        | C/6032-28               | T491C476(1)004A(2)           | 1.9                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 4             | 47        | U/6032-15               | T491U476(1)004A(2)           | 1.9                                 | 6.0                            | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 4             | 47        | B/3528-21               | T491B476(1)004A(2)           | 1.9                                 | 6.0                            | 3.0                             | 168                              | 151                      | 67                        | 1                              |
| 4             | 47        | A/3216-18               | T491A476(M)004A(2)           | 1.9                                 | 12.0                           | 2.5                             | 173                              | 156                      | 69                        | 1                              |
| 4             | 47        | T/3528-12               | T491T476(M)004A(2)           | 1.9                                 | 12.0                           | 6.0                             | 108                              | 97                       | 43                        | 1                              |
| 4             | 68        | D/7343-31               | T491D686(1)004A(2)           | 2.7                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 4             | 68        | C/6032-28               | T491C686(1)004A(2)           | 2.7                                 | 6.0                            | 1.6                             | 262                              | 236                      | 105                       | 1                              |
| 4             | 68        | U/6032-15               | T491U686(1)004A(2)           | 2.7                                 | 6.0                            | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 4             | 68        | B/3528-21               | T491B686(1)004A(2)           | 2.7                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 4             | 68        | A/3216-18               | T491A686(1)004A(2)           | 2.7                                 | 30.0                           | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 4             | 100       | D/7343-31               | T491D107(1)004A(2)           | 4.0                                 | 8.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 4             | 100       | C/6032-28               | T491C107(1)004A(2)           | 4.0                                 | 8.0                            | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 4             | 100       | U/6032-15               | T491U107(1)004A(2)           | 4.0                                 | 10.0                           | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 4             | 100       | B/3528-21               | T491B107(M)004A(2)           | 4.0                                 | 8.0                            | 0.9                             | 307                              | 276                      | 123                       | 1                              |
| 4             | 100       | A/3216-18               | T491A107(M)004A(2)           | 4.0                                 | 30.0                           | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 4             | 100       | T/3528-12               | T491T107(M)004A(2)           | 4.0                                 | 30.0                           | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 4             | 150       | D/7343-31               | T491D157(1)004A(2)           | 6.0                                 | 8.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 4             | 150       | U/6032-15               | T491U157(1)004AT             | 6.0                                 | 8.0                            | 1.3                             | 263                              | 237                      | 105                       | 1                              |
| 4             | 150       | V/7343-20               | T491V157(1)004A(2)           | 6.0                                 | 8.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 4             | 150       | C/6032-28               | T491C157(1)004A(2)           | 6.0                                 | 8.0                            | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 4             | 150       | B/3528-21               | T491B157(M)004A(2)           | 6.0                                 | 12.0                           | 2.0                             | 206                              | 185                      | 82                        | 1                              |
| 4             | 220       | V/7343-20               | T491V227(1)004A(2)           | 8.8                                 | 8.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 4             | 220       | B/3528-21               | T491B227(M)004A(2)           | 8.8                                 | 18.0                           | 0.5                             | 412                              | 371                      | 165                       | 1                              |
| 4             | 220       | C/6032-28               | T491C227(1)004AT             | 8.8                                 | 15.0                           | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 4             | 220       | D/7343-31               | T491D227(1)004AT             | 8.8                                 | 8.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 4             | 220       | W/7343-15               | T491W227(1)004AT             | 8.8                                 | 8.0                            | 0.8                             | 474                              | 427                      | 190                       | 1                              |
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |

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

(2) To complete KEMET part number, insert T = 100% Matte Tin (Sn) Plated, G = Gold Plated, H = Standard Solder coated (SnPb 5% Pb minimum), N = Non-Magnetic 100% Tin (Sn), M = Non-Magnetic (SnPb). Designates Termination Finish.

Refer to Ordering Information for additional detail.

Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitution will be marked with the higher voltage rating. Substitutions can include better than series.

Table 1 – Ratings & Part Number Reference cont'd

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |
|---------------|-----------|-------------------------|------------------------------|-------------------------------------|--------------------------------|---------------------------------|----------------------------------|--------------------------|---------------------------|--------------------------------|
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| 4             | 330       | D/7343-31               | T491D337(1)004A(2)           | 13.2                                | 8.0                            | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 4             | 330       | V/7343-20               | T491V337(1)004A(2)           | 13.2                                | 12.0                           | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 4             | 330       | C/6032-28               | T491C337(1)004A(2)           | 13.2                                | 10.0                           | 0.9                             | 350                              | 315                      | 140                       | 1                              |
| 4             | 330       | X/7343-43               | T491X337(1)004AT             | 13.2                                | 8.0                            | 0.8                             | 454                              | 409                      | 182                       | 1                              |
| 4             | 470       | X/7343-43               | T491X477(1)004A(2)           | 18.8                                | 8.0                            | 0.5                             | 574                              | 517                      | 230                       | 1                              |
| 4             | 470       | D/7343-31               | T491D477(1)004A(2)           | 18.8                                | 8.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 4             | 680       | X/7343-43               | T491X687(1)004A(2)           | 27.2                                | 12.0                           | 0.5                             | 574                              | 517                      | 230                       | 1                              |
| 4             | 680       | D/7343-31               | T491D687(1)004A(2)           | 27.2                                | 12.0                           | 0.5                             | 548                              | 493                      | 219                       | 1                              |
| 4             | 1000      | X/7343-43               | T491X108(1)004A(2)           | 40.0                                | 12.0                           | 0.5                             | 574                              | 517                      | 230                       | 1                              |
| 4             | 1000      | E/7360-38               | T491E108(M)004A(2)           | 40.0                                | 15.0                           | 0.2                             | 1000                             | 900                      | 400                       | 1                              |
| 6.3           | 2.2       | A/3216-18               | T491A225(1)006A(2)           | 0.5                                 | 6.0                            | 8.0                             | 97                               | 87                       | 39                        | 1                              |
| 6.3           | 3.3       | A/3216-18               | T491A335(1)006A(2)           | 0.5                                 | 6.0                            | 8.0                             | 97                               | 87                       | 39                        | 1                              |
| 6.3           | 4.7       | A/3216-18               | T491A475(1)006A(2)           | 0.5                                 | 6.0                            | 6.0                             | 112                              | 101                      | 45                        | 1                              |
| 6.3           | 4.7       | S/3216-12               | T491S475(1)006A(2)           | 0.5                                 | 6.0                            | 15.0                            | 63                               | 57                       | 25                        | 1                              |
| 6.3           | 6.8       | B/3528-21               | T491B685(1)006A(2)           | 0.5                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 6.3           | 6.8       | A/3216-18               | T491A685(1)006A(2)           | 0.5                                 | 6.0                            | 6.0                             | 112                              | 101                      | 45                        | 1                              |
| 6.3           | 6.8       | S/3216-12               | T491S685(1)006A(2)           | 0.5                                 | 6.0                            | 15.0                            | 63                               | 57                       | 25                        | 1                              |
| 6.3           | 10        | B/3528-21               | T491B106(1)006A(2)           | 0.6                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 6.3           | 10        | A/3216-18               | T491A106(1)006A(2)           | 0.6                                 | 6.0                            | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 6.3           | 10        | T/3528-12               | T491T106(1)006A(2)           | 0.6                                 | 6.0                            | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 6.3           | 10        | S/3216-12               | T491S106(1)006A(2)           | 0.6                                 | 10.0                           | 15.0                            | 63                               | 57                       | 25                        | 1                              |
| 6.3           | 15        | C/6032-28               | T491C156(1)006A(2)           | 0.9                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 6.3           | 15        | B/3528-21               | T491B156(1)006A(2)           | 0.9                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 6.3           | 15        | A/3216-18               | T491A156(1)006A(2)           | 0.9                                 | 6.0                            | 3.5                             | 146                              | 131                      | 58                        | 1                              |
| 6.3           | 15        | T/3528-12               | T491T156(1)006A(2)           | 0.9                                 | 6.0                            | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 6.3           | 15        | S/3216-12               | T491S156(1)006A(2)           | 0.9                                 | 15.0                           | 10.0                            | 77                               | 69                       | 31                        | 1                              |
| 6.3           | 22        | C/6032-28               | T491C226(1)006A(2)           | 1.4                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 6.3           | 22        | U/6032-15               | T491U226(1)006A(2)           | 1.4                                 | 6.0                            | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 6.3           | 22        | B/3528-21               | T491B226(1)006A(2)           | 1.4                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 6.3           | 22        | A/3216-18               | T491A226(1)006A(2)           | 1.4                                 | 6.0                            | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 6.3           | 22        | T/3528-12               | T491T226(1)006A(2)           | 1.4                                 | 8.0                            | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 6.3           | 33        | C/6032-28               | T491C336(1)006A(2)           | 2.1                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 6.3           | 33        | U/6032-15               | T491U336(1)006A(2)           | 2.1                                 | 6.0                            | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 6.3           | 33        | B/3528-21               | T491B336(1)006A(2)           | 2.1                                 | 6.0                            | 3.0                             | 168                              | 151                      | 67                        | 1                              |
| 6.3           | 33        | A/3216-18               | T491A336(1)006A(2)           | 2.1                                 | 12.0                           | 2.5                             | 173                              | 156                      | 69                        | 1                              |
| 6.3           | 33        | T/3528-12               | T491T336(1)006A(2)           | 2.1                                 | 12.0                           | 6.0                             | 108                              | 97                       | 43                        | 1                              |
| 6.3           | 47        | D/7343-31               | T491D476(1)006A(2)           | 3.0                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 6.3           | 47        | C/6032-28               | T491C476(1)006A(2)           | 3.0                                 | 6.0                            | 1.6                             | 262                              | 236                      | 105                       | 1                              |
| 6.3           | 47        | U/6032-15               | T491U476(1)006A(2)           | 3.0                                 | 6.0                            | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 6.3           | 47        | V/7343-20               | T491V476(1)006AT             | 3.0                                 | 6.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 6.3           | 47        | B/3528-21               | T491B476(1)006A(2)           | 3.0                                 | 6.0                            | 2.0                             | 206                              | 185                      | 82                        | 1                              |
| 6.3           | 47        | A/3216-18               | T491A476(M)006A(2)           | 3.0                                 | 12.0                           | 3.5                             | 146                              | 131                      | 58                        | 1                              |
| 6.3           | 47        | T/3528-12               | T491T476(1)006A(2)           | 3.0                                 | 24.0                           | 4.4                             | 126                              | 113                      | 50                        | 1                              |
| 6.3           | 68        | D/7343-31               | T491D686(1)006A(2)           | 4.3                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 6.3           | 68        | C/6032-28               | T491C686(1)006A(2)           | 4.3                                 | 6.0                            | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 6.3           | 68        | U/6032-15               | T491U686(1)006A(2)           | 4.3                                 | 10.0                           | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 6.3           | 68        | V/7343-20               | T491V686(1)006AT             | 4.3                                 | 6.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 6.3           | 68        | B/3528-21               | T491B686(1)006A(2)           | 4.3                                 | 8.0                            | 0.9                             | 307                              | 276                      | 123                       | 1                              |
| 6.3           | 68        | A/3216-18               | T491A686(1)006A(2)           | 4.3                                 | 30.0                           | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 6.3           | 100       | D/7343-31               | T491D107(1)006A(2)           | 6.3                                 | 8.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |

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

(2) To complete KEMET part number, insert T = 100% Matte Tin (Sn) Plated, G = Gold Plated, H = Standard Solder coated (SnPb 5% Pb minimum), N = Non-Magnetic 100% Tin (Sn), M = Non-Magnetic (SnPb). Designates Termination Finish.

Refer to Ordering Information for additional detail.

Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitution will be marked with the higher voltage rating. Substitutions can include better than series.

