



# THE DATASHEET OF T491B476K010AT

## Overview

The KEMET T491, 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 T491 is classified as moisture sensitivity level (MSL) 1 under J STD 020, with unlimited floor life

time at  $\leq 30^{\circ}\text{C}/85\% \text{ RH}$ . The T491 standard terminations are available in 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. Standard packaging of these devices is Tape & Reel in accordance with EIA 481. This system provides perfect compatibility with all tape-fed placement units.

## Benefits

- Meets or exceeds EIA Standard 535BAAC
- Tape & Reel standard packaging per EIA 481
- Symmetrical, compliant terminations
- Optional gold-plated terminations
- Laser-marked case
- 100% surge current test on C, D, E, U, V, and X sizes
- Halogen free epoxy
- Capacitance 0.1 – 1,000  $\mu\text{F}$
- Tolerance  $\pm 10\%$ ,  $\pm 20\%$
- Voltage 2.5 – 50 VDC
- Extended range values
- Low profile case sizes
- RoHS compliant and lead-free terminations
- Operating temperature range of  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$



## Applications

Typical applications include decoupling and filtering in many 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, Gold-plated or Non-magnetic 100% Sn solder.

- Halogen-free
- Epoxy compliant with UL94 V-0
- Molded Epoxy complies for outgassing testing under ASTM E 595.

## K-SIM

For a detailed analysis of specific part numbers, please visit [ksim.kemet.com](http://ksim.kemet.com) to access KEMET's K-SIM software. KEMET K-SIM is designed to simulate behavior of components with respect to frequency, ambient temperature, and DC bias levels.

## Ordering Information

| T               | 491        | X                                  | 157                                                                                    | K                     | 020                                                                                                                  | A                   | T                                                                                                                                                                                      |                                    |
|-----------------|------------|------------------------------------|----------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Capacitor Class | Series     | Case Size                          | Capacitance Code (pF)                                                                  | Capacitance Tolerance | Rated Voltage (VDC)                                                                                                  | Failure Rate/Design | Termination Finish                                                                                                                                                                     | Packaging (C-Spec)                 |
| T = Tantalum    | Industrial | A, B, C, D, E, M, S, T, U, V, W, X | First two digits represent significant figures. Third digit specifies number of zeros. | K = ±10%<br>M = ±20%  | 2R5 = 2.5<br>003 = 3<br>004 = 4<br>006 = 6.3<br>010 = 10<br>016 = 16<br>020 = 20<br>025 = 25<br>035 = 35<br>050 = 50 | A =<br>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 µF at 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         | ≤ 0.01 CV (µA) at rated voltage after 5 minutes     |

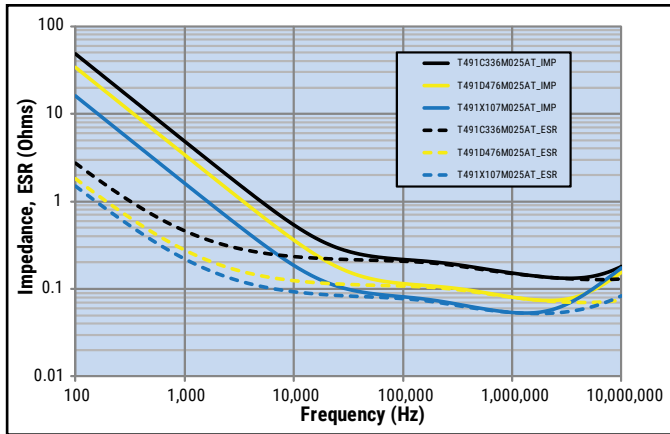
## Qualification

| Test                           | Condition                                                                                                              | Characteristics |                              |       |          |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------|-------|----------|
| Endurance                      | 85°C at rated voltage, 2,000 hours<br>125°C at 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 at 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                  | 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/<br>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        |       |          |