Table 1 – Ratings & Part Number Reference cont'd

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |
|---------------|-----------|-------------------------|------------------------------|-------------------------------------|--------------------------------|---------------------------------|----------------------------------|--------------------------|---------------------------|--------------------------------|
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| 6.3           | 100       | V/7343-20               | T491V107(1)006A(2)           | 6.3                                 | 8.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 6.3           | 100       | C/6032-28               | T491C107(1)006A(2)           | 6.3                                 | 8.0                            | 0.9                             | 350                              | 315                      | 140                       | 1                              |
| 6.3           | 100       | U/6032-15               | T491U107(1)006A(2)           | 6.3                                 | 10.0                           | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 6.3           | 100       | B/3528-21               | T491B107(1)006A(2)           | 6.3                                 | 15.0                           | 3.0                             | 168                              | 151                      | 67                        | 1                              |
| 6.3           | 150       | B/3528-21               | T491B157M006A(2)             | 9.5                                 | 15.0                           | 3.0                             | 168                              | 151                      | 67                        | 1                              |
| 6.3           | 150       | D/7343-31               | T491D157(1)006A(2)           | 9.5                                 | 8.0                            | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 6.3           | 150       | C/6032-28               | T491C157(1)006A(2)           | 9.5                                 | 8.0                            | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 6.3           | 150       | V/7343-20               | T491V157(1)006A(2)           | 9.5                                 | 8.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 6.3           | 150       | U/6032-15               | T491U157(1)006AT             | 9.5                                 | 8.0                            | 0.6                             | 387                              | 348                      | 155                       | 1                              |
| 6.3           | 150       | W/7343-15               | T491W157(1)006AT             | 9.5                                 | 8.0                            | 0.8                             | 474                              | 427                      | 190                       | 1                              |
| 6.3           | 220       | X/7343-43               | T491X227(1)006A(2)           | 13.9                                | 8.0                            | 0.7                             | 486                              | 437                      | 194                       | 1                              |
| 6.3           | 220       | D/7343-31               | T491D227(1)006A(2)           | 13.9                                | 8.0                            | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 6.3           | 220       | C/6032-28               | T491C227(M)006A(2)           | 13.9                                | 10.0                           | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 6.3           | 220       | V/7343-20               | T491V227(1)006A(2)           | 13.9                                | 12.0                           | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 6.3           | 220       | W/7343-15               | T491W227(1)006AT             | 13.9                                | 8.0                            | 0.8                             | 474                              | 427                      | 190                       | 1                              |
| 6.3           | 330       | V/7343-20               | T491V337(1)006AT             | 20.8                                | 8.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 6.3           | 330       | X/7343-43               | T491X337(1)006A(2)           | 20.8                                | 8.0                            | 0.4                             | 642                              | 578                      | 257                       | 1                              |
| 6.3           | 330       | D/7343-31               | T491D337(1)006A(2)           | 20.8                                | 8.0                            | 0.4                             | 612                              | 551                      | 245                       | 1                              |
| 6.3           | 330       | E/7360-38               | T491E337(1)006A(2)           | 20.8                                | 8.0                            | 0.5                             | 632                              | 569                      | 253                       | 1                              |
| 6.3           | 470       | X/7343-43               | T491X477(1)006A(2)           | 29.6                                | 10.0                           | 0.4                             | 642                              | 578                      | 257                       | 1                              |
| 6.3           | 470       | D/7343-31               | T491D477(M)006A(2)           | 29.6                                | 12.0                           | 0.4                             | 612                              | 551                      | 245                       | 1                              |
| 6.3           | 470       | E/7360-38               | T491E477(1)006A(2)           | 29.6                                | 10.0                           | 0.4                             | 707                              | 636                      | 283                       | 1                              |
| 6.3           | 680       | X/7343-43               | T491X687(1)006A(2)           | 42.8                                | 15.0                           | 0.6                             | 524                              | 472                      | 210                       | 1                              |
| 6.3           | 680       | E/7360-38               | T491E687(M)006A(2)           | 42.8                                | 12.0                           | 0.5                             | 632                              | 569                      | 253                       | 1                              |
| 6.3           | 1000      | X/7343-43               | T491X108(1)006AT             | 63.0                                | 15.0                           | 0.6                             | 524                              | 472                      | 210                       | 1                              |
| 10            | 1.5       | A/3216-18               | T491A155(1)010A(2)           | 0.5                                 | 6.0                            | 8.0                             | 97                               | 87                       | 39                        | 1                              |
| 10            | 2.2       | B/3528-21               | T491B225(1)010A(2)           | 0.5                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 10            | 2.2       | A/3216-18               | T491A225(1)010A(2)           | 0.5                                 | 6.0                            | 8.0                             | 97                               | 87                       | 39                        | 1                              |
| 10            | 3.3       | A/3216-18               | T491A335(1)010A(2)           | 0.5                                 | 6.0                            | 6.0                             | 112                              | 101                      | 45                        | 1                              |
| 10            | 3.3       | S/3216-12               | T491S335(1)010A(2)           | 0.5                                 | 6.0                            | 15.0                            | 63                               | 57                       | 25                        | 1                              |
| 10            | 4.7       | B/3528-21               | T491B475(1)010A(2)           | 0.5                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 10            | 4.7       | A/3216-18               | T491A475(1)010A(2)           | 0.5                                 | 6.0                            | 5.0                             | 122                              | 110                      | 49                        | 1                              |
| 10            | 4.7       | S/3216-12               | T491S475(1)010A(2)           | 0.5                                 | 6.0                            | 15.0                            | 63                               | 57                       | 25                        | 1                              |
| 10            | 6.8       | B/3528-21               | T491B685(1)010A(2)           | 0.7                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 10            | 6.8       | A/3216-18               | T491A685(1)010A(2)           | 0.7                                 | 6.0                            | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 10            | 6.8       | T/3528-12               | T491T685(1)010A(2)           | 0.7                                 | 6.0                            | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 10            | 6.8       | S/3216-12               | T491S685(1)010A(2)           | 0.7                                 | 10.0                           | 15.0                            | 63                               | 57                       | 25                        | 1                              |
| 10            | 10        | C/6032-28               | T491C106(1)010A(2)           | 1.0                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 10            | 10        | B/3528-21               | T491B106(1)010A(2)           | 1.0                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 10            | 10        | A/3216-18               | T491A106(1)010A(2)           | 1.0                                 | 6.0                            | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 10            | 10        | T/3528-12               | T491T106(1)010A(2)           | 1.0                                 | 6.0                            | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 10            | 10        | S/3216-12               | T491S106(1)010A(2)           | 1.0                                 | 10.0                           | 15.0                            | 63                               | 57                       | 25                        | 1                              |
| 10            | 15        | C/6032-28               | T491C156(1)010A(2)           | 1.5                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 10            | 15        | U/6032-15               | T491U156(1)010A(2)           | 1.5                                 | 6.0                            | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 10            | 15        | B/3528-21               | T491B156(1)010A(2)           | 1.5                                 | 6.0                            | 2.8                             | 174                              | 157                      | 70                        | 1                              |
| 10            | 15        | A/3216-18               | T491A156(1)010A(2)           | 1.5                                 | 8.0                            | 6.0                             | 112                              | 101                      | 45                        | 1                              |
| 10            | 15        | T/3528-12               | T491T156(1)010A(2)           | 1.5                                 | 8.0                            | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 10            | 22        | C/6032-28               | T491C226(1)010A(2)           | 2.2                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 10            | 22        | U/6032-15               | T491U226(1)010A(2)           | 2.2                                 | 6.0                            | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 10            | 22        | B/3528-21               | T491B226(1)010A(2)           | 2.2                                 | 6.0                            | 2.4                             | 188                              | 169                      | 75                        | 1                              |
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |

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

(2) To complete KEMET part number, insert T = 100% Matte Tin (Sn) Plated, G = Gold Plated, H = Standard Solder coated (SnPb 5% Pb minimum), N = Non-Magnetic 100% Tin (Sn), M = Non-Magnetic (SnPb). Designates Termination Finish.

Refer to Ordering Information for additional detail.

Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitution will be marked with the higher voltage rating. Substitutions can include better than series.

Table 1 – Ratings & Part Number Reference cont'd

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |
|---------------|-----------|-------------------------|------------------------------|-------------------------------------|--------------------------------|---------------------------------|----------------------------------|--------------------------|---------------------------|--------------------------------|
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| 10            | 22        | A/3216-18               | T491A226(M)010A(2)           | 2.2                                 | 10.0                           | 6.0                             | 112                              | 101                      | 45                        | 1                              |
| 10            | 22        | T/3528-12               | T491T226(1)010A(2)           | 2.2                                 | 12.0                           | 8.0                             | 94                               | 85                       | 38                        | 1                              |
| 10            | 33        | D/7343-31               | T491D336(1)010A(2)           | 3.3                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 10            | 33        | V/7343-20               | T491V336(1)010A(2)           | 3.3                                 | 6.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 10            | 33        | C/6032-28               | T491C336(1)010A(2)           | 3.3                                 | 6.0                            | 1.6                             | 262                              | 236                      | 105                       | 1                              |
| 10            | 33        | U/6032-15               | T491U336(1)010A(2)           | 3.3                                 | 6.0                            | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 10            | 33        | B/3528-21               | T491B336(1)010A(2)           | 3.3                                 | 6.0                            | 1.8                             | 217                              | 195                      | 87                        | 1                              |
| 10            | 33        | T/3528-12               | T491T336(1)010A(2)           | 3.3                                 | 24.0                           | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 10            | 33        | A/3216-18               | T491A336(1)010A(2)           | 3.3                                 | 15.0                           | 6.0                             | 112                              | 101                      | 45                        | 1                              |
| 10            | 47        | D/7343-31               | T491D476(1)010A(2)           | 4.7                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 10            | 47        | V/7343-20               | T491V476(1)010A(2)           | 4.7                                 | 6.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 10            | 47        | C/6032-28               | T491C476(1)010A(2)           | 4.7                                 | 6.0                            | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 10            | 47        | U/6032-15               | T491U476(1)010A(2)           | 4.7                                 | 10.0                           | 2.2                             | 202                              | 182                      | 81                        | 1                              |
| 10            | 47        | B/3528-21               | T491B476(1)010A(2)           | 4.7                                 | 8.0                            | 1.0                             | 292                              | 263                      | 117                       | 1                              |
| 10            | 68        | D/7343-31               | T491D686(1)010A(2)           | 6.8                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 10            | 68        | V/7343-20               | T491V686(1)010A(2)           | 6.8                                 | 6.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 10            | 68        | C/6032-28               | T491C686(1)010A(2)           | 6.8                                 | 6.0                            | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 10            | 68        | W/7343-15               | T491W686(1)010AT             | 6.8                                 | 6.0                            | 1.2                             | 387                              | 348                      | 155                       | 1                              |
| 10            | 68        | U/6032-15               | T491U686(1)010A(2)           | 6.8                                 | 10.0                           | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 10            | 68        | B/3528-21               | T491B686(M)010A(2)           | 6.8                                 | 10.0                           | 3.0                             | 168                              | 151                      | 67                        | 1                              |
| 10            | 100       | B/3528-21               | T491B107(1)010A(2)           | 10.0                                | 15.0                           | 3.0                             | 168                              | 151                      | 67                        | 1                              |
| 10            | 100       | D/7343-31               | T491D107(1)010A(2)           | 10.0                                | 8.0                            | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 10            | 100       | U/6032-15               | T491U107(1)010AT             | 10.0                                | 8.0                            | 0.7                             | 359                              | 323                      | 144                       | 1                              |
| 10            | 100       | W/7343-15               | T491W107(1)010AT             | 10.0                                | 8.0                            | 0.8                             | 474                              | 427                      | 190                       | 1                              |
| 10            | 100       | C/6032-28               | T491C107(1)010A(2)           | 10.0                                | 8.0                            | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 10            | 100       | V/7343-20               | T491V107(1)010A(2)           | 10.0                                | 8.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 10            | 150       | X/7343-43               | T491X157(1)010A(2)           | 15.0                                | 8.0                            | 0.7                             | 486                              | 437                      | 194                       | 1                              |
| 10            | 150       | D/7343-31               | T491D157(1)010A(2)           | 15.0                                | 8.0                            | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 10            | 150       | C/6032-28               | T491C157(1)010A(2)           | 15.0                                | 10.0                           | 0.9                             | 350                              | 315                      | 140                       | 1                              |
| 10            | 150       | V/7343-20               | T491V157(1)010A(2)           | 15.0                                | 8.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 10            | 220       | X/7343-43               | T491X227(1)010A(2)           | 22.0                                | 8.0                            | 0.5                             | 574                              | 517                      | 230                       | 1                              |
| 10            | 220       | D/7343-31               | T491D227(1)010A(2)           | 22.0                                | 8.0                            | 0.5                             | 548                              | 493                      | 219                       | 1                              |
| 10            | 330       | D/7343-31               | T491D337(M)010A(2)           | 33.0                                | 10.0                           | 0.5                             | 548                              | 493                      | 219                       | 1                              |
| 10            | 330       | X/7343-43               | T491X337(1)010A(2)           | 33.0                                | 10.0                           | 0.5                             | 574                              | 517                      | 230                       | 1                              |
| 10            | 330       | E/7360-38               | T491E337(1)010A(2)           | 33.0                                | 10.0                           | 0.5                             | 632                              | 569                      | 253                       | 1                              |
| 10            | 470       | X/7343-43               | T491X477(1)010A(2)           | 47                                  | 10                             | 0.2                             | 908                              | 817.2                    | 363.2                     | 1                              |
| 10            | 470       | E/7360-38               | T491E477(M)010A(2)           | 47.0                                | 12.0                           | 0.5                             | 632                              | 569                      | 253                       | 1                              |
| 16            | 1         | A/3216-18               | T491A105(1)016A(2)           | 0.5                                 | 4.0                            | 10.0                            | 87                               | 78                       | 35                        | 1                              |
| 16            | 1.5       | A/3216-18               | T491A155(1)016A(2)           | 0.5                                 | 6.0                            | 8.0                             | 97                               | 87                       | 39                        | 1                              |
| 16            | 2.2       | A/3216-18               | T491A225(1)016A(2)           | 0.5                                 | 6.0                            | 6.0                             | 112                              | 101                      | 45                        | 1                              |
| 16            | 2.2       | S/3216-12               | T491S225(1)016A(2)           | 0.5                                 | 6.0                            | 15.0                            | 63                               | 57                       | 25                        | 1                              |
| 16            | 3.3       | B/3528-21               | T491B335(1)016A(2)           | 0.5                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 16            | 3.3       | A/3216-18               | T491A335(1)016A(2)           | 0.5                                 | 6.0                            | 5.0                             | 122                              | 110                      | 49                        | 1                              |
| 16            | 4.7       | C/6032-28               | T491C475(1)016A(2)           | 0.8                                 | 6.0                            | 2.4                             | 214                              | 193                      | 86                        | 1                              |
| 16            | 4.7       | B/3528-21               | T491B475(1)016A(2)           | 0.8                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 16            | 4.7       | A/3216-18               | T491A475(1)016A(2)           | 0.8                                 | 6.0                            | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 16            | 4.7       | T/3528-12               | T491T475(1)016A(2)           | 0.8                                 | 6.0                            | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 16            | 6.8       | C/6032-28               | T491C685(1)016A(2)           | 1.1                                 | 6.0                            | 1.9                             | 241                              | 217                      | 96                        | 1                              |
| 16            | 6.8       | B/3528-21               | T491B685(1)016A(2)           | 1.1                                 | 6.0                            | 2.5                             | 184                              | 166                      | 74                        | 1                              |
| 16            | 6.8       | A/3216-18               | T491A685(1)016A(2)           | 1.1                                 | 6.0                            | 3.5                             | 146                              | 131                      | 58                        | 1                              |
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |

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

(2) To complete KEMET part number, insert T = 100% Matte Tin (Sn) Plated, G = Gold Plated, H = Standard Solder coated (SnPb 5% Pb minimum), N = Non-Magnetic 100% Tin (Sn), M = Non-Magnetic (SnPb). Designates Termination Finish.

Refer to Ordering Information for additional detail.

Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitution will be marked with the higher voltage rating. Substitutions can include better than series.

Table 1 – Ratings & Part Number Reference cont'd

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |
|---------------|-----------|-------------------------|------------------------------|-------------------------------------|--------------------------------|---------------------------------|----------------------------------|--------------------------|---------------------------|--------------------------------|
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| 16            | 10        | C/6032-28               | T491C106(1)016A(2)           | 1.6                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 16            | 10        | U/6032-15               | T491U106(1)016A(2)           | 1.6                                 | 6.0                            | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 16            | 10        | B/3528-21               | T491B106(1)016A(2)           | 1.6                                 | 6.0                            | 2.8                             | 174                              | 157                      | 70                        | 1                              |
| 16            | 10        | A/3216-18               | T491A106(1)016A(2)           | 1.6                                 | 8.0                            | 7.0                             | 104                              | 94                       | 42                        | 1                              |
| 16            | 10        | T/3528-12               | T491T106(1)016A(2)           | 1.6                                 | 8.0                            | 8.0                             | 94                               | 85                       | 38                        | 1                              |
| 16            | 15        | C/6032-28               | T491C156(1)016A(2)           | 2.4                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 16            | 15        | U/6032-15               | T491U156(1)016A(2)           | 2.4                                 | 6.0                            | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 16            | 15        | B/3528-21               | T491B156(1)016A(2)           | 2.4                                 | 6.0                            | 2.5                             | 184                              | 166                      | 74                        | 1                              |
| 16            | 15        | A/3216-18               | T491A156(1)016A(2)           | 2.4                                 | 8.0                            | 3.5                             | 146                              | 131                      | 58                        | 1                              |
| 16            | 22        | D/7343-31               | T491D226(1)016A(2)           | 3.5                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 16            | 22        | C/6032-28               | T491C226(1)016A(2)           | 3.5                                 | 6.0                            | 1.6                             | 262                              | 236                      | 105                       | 1                              |
| 16            | 22        | U/6032-15               | T491U226(1)016A(2)           | 3.5                                 | 10.0                           | 3.0                             | 173                              | 156                      | 69                        | 1                              |
| 16            | 22        | B/3528-21               | T491B226(1)016A(2)           | 3.5                                 | 6.0                            | 2.2                             | 197                              | 177                      | 79                        | 1                              |
| 16            | 33        | D/7343-31               | T491D336(1)016A(2)           | 5.3                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 16            | 33        | C/6032-28               | T491C336(1)016A(2)           | 5.3                                 | 6.0                            | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 16            | 33        | U/6032-15               | T491U336(1)016A(2)           | 5.3                                 | 12.0                           | 3.0                             | 173                              | 156                      | 69                        | 1                              |
| 16            | 33        | B/3528-21               | T491B336(1)016A(2)           | 5.3                                 | 8.0                            | 2.1                             | 201                              | 181                      | 80                        | 1                              |
| 16            | 47        | D/7343-31               | T491D476(1)016A(2)           | 7.5                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 16            | 47        | V/7343-20               | T491V476(1)016A(2)           | 7.5                                 | 6.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 16            | 47        | C/6032-28               | T491C476(1)016A(2)           | 7.5                                 | 6.0                            | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 16            | 68        | V/7343-20               | T491V686(1)016A(2)           | 10.9                                | 6.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 16            | 68        | C/6032-28               | T491C686(1)016AT             | 10.9                                | 6.0                            | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 16            | 68        | W/7343-15               | T491W686(1)016AT             | 10.9                                | 6.0                            | 0.8                             | 474                              | 427                      | 190                       | 1                              |
| 16            | 68        | D/7343-31               | T491D686(1)016A(2)           | 10.9                                | 6.0                            | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 16            | 68        | C/6032-28               | T491C686(1)016A(2)           | 10.9                                | 12.0                           | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 16            | 100       | X/7343-43               | T491X107(1)016A(2)           | 16.0                                | 8.0                            | 0.7                             | 486                              | 437                      | 194                       | 1                              |
| 16            | 100       | C/6032-28               | T491C107(1)016AT             | 16.0                                | 10.0                           | 1.0                             | 332                              | 299                      | 133                       | 1                              |
| 16            | 100       | V/7343-20               | T491V107(1)016A(2)           | 16.0                                | 12.0                           | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 16            | 100       | D/7343-31               | T491D107(1)016A(2)           | 16.0                                | 8.0                            | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 16            | 150       | X/7343-43               | T491X157(1)016A(2)           | 24.0                                | 8.0                            | 0.5                             | 574                              | 517                      | 230                       | 1                              |
| 16            | 150       | D/7343-31               | T491D157(1)016A(2)           | 24.0                                | 12.0                           | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 16            | 220       | X/7343-43               | T491X227(1)016A(2)           | 35.2                                | 10.0                           | 0.5                             | 574                              | 517                      | 230                       | 1                              |
| 16            | 220       | E/7360-38               | T491E227(1)016A(2)           | 35.2                                | 7.2                            | 0.9                             | 471                              | 424                      | 188                       | 1                              |
| 20            | 0.68      | A/3216-18               | T491A684(1)020A(2)           | 0.5                                 | 4.0                            | 12.0                            | 79                               | 71                       | 32                        | 1                              |
| 20            | 1         | A/3216-18               | T491A105(1)020A(2)           | 0.5                                 | 4.0                            | 9.0                             | 91                               | 82                       | 36                        | 1                              |
| 20            | 1         | S/3216-12               | T491S105(1)020A(2)           | 0.5                                 | 6.0                            | 18.0                            | 58                               | 52                       | 23                        | 1                              |
| 20            | 1.5       | A/3216-18               | T491A155(1)020A(2)           | 0.5                                 | 6.0                            | 6.5                             | 107                              | 96                       | 43                        | 1                              |
| 20            | 1.5       | S/3216-12               | T491S155(1)020A(2)           | 0.5                                 | 6.0                            | 15.0                            | 63                               | 57                       | 25                        | 1                              |
| 20            | 2.2       | B/3528-21               | T491B225(1)020A(2)           | 0.5                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 20            | 2.2       | A/3216-18               | T491A225(1)020A(2)           | 0.5                                 | 0.6                            | 7.0                             | 104                              | 94                       | 42                        | 1                              |
| 20            | 3.3       | B/3528-21               | T491B335(1)020A(2)           | 0.7                                 | 6.0                            | 3.0                             | 168                              | 151                      | 67                        | 1                              |
| 20            | 3.3       | A/3216-18               | T491A335(1)020A(2)           | 0.7                                 | 6.0                            | 4.5                             | 129                              | 116                      | 52                        | 1                              |
| 20            | 3.3       | T/3528-12               | T491T335(1)020A(2)           | 0.7                                 | 6.0                            | 5.0                             | 118                              | 106                      | 47                        | 1                              |
| 20            | 4.7       | C/6032-28               | T491C475(1)020A(2)           | 0.9                                 | 6.0                            | 2.4                             | 214                              | 193                      | 86                        | 1                              |
| 20            | 4.7       | B/3528-21               | T491B475(1)020A(2)           | 0.9                                 | 6.0                            | 3.0                             | 168                              | 151                      | 67                        | 1                              |
| 20            | 4.7       | A/3216-18               | T491A475(1)020A(2)           | 0.9                                 | 6.0                            | 4.0                             | 137                              | 123                      | 55                        | 1                              |
| 20            | 6.8       | C/6032-28               | T491C685(1)020A(2)           | 1.4                                 | 6.0                            | 1.9                             | 241                              | 217                      | 96                        | 1                              |
| 20            | 6.8       | U/6032-15               | T491U685(1)020A(2)           | 1.4                                 | 6.0                            | 1.9                             | 218                              | 196                      | 87                        | 1                              |
| 20            | 6.8       | B/3528-21               | T491B685(1)020A(2)           | 1.4                                 | 6.0                            | 2.5                             | 184                              | 166                      | 74                        | 1                              |
| 20            | 6.8       | A/3216-18               | T491A685(M)020A(2)           | 1.4                                 | 8.0                            | 6.0                             | 112                              | 101                      | 45                        | 1                              |
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |

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

(2) To complete KEMET part number, insert T = 100% Matte Tin (Sn) Plated, G = Gold Plated, H = Standard Solder coated (SnPb 5% Pb minimum), N = Non-Magnetic 100% Tin (Sn), M = Non-Magnetic (SnPb). Designates Termination Finish.