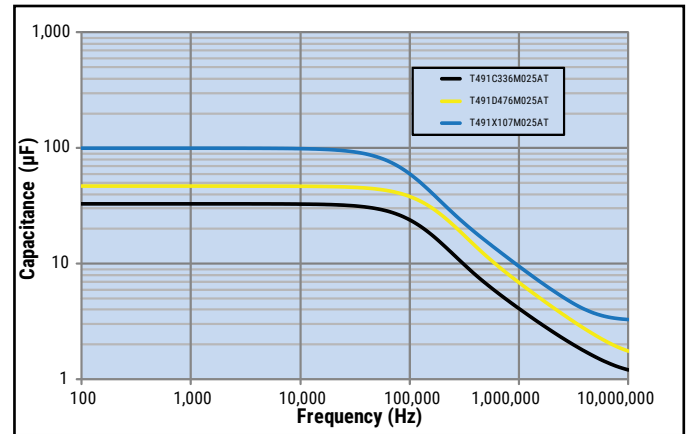
\*IL = Initial limit

## Electrical Characteristics

ESR vs. Frequency

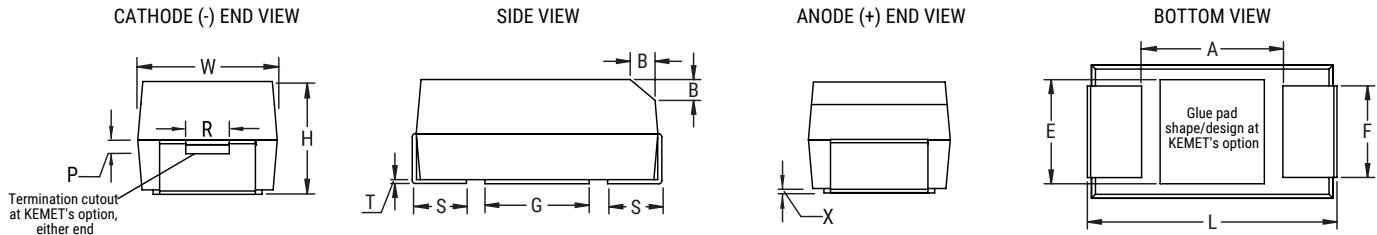


Capacitance vs. Frequency



## Dimensions – Millimeters (Inches)

Metric will govern



| Case Size |         | Component                  |                            |                            |                    |                                        |                        |                              |                |                |                 |                |                |                |
|-----------|---------|----------------------------|----------------------------|----------------------------|--------------------|----------------------------------------|------------------------|------------------------------|----------------|----------------|-----------------|----------------|----------------|----------------|
| KEMET     | EIA     | L                          | W                          | H                          | F ±0.1<br>±(0.004) | S                                      | B ±0.15<br>(Ref)±0.006 | X<br>(Ref)                   | P<br>(Ref)     | R<br>(Ref)     | T<br>(Ref)      | A<br>(Min)     | G<br>(Ref)     | E<br>(Ref)     |
| A         | 3216-18 | 3.2 ±0.2<br>(0.126 ±0.008) | 1.6 ±0.2<br>(0.063 ±0.008) | 1.6 ±0.2<br>(0.063 ±0.008) | 1.2<br>(0.047)     | 0.80(0.032)<br>+0.2(0.008)/-0.3(0.011) | 0.4<br>(0.016)         | 0.10 ±0.10<br>(0.004 ±0.004) | 0.4<br>(0.016) | 0.4<br>(0.016) | 0.13<br>(0.005) | 1.2<br>(0.047) | 1.1<br>(0.043) | 1.3<br>(0.051) |
| 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<br>(0.087)     | 0.80(0.032)<br>+0.1(0.004)/-0.3(0.011) | 0.4<br>(0.016)         | 0.10 ±0.10<br>(0.004 ±0.004) | 0.5<br>(0.020) | 1.0<br>(0.039) | 0.13<br>(0.005) | 1.9<br>(0.075) | 1.8<br>(0.071) | 2.2<br>(0.087) |
| C         | 6032-28 | 6.0 ±0.3<br>(0.236 ±0.012) | 3.2 ±0.3<br>(0.126 ±0.012) | 2.5 ±0.3<br>(0.098 ±0.012) | 2.2<br>(0.087)     | 1.30 (0.051)<br>±0.3 (0.011)           | 0.5<br>(0.020)         | 0.10 ±0.10<br>(0.004 ±0.004) | 0.9<br>(0.035) | 1.0<br>(0.039) | 0.13<br>(0.005) | 2.9<br>(0.114) | 2.8<br>(0.110) | 2.4<br>(0.094) |
| 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<br>(0.094)     | 1.30 (0.051)<br>±0.3 (0.011)           | 0.5<br>(0.020)         | 0.10 ±0.10<br>(0.004 ±0.004) | 0.9<br>(0.035) | 1.0<br>(0.039) | 0.13<br>(0.005) | 3.6<br>(0.142) | 3.5<br>(0.138) | 3.5<br>(0.138) |