Refer to Ordering Information for additional detail.

Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitution will be marked with the higher voltage rating. Substitutions can include better than series.

Table 1 – Ratings & Part Number Reference cont'd

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |
|---------------|-----------|-------------------------|------------------------------|-------------------------------------|--------------------------------|---------------------------------|----------------------------------|--------------------------|---------------------------|--------------------------------|
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| 20            | 10        | C/6032-28               | T491C106(1)020A(2)           | 2.0                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 20            | 10        | U/6032-15               | T491U106(1)020A(2)           | 2.0                                 | 6.0                            | 1.8                             | 224                              | 202                      | 90                        | 1                              |
| 20            | 10        | B/3528-21               | T491B106(1)020A(2)           | 2.0                                 | 6.0                            | 2.1                             | 201                              | 181                      | 80                        | 1                              |
| 20            | 10        | A/3216-18               | T491A106(M)020A(2)           | 2.0                                 | 10.0                           | 5.0                             | 122                              | 110                      | 49                        | 1                              |
| 20            | 15        | D/7343-31               | T491D156(1)020A(2)           | 3.0                                 | 6.0                            | 1.0                             | 387                              | 348                      | 155                       | 1                              |
| 20            | 15        | B/3528-21               | T491B156(1)020AT             | 3.0                                 | 6.0                            | 2.5                             | 184                              | 166                      | 74                        | 1                              |
| 20            | 15        | C/6032-28               | T491C156(1)020A(2)           | 3.0                                 | 6.0                            | 1.7                             | 254                              | 229                      | 102                       | 1                              |
| 20            | 22        | D/7343-31               | T491D226(1)020A(2)           | 4.4                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 20            | 22        | V/7343-20               | T491V226(1)020A(2)           | 4.4                                 | 6.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 20            | 22        | C/6032-28               | T491C226(1)020A(2)           | 4.4                                 | 6.0                            | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 20            | 22        | B/3528-21               | T491B226(1)020A(2)           | 4.4                                 | 8.0                            | 4.0                             | 146                              | 131                      | 58                        | 1                              |
| 20            | 33        | D/7343-31               | T491D336(1)020A(2)           | 6.6                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 20            | 33        | C/6032-28               | T491C336(M)020A(2)           | 6.6                                 | 6.0                            | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 20            | 33        | V/7343-20               | T491V336(1)020A(2)           | 6.6                                 | 8.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 20            | 33        | B/3528-21               | T491B336(M)020A(2)           | 6.6                                 | 10.0                           | 4.0                             | 146                              | 131                      | 58                        | 1                              |
| 20            | 47        | C/6032-28               | T491C476(M)020A(2)           | 9.4                                 | 10.0                           | 0.9                             | 350                              | 315                      | 140                       | 1                              |
| 20            | 47        | X/7343-43               | T491X476(1)020AT             | 9.4                                 | 6.0                            | 0.8                             | 454                              | 409                      | 182                       | 1                              |
| 20            | 47        | D/7343-31               | T491D476(1)020A(2)           | 9.4                                 | 6.0                            | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 20            | 68        | X/7343-43               | T491X686(1)020A(2)           | 13.6                                | 6.0                            | 0.7                             | 486                              | 437                      | 194                       | 1                              |
| 20            | 68        | D/7343-31               | T491D686(1)020A(2)           | 13.6                                | 8.0                            | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 20            | 100       | X/7343-43               | T491X107(1)020A(2)           | 20.0                                | 8.0                            | 0.5                             | 574                              | 517                      | 230                       | 1                              |
| 20            | 100       | D/7343-31               | T491D107(1)020AT             | 20.0                                | 8.0                            | 0.9                             | 408                              | 367                      | 163                       | 1                              |
| 20            | 100       | E/7360-38               | T491E107(1)020A(2)           | 20.0                                | 8.0                            | 0.5                             | 632                              | 569                      | 253                       | 1                              |
| 20            | 150       | X/7343-43               | T491X157(1)020A(2)           | 30.0                                | 10.0                           | 0.5                             | 574                              | 517                      | 230                       | 1                              |
| 25            | 0.33      | A/3216-18               | T491A334(1)025A(2)           | 0.5                                 | 4.0                            | 15.0                            | 71                               | 64                       | 28                        | 1                              |
| 25            | 0.47      | A/3216-18               | T491A474(1)025A(2)           | 0.5                                 | 4.0                            | 14.0                            | 73                               | 66                       | 29                        | 1                              |
| 25            | 0.68      | A/3216-18               | T491A684(1)025A(2)           | 0.5                                 | 4.0                            | 10.0                            | 87                               | 78                       | 35                        | 1                              |
| 25            | 1         | B/3528-21               | T491B105(1)025A(2)           | 0.5                                 | 4.0                            | 5.0                             | 130                              | 117                      | 52                        | 1                              |
| 25            | 1         | A/3216-18               | T491A105(1)025A(2)           | 0.5                                 | 4.0                            | 8.0                             | 97                               | 87                       | 39                        | 1                              |
| 25            | 1         | S/3216-12               | T491S105(1)025A(2)           | 0.5                                 | 6.0                            | 18.0                            | 58                               | 52                       | 23                        | 1                              |
| 25            | 1.5       | B/3528-21               | T491B155(1)025A(2)           | 0.5                                 | 6.0                            | 5.0                             | 130                              | 117                      | 52                        | 1                              |
| 25            | 1.5       | A/3216-18               | T491A155(1)025A(2)           | 0.5                                 | 6.0                            | 7.5                             | 100                              | 90                       | 40                        | 1                              |
| 25            | 2.2       | C/6032-28               | T491C225(1)025A(2)           | 0.6                                 | 6.0                            | 3.5                             | 177                              | 159                      | 71                        | 1                              |
| 25            | 2.2       | A/3216-18               | T491A225(1)025A(2)           | 0.6                                 | 6.0                            | 7.0                             | 104                              | 94                       | 42                        | 1                              |
| 25            | 2.2       | B/3528-21               | T491B225(1)025A(2)           | 0.6                                 | 6.0                            | 4.5                             | 137                              | 123                      | 55                        | 1                              |
| 25            | 3.3       | C/6032-28               | T491C335(1)025A(2)           | 0.8                                 | 6.0                            | 2.5                             | 210                              | 189                      | 84                        | 1                              |
| 25            | 3.3       | A/3216-18               | T491A335(1)025A(2)           | 0.8                                 | 6.0                            | 7.0                             | 104                              | 94                       | 42                        | 1                              |
| 25            | 3.3       | B/3528-21               | T491B335(1)025A(2)           | 0.8                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 25            | 4.7       | C/6032-28               | T491C475(1)025A(2)           | 1.2                                 | 6.0                            | 2.4                             | 214                              | 193                      | 86                        | 1                              |
| 25            | 4.7       | B/3528-21               | T491B475(1)025A(2)           | 1.2                                 | 6.0                            | 1.5                             | 238                              | 214                      | 95                        | 1                              |
| 25            | 4.7       | A/3216-18               | T491A475(M)025A(2)           | 1.2                                 | 8.0                            | 6.0                             | 112                              | 101                      | 45                        | 1                              |
| 25            | 6.8       | C/6032-28               | T491C685(1)025A(2)           | 1.7                                 | 6.0                            | 1.9                             | 241                              | 217                      | 96                        | 1                              |
| 25            | 6.8       | B/3528-21               | T491B685(1)025A(2)           | 1.7                                 | 8.0                            | 2.8                             | 174                              | 157                      | 70                        | 1                              |
| 25            | 10        | D/7343-31               | T491D106(1)025A(2)           | 2.5                                 | 6.0                            | 1.0                             | 387                              | 348                      | 155                       | 1                              |
| 25            | 10        | C/6032-28               | T491C106(1)025A(2)           | 2.5                                 | 6.0                            | 1.5                             | 271                              | 244                      | 108                       | 1                              |
| 25            | 10        | B/3528-21               | T491B106(1)025A(2)           | 2.5                                 | 8.0                            | 3.0                             | 168                              | 151                      | 67                        | 1                              |
| 25            | 15        | D/7343-31               | T491D156(1)025A(2)           | 3.8                                 | 6.0                            | 1.0                             | 387                              | 348                      | 155                       | 1                              |
| 25            | 15        | V/7343-20               | T491V156(1)025AT             | 3.8                                 | 6.0                            | 1.0                             | 354                              | 319                      | 142                       | 1                              |
| 25            | 15        | C/6032-28               | T491C156(1)025A(2)           | 3.8                                 | 6.0                            | 1.5                             | 271                              | 244                      | 108                       | 1                              |
| 25            | 15        | B/3528-21               | T491B156(1)025A(2)           | 3.8                                 | 8.0                            | 4.0                             | 146                              | 131                      | 58                        | 1                              |
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |

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

(2) To complete KEMET part number, insert T = 100% Matte Tin (Sn) Plated, G = Gold Plated, H = Standard Solder coated (SnPb 5% Pb minimum), N = Non-Magnetic 100% Tin (Sn), M = Non-Magnetic (SnPb). Designates Termination Finish.

Refer to Ordering Information for additional detail.

Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitution will be marked with the higher voltage rating. Substitutions can include better than series.

Table 1 – Ratings & Part Number Reference cont'd

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |
|---------------|-----------|-------------------------|------------------------------|-------------------------------------|--------------------------------|---------------------------------|----------------------------------|--------------------------|---------------------------|--------------------------------|
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| 25            | 22        | D/7343-31               | T491D226(1)025A(2)           | 5.5                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 25            | 22        | C/6032-28               | T491C226(1)025A(2)           | 5.5                                 | 6.0                            | 1.4                             | 280                              | 252                      | 112                       | 1                              |
| 25            | 22        | V/7343-20               | T491V226(1)025A(2)           | 5.5                                 | 6.0                            | 0.7                             | 423                              | 381                      | 169                       | 1                              |
| 25            | 33        | X/7343-43               | T491X336(1)025A(2)           | 8.3                                 | 6.0                            | 0.7                             | 486                              | 437                      | 194                       | 1                              |
| 25            | 33        | D/7343-31               | T491D336(1)025A(2)           | 8.3                                 | 6.0                            | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 25            | 33        | C/6032-28               | T491C336(1)025A(2)           | 8.3                                 | 10.0                           | 1.2                             | 303                              | 273                      | 121                       | 1                              |
| 25            | 47        | X/7343-43               | T491X476(1)025A(2)           | 11.8                                | 6.0                            | 0.7                             | 486                              | 437                      | 194                       | 1                              |
| 25            | 47        | D/7343-31               | T491D476(1)025A(2)           | 11.8                                | 10.0                           | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 25            | 68        | X/7343-43               | T491X686(M)025A(2)           | 17.0                                | 8.0                            | 0.7                             | 486                              | 437                      | 194                       | 1                              |
| 25            | 68        | D/7343-31               | T491D686(M)025A(2)           | 17.0                                | 10.0                           | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 25            | 100       | X/7343-43               | T491X107(1)025A(2)           | 25.0                                | 8.0                            | 0.3                             | 742                              | 668                      | 297                       | 1                              |
| 35            | 0.1       | A/3216-18               | T491A104(1)035A(2)           | 0.5                                 | 4.0                            | 20.0                            | 61                               | 55                       | 24                        | 1                              |
| 35            | 0.15      | A/3216-18               | T491A154(1)035A(2)           | 0.5                                 | 4.0                            | 19.0                            | 63                               | 57                       | 25                        | 1                              |
| 35            | 0.22      | A/3216-18               | T491A224(1)035A(2)           | 0.5                                 | 4.0                            | 18.0                            | 65                               | 59                       | 26                        | 1                              |
| 35            | 0.33      | A/3216-18               | T491A334(1)035A(2)           | 0.5                                 | 4.0                            | 15.0                            | 71                               | 64                       | 28                        | 1                              |
| 35            | 0.47      | B/3528-21               | T491B474(1)035A(2)           | 0.5                                 | 4.0                            | 8.0                             | 103                              | 93                       | 41                        | 1                              |
| 35            | 0.47      | A/3216-18               | T491A474(1)035A(2)           | 0.5                                 | 4.0                            | 12.0                            | 79                               | 71                       | 32                        | 1                              |
| 35            | 0.68      | B/3528-21               | T491B684(1)035A(2)           | 0.5                                 | 4.0                            | 6.5                             | 114                              | 103                      | 46                        | 1                              |
| 35            | 0.68      | A/3216-18               | T491A684(1)035A(2)           | 0.5                                 | 4.0                            | 8.0                             | 97                               | 87                       | 39                        | 1                              |
| 35            | 1         | B/3528-21               | T491B105(1)035A(2)           | 0.5                                 | 4.0                            | 5.0                             | 130                              | 117                      | 52                        | 1                              |
| 35            | 1         | A/3216-18               | T491A105(1)035A(2)           | 0.5                                 | 4.0                            | 7.5                             | 100                              | 90                       | 40                        | 1                              |
| 35            | 1.5       | A/3216-18               | T491A155(1)035A(2)           | 0.5                                 | 6.0                            | 7.0                             | 104                              | 94                       | 42                        | 1                              |
| 35            | 1.5       | C/6032-28               | T491C155(1)035A(2)           | 0.5                                 | 6.0                            | 4.5                             | 156                              | 140                      | 62                        | 1                              |
| 35            | 1.5       | B/3528-21               | T491B155(1)035A(2)           | 0.5                                 | 6.0                            | 5.0                             | 130                              | 117                      | 52                        | 1                              |
| 35            | 2.2       | C/6032-28               | T491C225(1)035A(2)           | 0.8                                 | 6.0                            | 3.5                             | 177                              | 159                      | 71                        | 1                              |
| 35            | 2.2       | A/3216-18               | T491A225(1)035AT             | 0.8                                 | 6.0                            | 4.5                             | 129                              | 116                      | 52                        | 1                              |
| 35            | 2.2       | B/3528-21               | T491B225(1)035A(2)           | 0.8                                 | 6.0                            | 4.0                             | 146                              | 131                      | 58                        | 1                              |
| 35            | 3.3       | C/6032-28               | T491C335(1)035A(2)           | 1.2                                 | 6.0                            | 2.5                             | 210                              | 189                      | 84                        | 1                              |
| 35            | 3.3       | B/3528-21               | T491B335(1)035A(2)           | 1.2                                 | 6.0                            | 3.5                             | 156                              | 140                      | 62                        | 1                              |
| 35            | 4.7       | D/7343-31               | T491D475(1)035A(2)           | 1.6                                 | 6.0                            | 1.5                             | 316                              | 284                      | 126                       | 1                              |
| 35            | 4.7       | B/3528-21               | T491B475(1)035AT             | 1.6                                 | 6.0                            | 3.1                             | 166                              | 149                      | 66                        | 1                              |
| 35            | 4.7       | C/6032-28               | T491C475(1)035A(2)           | 1.6                                 | 6.0                            | 2.2                             | 224                              | 202                      | 90                        | 1                              |
| 35            | 6.8       | D/7343-31               | T491D685(1)035A(2)           | 2.4                                 | 6.0                            | 1.3                             | 340                              | 306                      | 136                       | 1                              |
| 35            | 6.8       | V/7343-20               | T491V685(1)035AT             | 2.4                                 | 6.0                            | 1.2                             | 323                              | 291                      | 129                       | 1                              |
| 35            | 6.8       | C/6032-28               | T491C685(1)035A(2)           | 2.4                                 | 6.0                            | 1.8                             | 247                              | 222                      | 99                        | 1                              |
| 35            | 10        | D/7343-31               | T491D106(1)035A(2)           | 3.5                                 | 6.0                            | 1.0                             | 387                              | 348                      | 155                       | 1                              |
| 35            | 10        | C/6032-28               | T491C106(M)035A(2)           | 3.5                                 | 6.0                            | 1.6                             | 262                              | 236                      | 105                       | 1                              |
| 35            | 10        | V/7343-20               | T491V106(1)035A(2)           | 3.5                                 | 6.0                            | 2.0                             | 250                              | 225                      | 100                       | 1                              |
| 35            | 15        | X/7343-43               | T491X156(1)035A(2)           | 5.3                                 | 6.0                            | 0.9                             | 428                              | 385                      | 171                       | 1                              |
| 35            | 15        | D/7343-31               | T491D156(1)035A(2)           | 5.3                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 35            | 22        | X/7343-43               | T491X226(1)035A(2)           | 7.7                                 | 6.0                            | 0.7                             | 486                              | 437                      | 194                       | 1                              |
| 35            | 22        | D/7343-31               | T491D226(1)035A(2)           | 7.7                                 | 6.0                            | 0.7                             | 463                              | 417                      | 185                       | 1                              |
| 35            | 33        | X/7343-43               | T491X336(1)035A(2)           | 11.6                                | 6.0                            | 0.6                             | 524                              | 472                      | 210                       | 1                              |
| 35            | 47        | X/7343-43               | T491X476(1)035A(2)           | 16.5                                | 8.0                            | 0.6                             | 524                              | 472                      | 210                       | 1                              |
| 35            | 47        | E/7360-38               | T491E476(1)035A(2)           | 16.5                                | 10.0                           | 0.5                             | 632                              | 569                      | 253                       | 1                              |
| 50            | 0.1       | A/3216-18               | T491A104(1)050A(2)           | 0.5                                 | 4.0                            | 20.0                            | 61                               | 55                       | 24                        | 1                              |
| 50            | 0.15      | B/3528-21               | T491B154(1)050A(2)           | 0.5                                 | 4.0                            | 16.0                            | 73                               | 66                       | 29                        | 1                              |
| 50            | 0.15      | A/3216-18               | T491A154(1)050A(2)           | 0.5                                 | 4.0                            | 15.0                            | 71                               | 64                       | 28                        | 1                              |
| 50            | 0.22      | B/3528-21               | T491B224(1)050A(2)           | 0.5                                 | 4.0                            | 14.0                            | 78                               | 70                       | 31                        | 1                              |
| 50            | 0.22      | A/3216-18               | T491A224(1)050AT             | 0.5                                 | 4.0                            | 18.0                            | 65                               | 59                       | 26                        | 1                              |
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |

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

(2) To complete KEMET part number, insert T = 100% Matte Tin (Sn) Plated, G = Gold Plated, H = Standard Solder coated (SnPb 5% Pb minimum), N = Non-Magnetic 100% Tin (Sn), M = Non-Magnetic (SnPb). Designates Termination Finish.

Refer to Ordering Information for additional detail.

Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitution will be marked with the higher voltage rating. Substitutions can include better than series.

Table 1 – Ratings & Part Number Reference cont'd

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |
|---------------|-----------|-------------------------|------------------------------|-------------------------------------|--------------------------------|---------------------------------|----------------------------------|--------------------------|---------------------------|--------------------------------|
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| 50            | 0.33      | A/3216-18               | T491A334(1)050A(2)           | 0.5                                 | 4.0                            | 14.0                            | 73                               | 66                       | 29                        | 1                              |
| 50            | 0.33      | B/3528-21               | T491B334(1)050A(2)           | 0.5                                 | 4.0                            | 10.0                            | 92                               | 83                       | 37                        | 1                              |
| 50            | 0.47      | A/3216-18               | T491A474(1)050A(2)           | 0.5                                 | 4.0                            | 9.5                             | 280                              | 253                      | 112                       | 1                              |
| 50            | 0.47      | C/6032-28               | T491C474(1)050A(2)           | 0.5                                 | 4.0                            | 8.0                             | 117                              | 105                      | 47                        | 1                              |
| 50            | 0.47      | B/3528-21               | T491B474(1)050A(2)           | 0.5                                 | 4.0                            | 9.0                             | 97                               | 87                       | 39                        | 1                              |
| 50            | 0.68      | A/3216-18               | T491A684(1)050A(2)           | 0.5                                 | 4.0                            | 8.0                             | 97                               | 87                       | 39                        | 1                              |
| 50            | 0.68      | C/6032-28               | T491C684(1)050A(2)           | 0.5                                 | 4.0                            | 7.0                             | 125                              | 113                      | 50                        | 1                              |
| 50            | 0.68      | B/3528-21               | T491B684(1)050A(2)           | 0.5                                 | 4.0                            | 8.0                             | 103                              | 93                       | 41                        | 1                              |
| 50            | 1         | A/3216-18               | T491A105(1)050A(2)           | 0.5                                 | 4.0                            | 7.0                             | 104                              | 94                       | 42                        | 1                              |
| 50            | 1         | C/6032-28               | T491C105(1)050A(2)           | 0.5                                 | 4.0                            | 5.5                             | 141                              | 127                      | 56                        | 1                              |
| 50            | 1         | B/3528-21               | T491B105(1)050A(2)           | 0.5                                 | 6.0                            | 6.0                             | 119                              | 107                      | 48                        | 1                              |
| 50            | 1         | V/7343-20               | T491V105(1)050A(2)           | 0.5                                 | 4.0                            | 6.0                             | 144                              | 130                      | 58                        | 1                              |
| 50            | 1.5       | D/7343-31               | T491D155(1)050A(2)           | 0.8                                 | 6.0                            | 3.5                             | 207                              | 186                      | 83                        | 1                              |
| 50            | 1.5       | C/6032-28               | T491C155(1)050A(2)           | 0.8                                 | 6.0                            | 4.5                             | 156                              | 140                      | 62                        | 1                              |
| 50            | 2.2       | D/7343-31               | T491D225(1)050A(2)           | 1.1                                 | 6.0                            | 2.5                             | 245                              | 221                      | 98                        | 1                              |
| 50            | 2.2       | C/6032-28               | T491C225(1)050A(2)           | 1.1                                 | 6.0                            | 3.0                             | 191                              | 172                      | 76                        | 1                              |
| 50            | 3.3       | C/6032-28               | T491C335(1)050AT             | 1.7                                 | 6.0                            | 2.5                             | 210                              | 189                      | 84                        | 1                              |
| 50            | 3.3       | D/7343-31               | T491D335(1)050A(2)           | 1.7                                 | 6.0                            | 2.0                             | 274                              | 247                      | 110                       | 1                              |
| 50            | 4.7       | D/7343-31               | T491D475(1)050A(2)           | 2.4                                 | 6.0                            | 1.4                             | 327                              | 294                      | 131                       | 1                              |
| 50            | 6.8       | X/7343-43               | T491X685(1)050A(2)           | 3.4                                 | 6.0                            | 1.0                             | 406                              | 365                      | 162                       | 1                              |
| 50            | 6.8       | D/7343-31               | T491D685(1)050A(2)           | 3.4                                 | 6.0                            | 1.0                             | 387                              | 348                      | 155                       | 1                              |
| 50            | 10        | X/7343-43               | T491X106(M)050A(2)           | 5.0                                 | 6.0                            | 0.7                             | 486                              | 437                      | 194                       | 1                              |
| 50            | 10        | D/7343-31               | T491D106(1)050A(2)           | 5.0                                 | 6.0                            | 0.8                             | 433                              | 390                      | 173                       | 1                              |
| 50            | 15        | X/7343-43               | T491X156(1)050A(2)           | 7.5                                 | 8.0                            | 0.7                             | 486                              | 437                      | 194                       | 1                              |
| 50            | 22        | X/7343-43               | T491X226(1)050A(2)           | 11.0                                | 10.0                           | 0.6                             | 524                              | 472                      | 210                       | 1                              |
| VDC           | μF        | KEMET/EIA               | (See below for part options) | μA @ +20°C<br>Maximum/<br>5 Minutes | % @ +20°C<br>120 Hz<br>Maximum | Ω @ +20°C<br>100 kHz<br>Maximum | (mA)<br>100 kHz<br>25°C          | (mA)<br>100 kHz<br>+85°C | (mA)<br>100 kHz<br>+125°C | Reflow Temperature<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                          | DF                             | ESR                             | Maximum Allowable Ripple Current |                          |                           | Moisture Sensitivity           |

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

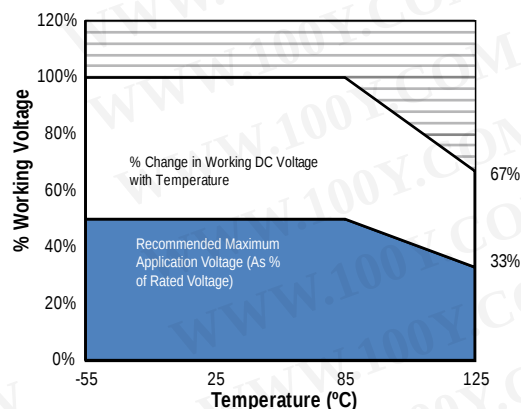
(2) To complete KEMET part number, insert T = 100% Matte Tin (Sn) Plated, G = Gold Plated, H = Standard Solder coated (SnPb 5% Pb minimum), N = Non-Magnetic 100% Tin (Sn), M = Non-Magnetic (SnPb). Designates Termination Finish.