| 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<br>(0.094)     | 1.30 (0.051)<br>±0.3 (0.011)           | 0.5<br>(0.020)         | 0.10 ±0.10<br>(0.004 ±0.004) | 1.7<br>(0.067) | 1.0<br>(0.039) | 0.13<br>(0.005) | 3.6<br>(0.142) | 3.5<br>(0.138) | 3.5<br>(0.138) |
| 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<br>(0.161)     | 1.30 (0.051)<br>±0.3 (0.011)           | 0.5<br>(0.020)         | 0.10 ±0.10<br>(0.004 ±0.004) | N/A            | N/A            | 0.13<br>(0.005) | 3.6<br>(0.142) | 3.5<br>(0.138) | 3.5<br>(0.138) |
| M         | 3528-15 | 3.5 ±0.2<br>(0.138 ±0.008) | 2.8 ±0.2<br>(0.110 ±0.008) | 1.4 ±0.1<br>(0.055 ±0.004) | 2.2<br>(.087)      | 0.8<br>(0.031)                         | N/A                    | 0.05<br>(0.002)              | N/A            | N/A            | 0.13<br>(.005)  | 1.9<br>(0.075) | 1.8<br>(.071)  | 2.2<br>(.087)  |
| S         | 3216-12 | 3.2 ±0.2<br>(0.126 ±0.008) | 1.6 ±0.2<br>(0.063 ±0.008) | 1.1 ±0.1<br>(0.043 ±0.004) | 1.2<br>(0.047)     | 0.80(0.032)<br>+0.2(0.008)/-0.3(0.011) | N/A                    | 0.05<br>(0.002)              | N/A            | N/A            | 0.13<br>(0.005) | 1.2<br>(0.047) | 1.1<br>(0.043) | 1.3<br>(0.051) |
| T         | 3528-12 | 3.5 ±0.2<br>(0.138 ±0.008) | 2.8 ±0.2<br>(0.110 ±0.008) | 1.1 ±0.1<br>(0.043 ±0.004) | 2.2<br>(0.087)     | 0.80(0.032)<br>+0.1(0.004)/-0.3(0.011) | N/A                    | 0.05<br>(0.002)              | N/A            | N/A            | 0.13<br>(0.005) | 1.9<br>(0.075) | 1.8<br>(0.071) | 2.2<br>(0.087) |
| U         | 6032-15 | 6.0 ±0.3<br>(0.236 ±0.012) | 3.2 ±0.2<br>(0.110 ±0.008) | 1.4 ±0.1<br>(0.055 ±0.004) | 2.2<br>(0.087)     | 1.30 (0.051)<br>±0.3 (0.011)           | N/A                    | 0.05<br>(0.002)              | N/A            | N/A            | 0.13<br>(0.005) | 2.9<br>(0.114) | 2.8<br>(0.110) | 2.4<br>(0.094) |
| V         | 7343-20 | 7.3 ±0.3<br>(0.287 ±0.012) | 4.3 ±0.3<br>(0.169 ±0.012) | 1.8 ±0.2<br>(0.071 ±0.008) | 2.4<br>(0.094)     | 1.30 (0.051)<br>±0.3 (0.011)           | N/A                    | 0.05<br>(0.002)              | N/A            | N/A            | 0.13<br>(0.005) | 3.6<br>(0.142) | 3.5<br>(0.138) | 3.5<br>(0.138) |
| W         | 7343-15 | 7.3 ±0.3<br>(0.287 ±0.012) | 4.3 ±0.3<br>(0.169 ±0.012) | 1.4 ±0.1<br>(0.055 ±0.004) | 2.4<br>(0.094)     | 1.30 (0.051)<br>±0.3 (0.011)           | N/A                    | 0.05<br>(0.002)              | N/A            | N/A            | 0.13<br>(0.005) | 3.6<br>(0.142) | 3.5<br>(.0138) | 3.5<br>(0.138) |