Refer to Ordering Information for additional detail.

Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitution will be marked with the higher voltage rating. Substitutions can include better than series.

## Recommended Voltage Derating Guidelines

|                                                 | -55°C to 85°C | 85°C to 125°C |
|-------------------------------------------------|---------------|---------------|
| % Change in Working DC Voltage with Temperature | $V_R$         | 67% of $V_R$  |
| Recommended Maximum Application Voltage         | 50% of $V_R$  | 33% of $V_R$  |



## Ripple Current/Ripple Voltage

| KEMET Series and Case Code | EIA Case Code | Maximum Power Dissipation (P max) mWatts @ 25°C w/+20°C Rise |
|----------------------------|---------------|--------------------------------------------------------------|
| A                          | 3216-18       | 75                                                           |
| B                          | 3528-21       | 85                                                           |
| C                          | 6032-28       | 110                                                          |
| D                          | 7343-31       | 150                                                          |
| X                          | 7343-43       | 165                                                          |
| E                          | 7360-38       | 200                                                          |
| T428P                      | 7360-38       | 325                                                          |
| S                          | 3216-12       | 60                                                           |
| T                          | 3528-12       | 70                                                           |
| U                          | 6032-15       | 90                                                           |
| V                          | 7343-20       | 125                                                          |
| T510X                      | 7343-43       | 270                                                          |
| T510E                      | 7360-38       | 285                                                          |

| Temperature Compensation Multipliers for Maximum Power Dissipation |      |       |
|--------------------------------------------------------------------|------|-------|
| ≤ 25°C                                                             | 85°C | 125°C |
| 1.00                                                               | 0.90 | 0.40  |

$T$  = Environmental Temperature

Using the P max of the device, the maximum allowable rms ripple current or voltage may be determined.

$$I(max) = \sqrt{P_{max}/R}$$

$$E(max) = \sqrt{P_{max} \cdot R}$$

$I$  = rms ripple current (amperes)

$E$  = rms ripple voltage (volts)

$P_{max}$  = maximum power dissipation (watts)

$R$  = ESR at specified frequency (ohms)

## Reverse Voltage

Solid tantalum capacitors are polar 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 plus in some cases a beveled edge. A small degree of transient reverse voltage is permissible for short periods per the table. The capacitors should not be operated continuously in reverse mode, even within these limits.

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

**Table 2 – Land Dimensions/Courtyard**

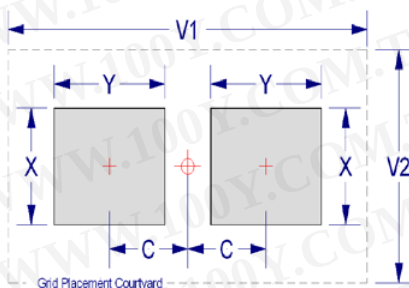
| KEMET          | Metric Size Code | Density Level A:<br>Maximum (Most) Land Protrusion (mm) |      |      |       |      | Density Level B:<br>Median (Nominal) Land Protrusion (mm) |      |      |      |      | Density Level C:<br>Minimum (Least) Land Protrusion (mm) |      |      |      |      |
|----------------|------------------|---------------------------------------------------------|------|------|-------|------|-----------------------------------------------------------|------|------|------|------|----------------------------------------------------------|------|------|------|------|
| Case           | EIA              | X                                                       | Y    | C    | V1    | V2   | X                                                         | Y    | C    | V1   | V2   | X                                                        | Y    | C    | V1   | V2   |
| A              | 3216-18          | 1.35                                                    | 2.15 | 1.45 | 6.10  | 2.80 | 1.25                                                      | 1.75 | 1.35 | 5.00 | 2.30 | 1.15                                                     | 1.35 | 1.25 | 4.10 | 2.00 |
| B              | 3528-21          | 2.35                                                    | 2.15 | 1.45 | 6.10  | 4.00 | 2.25                                                      | 1.75 | 1.35 | 5.00 | 3.50 | 2.15                                                     | 1.35 | 1.25 | 4.10 | 3.20 |
| C              | 6032-28          | 2.35                                                    | 2.65 | 2.60 | 8.90  | 4.40 | 2.25                                                      | 2.25 | 2.50 | 7.80 | 3.90 | 2.15                                                     | 1.85 | 2.40 | 6.90 | 3.60 |
| D              | 7343-31          | 2.55                                                    | 3.75 | 2.70 | 10.20 | 5.50 | 2.45                                                      | 3.35 | 2.60 | 9.10 | 5.00 | 2.35                                                     | 2.95 | 2.50 | 8.20 | 4.70 |
| E <sup>1</sup> | 7360-38          | 4.25                                                    | 2.65 | 3.20 | 10.10 | 7.20 | 4.15                                                      | 2.25 | 3.30 | 9.40 | 6.70 | 4.05                                                     | 1.85 | 3.00 | 8.10 | 6.40 |
| S              | 3216-12          | 1.35                                                    | 2.15 | 1.45 | 6.10  | 2.80 | 1.25                                                      | 1.75 | 1.35 | 5.00 | 2.30 | 1.15                                                     | 1.35 | 1.25 | 4.10 | 2.00 |
| T              | 3528-12          | 2.35                                                    | 2.15 | 1.45 | 6.10  | 4.00 | 2.25                                                      | 1.75 | 1.35 | 5.00 | 3.50 | 2.15                                                     | 1.35 | 1.25 | 4.10 | 3.20 |
| U              | 6032-15          | 2.35                                                    | 2.65 | 2.60 | 8.90  | 4.40 | 2.25                                                      | 2.25 | 2.50 | 7.80 | 3.90 | 2.15                                                     | 1.85 | 2.40 | 6.90 | 3.60 |
| V              | 7343-20          | 2.55                                                    | 3.75 | 2.70 | 10.20 | 5.50 | 2.45                                                      | 3.35 | 2.60 | 9.10 | 5.00 | 2.35                                                     | 2.95 | 2.50 | 8.20 | 4.70 |
| X <sup>1</sup> | 7343-43          | 2.55                                                    | 3.75 | 2.70 | 10.20 | 5.50 | 2.45                                                      | 3.35 | 2.60 | 9.10 | 5.00 | 2.35                                                     | 2.95 | 2.50 | 8.20 | 4.70 |

**Density Level A:** For low-density product applications. Recommended for wave solder applications and provides a wider process window for reflow solder processes.

**Density Level B:** For products with a moderate level of component density. Provides a robust solder attachment condition for reflow solder processes.

**Density Level C:** For high component density product applications. Before adapting the minimum land pattern variations the user should perform qualification testing based on the conditions outlined in IPC Standard 7351 (IPC-7351).

<sup>1</sup> Height of these chips may create problems in wave soldering.



## Soldering Process

KEMET's families of surface mount capacitors are compatible with wave (single or dual), convection, IR, or vapor phase reflow techniques. Preheating of these components is recommended to avoid extreme thermal stress. KEMET's recommended profile conditions for convection and IR reflow reflect the profile conditions of the IPC/J-STD-020D standard for moisture sensitivity testing. The devices can safely withstand a maximum of three reflow passes at these conditions.

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

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. Once reflow occurs, the iron should be removed immediately. "Wiping" the edges of a chip and heating the top surface is not recommended.

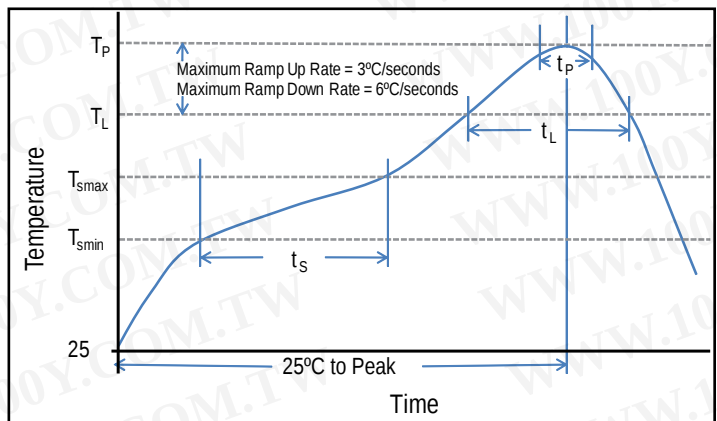
During typical reflow operations, a slight darkening of the gold-colored epoxy may be observed. This slight darkening is normal and not harmful to the product. Marking permanency is not affected by this change.

| Profile Feature                                       | SnPb Assembly       | Pb-Free Assembly    |
|-------------------------------------------------------|---------------------|---------------------|
| Preheat/Soak                                          |                     |                     |
| Temperature Minimum ( $T_{Smin}$ )                    | 100°C               | 150°C               |
| Temperature Maximum ( $T_{Smax}$ )                    | 150°C               | 200°C               |
| Time ( $t_s$ ) from $T_{Smin}$ to $T_{Smax}$          | 60 – 120 seconds    | 60 – 120 seconds    |
| Ramp-up Rate ( $T_L$ to $T_P$ )                       | 3°C/seconds maximum | 3°C/seconds maximum |
| Liquidous Temperature ( $T_L$ )                       | 183°C               | 217°C               |
| Time Above Liquidous ( $t_L$ )                        | 60 – 150 seconds    | 60 – 150 seconds    |
| Peak Temperature ( $T_P$ )                            | 220°C*<br>235°C**   | 250°C*<br>260°C**   |
| Time within 5°C of Maximum Peak Temperature ( $t_p$ ) | 20 seconds maximum  | 30 seconds maximum  |
| Ramp-down Rate ( $T_P$ to $T_L$ )                     | 6°C/seconds maximum | 6°C/seconds maximum |
| Time 25°C to Peak Temperature                         | 6 minutes maximum   | 8 minutes maximum   |

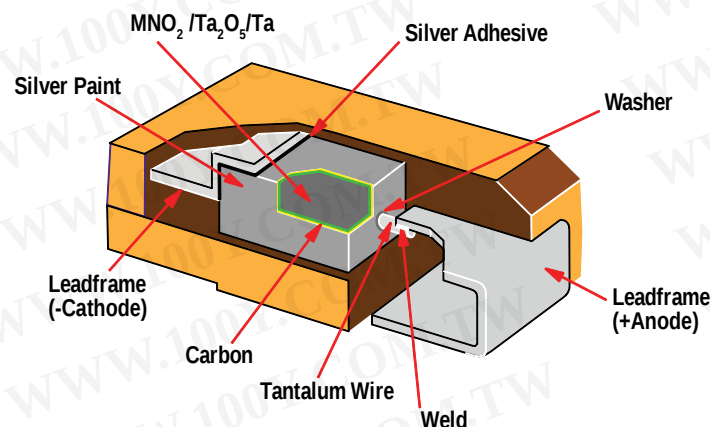
Note: All temperatures refer to the center of the package, measured on the package body surface that is facing up during assembly reflow.