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

**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 (rms) |                        |                         | Maximum Operating Temp | MSL                     |
|---------------|-----------|-------------------------|------------------------------|--------------------------------------|---------------------------------|----------------------------------|----------------------------------------|------------------------|-------------------------|------------------------|-------------------------|
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| 2.5           | 100       | T/3528-12               | T491T107(1)2R5A(2)           | 2.5                                  | 24.0                            | 3.9                              | 134                                    | 121                    | 54                      | 125                    | 1                       |
| 2.5           | 220       | D/7343-31               | T491D227(1)2R5A(2)           | 5.5                                  | 8.0                             | 0.3                              | 707                                    | 636                    | 283                     | 125                    | 1                       |
| 3             | 33        | A/3216-18               | T491A336(1)003A(2)           | 1.0                                  | 6.0                             | 4.0                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 4             | 3.3       | A/3216-18               | T491A335(1)004A(2)           | 0.5                                  | 6.0                             | 8.0                              | 97                                     | 87                     | 39                      | 125                    | 1                       |
| 4             | 4.7       | A/3216-18               | T491A475(1)004A(2)           | 0.5                                  | 6.0                             | 8.0                              | 97                                     | 87                     | 39                      | 125                    | 1                       |
| 4             | 6.8       | A/3216-18               | T491A685(1)004A(2)           | 0.5                                  | 6.0                             | 6.0                              | 112                                    | 101                    | 45                      | 125                    | 1                       |
| 4             | 6.8       | S/3216-12               | T491S685(1)004A(2)           | 0.5                                  | 6.0                             | 15.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| 4             | 10        | B/3528-21               | T491B106(1)004A(2)           | 0.5                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 4             | 10        | A/3216-18               | T491A106(1)004A(2)           | 0.5                                  | 6.0                             | 4.5                              | 129                                    | 116                    | 52                      | 125                    | 1                       |
| 4             | 10        | S/3216-12               | T491S106(1)004A(2)           | 0.5                                  | 6.0                             | 15.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| 4             | 15        | B/3528-21               | T491B156(1)004A(2)           | 0.6                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 4             | 15        | A/3216-18               | T491A156(1)004A(2)           | 0.6                                  | 6.0                             | 4.0                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 4             | 15        | T/3528-12               | T491T156(1)004A(2)           | 0.6                                  | 6.0                             | 5.0                              | 118                                    | 106                    | 47                      | 125                    | 1                       |
| 4             | 15        | S/3216-12               | T491S156(1)004A(2)           | 0.6                                  | 10.0                            | 15.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| 4             | 22        | C/6032-28               | T491C226(1)004A(2)           | 0.9                                  | 6.0                             | 1.8                              | 247                                    | 222                    | 99                      | 125                    | 1                       |
| 4             | 22        | B/3528-21               | T491B226(1)004A(2)           | 0.9                                  | 6.0                             | 3.0                              | 168                                    | 151                    | 67                      | 125                    | 1                       |
| 4             | 22        | A/3216-18               | T491A226(1)004A(2)           | 0.9                                  | 6.0                             | 3.5                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 4             | 22        | T/3528-12               | T491T226(1)004A(2)           | 0.9                                  | 6.0                             | 5.0                              | 118                                    | 106                    | 47                      | 125                    | 1                       |
| 4             | 22        | S/3216-12               | T491S226(1)004A(2)           | 0.9                                  | 10.0                            | 10.0                             | 77                                     | 69                     | 31                      | 125                    | 1                       |
| 4             | 33        | C/6032-28               | T491C336(1)004A(2)           | 1.3                                  | 6.0                             | 1.8                              | 247                                    | 222                    | 99                      | 125                    | 1                       |
| 4             | 33        | U/6032-15               | T491U336(1)004A(2)           | 1.3                                  | 6.0                             | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 4             | 33        | B/3528-21               | T491B336(1)004A(2)           | 1.3                                  | 6.0                             | 2.5                              | 184                                    | 166                    | 74                      | 125                    | 1                       |
| 4             | 33        | A/3216-18               | T491A336(1)004A(2)           | 1.3                                  | 6.0                             | 3.0                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 4             | 33        | T/3528-12               | T491T336(1)004A(2)           | 1.3                                  | 8.0                             | 5.0                              | 118                                    | 106                    | 47                      | 125                    | 1                       |