\*Case Size D, E, P, Y, and X

\*\*Case Size A, B, C, H, I, K, M, R, S, T, U, V, W, and Z



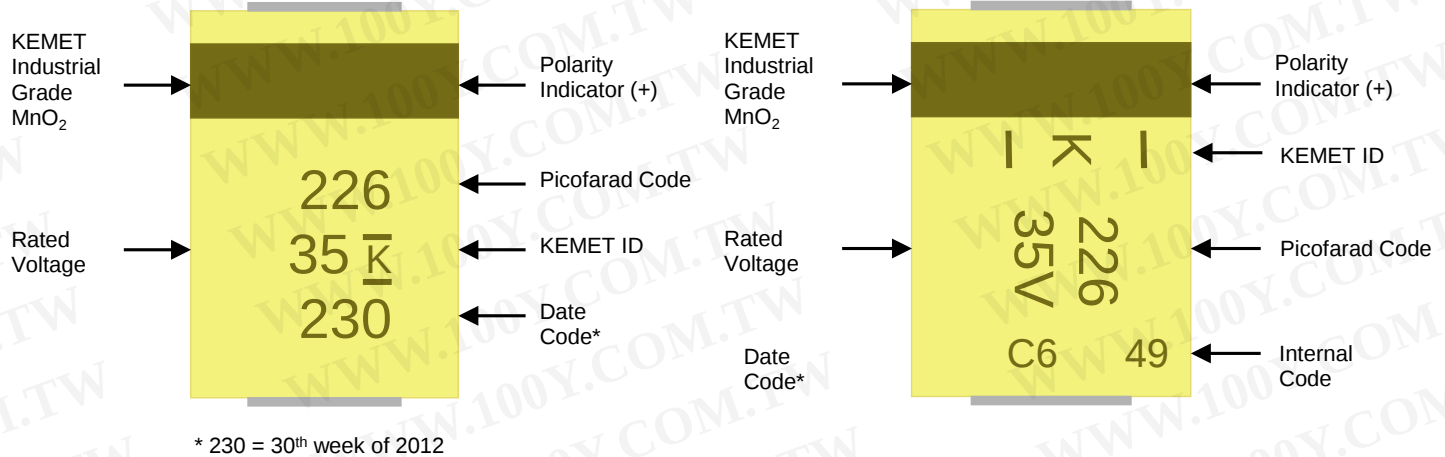
## Construction



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## Capacitor Marking

### C, D, X Case Sizes



#### Date Code \*

|                                                              |                                                                                    |
|--------------------------------------------------------------|------------------------------------------------------------------------------------|
| 1 <sup>st</sup> digit = Last number of Year                  | 9 = 2009<br>0 = 2010<br>1 = 2011<br>2 = 2012<br>3 = 2013<br>4 = 2014               |
| 2 <sup>nd</sup> and 3 <sup>rd</sup> digit = Week of the Year | 01 = 1 <sup>st</sup> week of the Year to<br>52 = 52 <sup>nd</sup> week of the Year |

#### Date Code\*

| Year     | Month   |          |
|----------|---------|----------|
| X = 2009 | 1 = Jan | 7 = Jul  |
| A = 2010 | 2 = Feb | 8 = Aug  |
| B = 2011 | 3 = Mar | 9 = Sept |
| C = 2012 | 4 = Apr | O = Oct  |
| D = 2013 | 5 = May | N = Nov  |
| E = 2014 | 6 = Jun | D = Dec  |

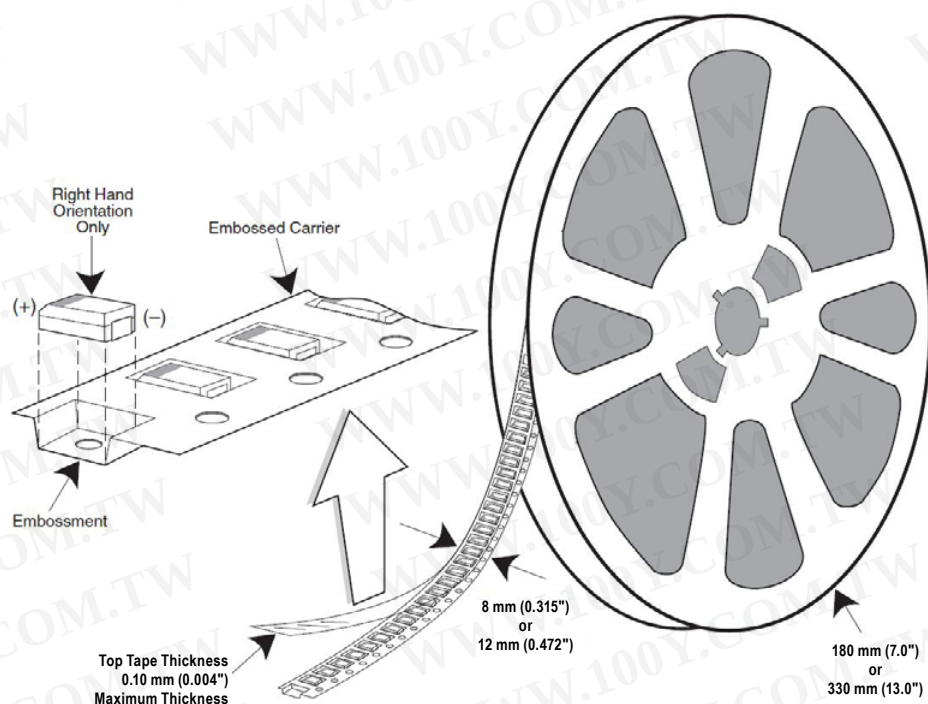
## Storage

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°C and maximum storage humidity not exceed 60% relative humidity. Temperature fluctuations should be minimized to avoid condensation on the parts and atmospheres should be free of chlorine and sulphur bearing compounds. For optimized solderability chip stock should be used promptly, preferably within three years of receipt.

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## Tape & Reel Packaging Information

KEMET's molded tantalum and aluminum chip capacitor families are packaged in 8 and 12 mm plastic tape on 7" and 13" reels in accordance with *EIA Standard 481-1: Embossed Carrier Taping of Surface Mount Components for Automatic Handling*. This packaging system is compatible with all tape-fed automatic pick-and-place systems.



**Table 3 – Packaging Quantity**

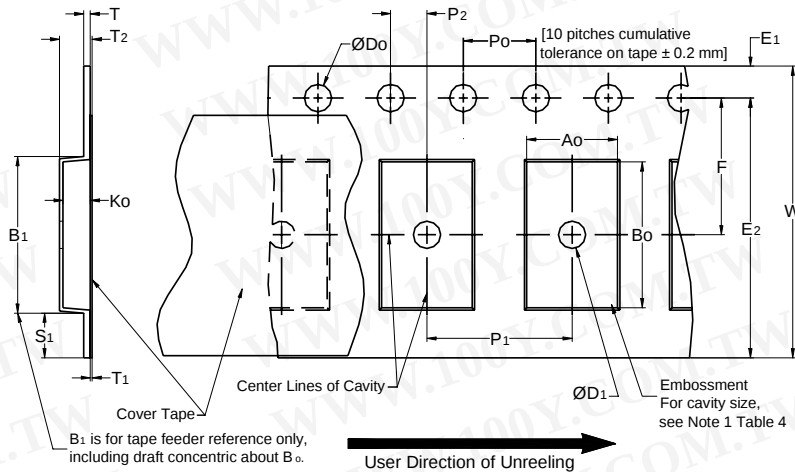
| Case Code |         | Tape Width (mm) | 7" Reel* | 13" Reel* |
|-----------|---------|-----------------|----------|-----------|
| KEMET     | EIA     |                 |          |           |
| I         | 3216-10 | 8               | 3,000    | 12,000    |
| S         | 3216-12 | 8               | 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/T428P   | 7360-38 | 12              | 500      | 2,000     |
| H         | 7360-20 | 12              | 1,000    | 2,500     |

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

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**Figure 1 – Embossed (Plastic) Carrier Tape Dimensions**

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**Table 4 – Embossed (Plastic) Carrier Tape Dimensions**

Metric will govern

| Constant Dimensions — Millimeters (Inches) |                                       |                                  |                              |                             |                             |                        |                                  |                                                 |                        |
|--------------------------------------------|---------------------------------------|----------------------------------|------------------------------|-----------------------------|-----------------------------|------------------------|----------------------------------|-------------------------------------------------|------------------------|
| Tape Size                                  | D <sub>0</sub>                        | D <sub>1</sub> Minimum<br>Note 1 | E <sub>1</sub>               | P <sub>0</sub>              | P <sub>2</sub>              | R Reference<br>Note 2  | S <sub>1</sub> Minimum<br>Note 3 | T Maximum                                       | T <sub>1</sub> Maximum |
| 8 mm                                       | 1.5 +0.10/-0.0<br>(0.059 +0.004/-0.0) | 1.0<br>(0.039)                   | 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) | 25.0<br>(0.984)        | 0.600<br>(0.024)                 | 0.600<br>(0.024)                                | 0.100<br>(0.004)       |
| 12 mm                                      |                                       | 1.5<br>(0.059)                   |                              |                             |                             | 30<br>(1.181)          |                                  |                                                 |                        |
| 16 mm                                      |                                       |                                  |                              |                             |                             |                        |                                  |                                                 |                        |
| Variable Dimensions — Millimeters (Inches) |                                       |                                  |                              |                             |                             |                        |                                  |                                                 |                        |
| Tape Size                                  | Pitch                                 | B <sub>1</sub> Maximum<br>Note 4 | E <sub>2</sub> Minimum       | F                           | P <sub>1</sub>              | T <sub>2</sub> Maximum | W Maximum                        | A <sub>0</sub> ,B <sub>0</sub> & K <sub>0</sub> |                        |
| 8 mm                                       | Single (4 mm)                         | 4.35<br>(0.171)                  | 6.25<br>(0.246)              | 3.5 ±0.05<br>(0.138 ±0.002) | 4.0 ±0.10<br>(0.157 ±0.004) | 2.5<br>(0.098)         | 8.3<br>(0.327)                   | Note 5                                          |                        |
| 12 mm                                      | Single (4 mm) &<br>Double (8 mm)      | 8.2<br>(0.323)                   | 10.25<br>(0.404)             | 5.5 ±0.05<br>(0.217 ±0.002) | 8.0 ±0.10<br>(0.315 ±0.004) | 4.6<br>(0.181)         | 12.3<br>(0.484)                  |                                                 |                        |
| 16 mm                                      | Triple (12 mm)                        | 12.1<br>(0.476)                  | 14.25<br>(0.561)             | 5.5 ±0.05<br>(0.217 ±0.002) | 8.0 ±0.10<br>(0.315 ±0.004) | 4.6<br>(0.181)         | 16.3<br>(0.642)                  |                                                 |                        |

- 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.
- The tape, with or without components, shall pass around R without damage (see Figure 5).
- If S<sub>1</sub> < 1.0 mm, there may not be enough area for cover tape to be properly applied (see EIA Standard 481–D, paragraph 4.3, section b).
- B<sub>1</sub> dimension is a reference dimension for tape feeder clearance only.
- The cavity defined by A<sub>0</sub>, B<sub>0</sub> and K<sub>0</sub> shall surround the component with sufficient clearance that:
  - the component does not protrude above the top surface of the carrier tape.
  - the component can be removed from the cavity in a vertical direction without mechanical restriction, after the top cover tape has been removed.
  - rotation of the component is limited to 20° maximum for 8 and 12 mm tapes and 10° maximum for 16 mm tapes (see Figure 2).
  - lateral movement of the component is restricted to 0.5 mm maximum for 8 mm and 12 mm wide tape and to 1.0 mm maximum for 16 mm tape (see Figure 3).
  - see Addendum in EIA Standard 481–D for standards relating to more precise taping requirements.

## 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:

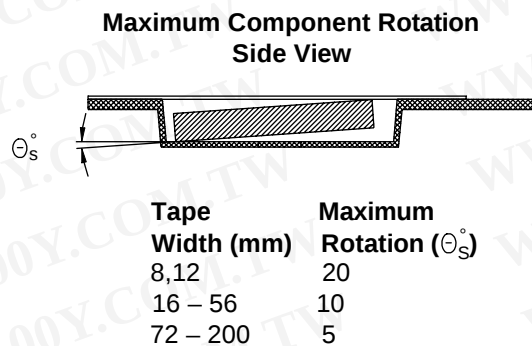
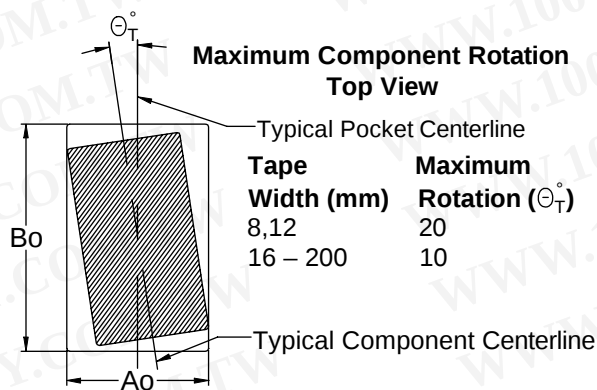
| Tape Width   | Peel Strength                    |
|--------------|----------------------------------|
| 8 mm         | 0.1 to 1.0 Newton (10 to 100 gf) |
| 12 and 16 mm | 0.1 to 1.3 Newton (10 to 130 gf) |

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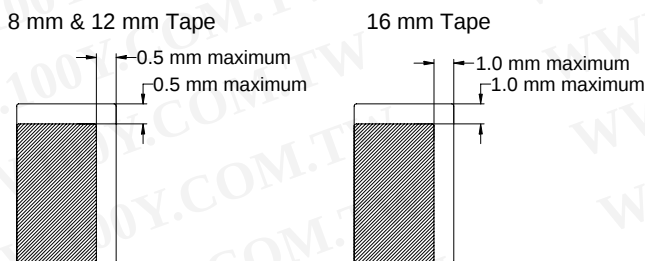
The direction of the pull shall be opposite the direction of the carrier tape travel. The pull angle of the carrier tape shall be 165° to 180° from the plane of the carrier tape. During peeling, the carrier and/or cover tape shall be pulled at a velocity of 300 ±10 mm/minute.

- Labeling:** Bar code labeling (standard or custom) shall be on the side of the reel opposite the sprocket holes. Refer to EIA Standards 556 and 624.

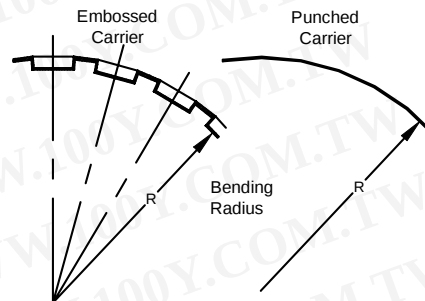
### Figure 2 – Maximum Component Rotation



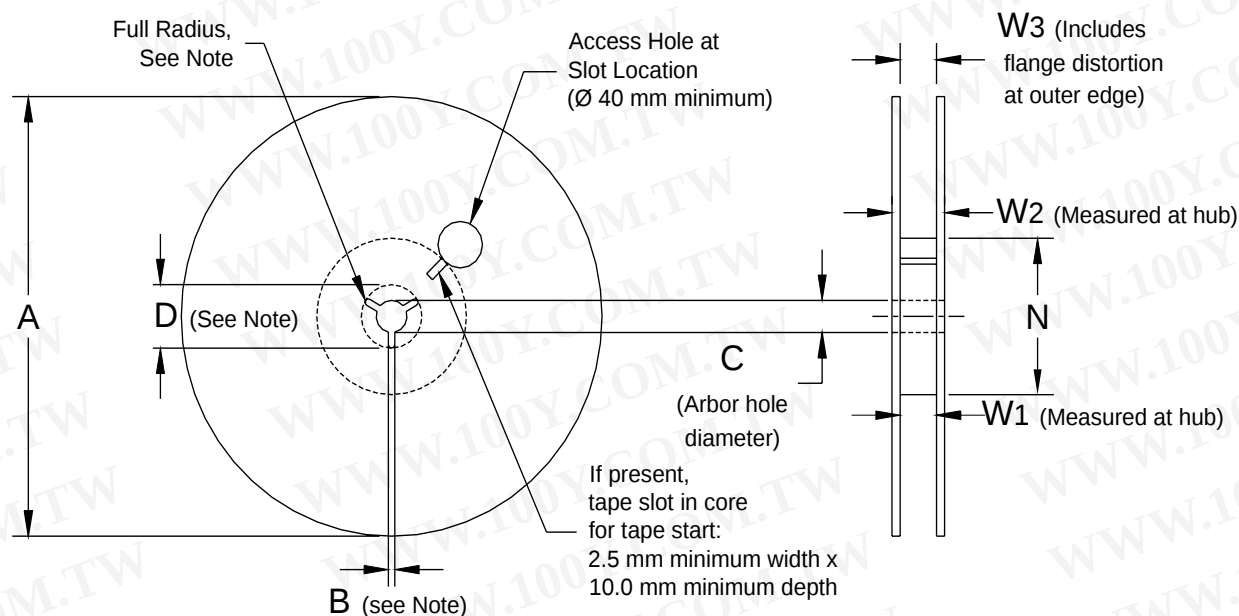
### Figure 3 – Maximum Lateral Movement



### Figure 4 – Bending Radius



**Figure 5 – Reel Dimensions**



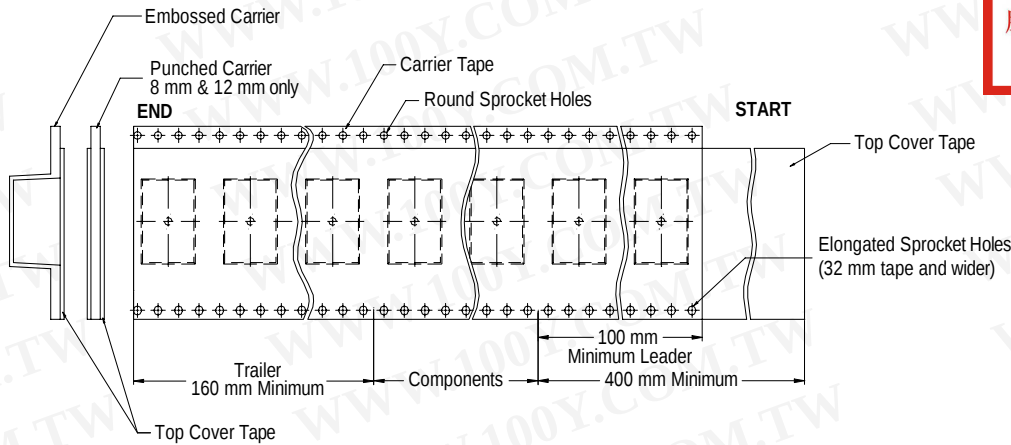
Note: Drive spokes optional; if used, dimensions B and D shall apply.

**Table 5 – Reel Dimensions**

Metric will govern

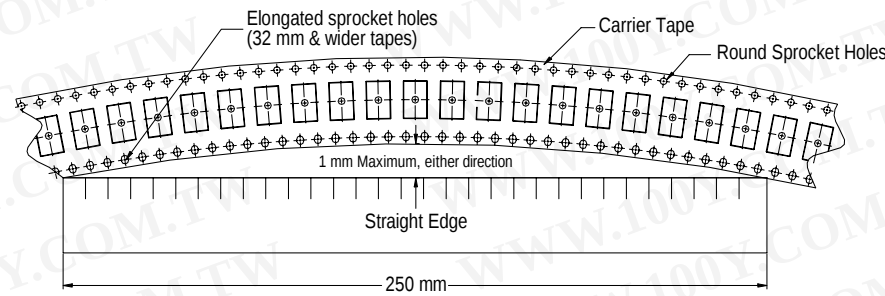
| Constant Dimensions — Millimeters (Inches) |                              |                                       |                                        |                                                      |
|--------------------------------------------|------------------------------|---------------------------------------|----------------------------------------|------------------------------------------------------|
| Tape Size                                  | A                            | B Minimum                             | C                                      | D Minimum                                            |
| 8 mm                                       | 178 ±0.20<br>(7.008 ±0.008)  | 1.5<br>(0.059)                        | 13.0 +0.5/-0.2<br>(0.521 +0.02/-0.008) | 20.2<br>(0.795)                                      |
| 12 mm                                      | or                           |                                       |                                        |                                                      |
| 16 mm                                      | 330 ±0.20<br>(13.000 ±0.008) |                                       |                                        |                                                      |
| Variable Dimensions — Millimeters (Inches) |                              |                                       |                                        |                                                      |
| Tape Size                                  | N Minimum                    | W <sub>1</sub>                        | W <sub>2</sub> Maximum                 | W <sub>3</sub>                                       |
| 8 mm                                       | 50<br>(1.969)                | 8.4 +1.5/-0.0<br>(0.331 +0.059/-0.0)  | 14.4<br>(0.567)                        | Shall accommodate tape width<br>without interference |
| 12 mm                                      |                              | 12.4 +2.0/-0.0<br>(0.488 +0.078/-0.0) | 18.4<br>(0.724)                        |                                                      |
| 16 mm                                      |                              | 16.4 +2.0/-0.0<br>(0.646 +0.078/-0.0) | 22.4<br>(0.882)                        |                                                      |

**Figure 6 – Tape Leader & Trailer Dimensions**



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**Figure 7 – Maximum Camber**



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## Other KEMET Resources

| Tools                          |                                                                             |
|--------------------------------|-----------------------------------------------------------------------------|
| Resource                       | Location                                                                    |
| Configure A Part: CapEdge      | <a href="http://capacitoredge.kemet.com">http://capacitoredge.kemet.com</a> |
| SPICE & FIT Software           | <a href="http://www.kemet.com/spice">http://www.kemet.com/spice</a>         |
| Search Our FAQs: KnowledgeEdge | <a href="http://www.kemet.com/keask">http://www.kemet.com/keask</a>         |
| Electrolytic LifeCalculator    | <a href="http://www.kemet.com:8080/elc">http://www.kemet.com:8080/elc</a>   |

| Product Information                                  |                                                                                           |
|------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Resource                                             | Location                                                                                  |
| Products                                             | <a href="http://www.kemet.com/products">http://www.kemet.com/products</a>                 |
| Technical Resources (Including Soldering Techniques) | <a href="http://www.kemet.com/technicalpapers">http://www.kemet.com/technicalpapers</a>   |
| RoHS Statement                                       | <a href="http://www.kemet.com/rohs">http://www.kemet.com/rohs</a>                         |
| Quality Documents                                    | <a href="http://www.kemet.com/qualitydocuments">http://www.kemet.com/qualitydocuments</a> |

| Product Request         |                                                                       |
|-------------------------|-----------------------------------------------------------------------|
| Resource                | Location                                                              |
| Sample Request          | <a href="http://www.kemet.com/sample">http://www.kemet.com/sample</a> |
| Engineering Kit Request | <a href="http://www.kemet.com/kits">http://www.kemet.com/kits</a>     |

| Contact            |                                                                                     |
|--------------------|-------------------------------------------------------------------------------------|
| Resource           | Location                                                                            |
| Website            | <a href="http://www.kemet.com">www.kemet.com</a>                                    |
| Contact Us         | <a href="http://www.kemet.com/contact">http://www.kemet.com/contact</a>             |
| Investor Relations | <a href="http://www.kemet.com/ir">http://www.kemet.com/ir</a>                       |
| Call Us            | 1-877-MyKEMET                                                                       |
| Twitter            | <a href="http://twitter.com/kemetcapacitors">http://twitter.com/kemetcapacitors</a> |

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