| 4             | 47        | C/6032-28               | T491C476(1)004A(2)           | 1.9                                  | 6.0                             | 1.6                              | 262                                    | 236                    | 105                     | 125                    | 1                       |
| 4             | 47        | U/6032-15               | T491U476(1)004A(2)           | 1.9                                  | 6.0                             | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 4             | 47        | B/3528-21               | T491B476(1)004A(2)           | 1.9                                  | 6.0                             | 2.0                              | 206                                    | 185                    | 82                      | 125                    | 1                       |
| 4             | 47        | A/3216-18               | T491A476(1)004A(2)           | 1.9                                  | 10.0                            | 2.5                              | 173                                    | 156                    | 69                      | 125                    | 1                       |
| 4             | 47        | T/3528-12               | T491T476(M)004A(2)           | 1.9                                  | 12.0                            | 6.0                              | 108                                    | 97                     | 43                      | 125                    | 1                       |
| 4             | 68        | D/7343-31               | T491D686(1)004A(2)           | 2.7                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 4             | 68        | C/6032-28               | T491C686(1)004A(2)           | 2.7                                  | 6.0                             | 1.5                              | 271                                    | 244                    | 108                     | 125                    | 1                       |
| 4             | 68        | U/6032-15               | T491U686(1)004A(2)           | 2.7                                  | 6.0                             | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 4             | 68        | B/3528-21               | T491B686(1)004A(2)           | 2.7                                  | 6.0                             | 1.8                              | 217                                    | 195                    | 87                      | 125                    | 1                       |
| 4             | 68        | A/3216-18               | T491A686(1)004A(2)           | 2.7                                  | 30.0                            | 4.0                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 4             | 100       | D/7343-31               | T491D107(1)004A(2)           | 4.0                                  | 8.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 4             | 100       | C/6032-28               | T491C107(1)004A(2)           | 4.0                                  | 8.0                             | 1.2                              | 303                                    | 273                    | 121                     | 125                    | 1                       |
| 4             | 100       | U/6032-15               | T491U107(1)004A(2)           | 4.0                                  | 10.0                            | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 4             | 100       | B/3528-21               | T491B107(1)004A(2)           | 4.0                                  | 8.0                             | 0.9                              | 307                                    | 276                    | 123                     | 125                    | 1                       |
| 4             | 100       | A/3216-18               | T491A107(M)004A(2)           | 4.0                                  | 30.0                            | 4.0                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 4             | 100       | T/3528-12               | T491T107(M)004A(2)           | 4.0                                  | 30.0                            | 5.0                              | 118                                    | 106                    | 47                      | 125                    | 1                       |
| 4             | 150       | D/7343-31               | T491D157(1)004A(2)           | 6.0                                  | 8.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 4             | 150       | U/6032-15               | T491U157(1)004A(2)           | 6.0                                  | 8.0                             | 1.3                              | 263                                    | 237                    | 105                     | 125                    | 1                       |
| 4             | 150       | V/7343-20               | T491V157(1)004A(2)           | 6.0                                  | 8.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 4             | 150       | C/6032-28               | T491C157(1)004A(2)           | 6.0                                  | 8.0                             | 1.2                              | 303                                    | 273                    | 121                     | 125                    | 1                       |
| 4             | 150       | B/3528-21               | T491B157(1)004A(2)           | 6.0                                  | 12.0                            | 2.0                              | 206                                    | 185                    | 82                      | 125                    | 1                       |
| 4             | 220       | V/7343-20               | T491V227(1)004A(2)           | 8.8                                  | 8.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |

(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 details.

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.**

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |
|---------------|-----------|-------------------------|------------------------------|--------------------------------------|---------------------------------|----------------------------------|----------------------------------------|------------------------|-------------------------|------------------------|-------------------------|
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| 4             | 220       | B/3528-21               | T491B227(1)004A(2)           | 8.8                                  | 18.0                            | 0.5                              | 412                                    | 371                    | 165                     | 125                    | 1                       |
| 4             | 220       | C/6032-28               | T491C227(1)004A(2)           | 8.8                                  | 15.0                            | 1.2                              | 303                                    | 273                    | 121                     | 125                    | 1                       |
| 4             | 220       | D/7343-31               | T491D227(1)004A(2)           | 8.8                                  | 8.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 4             | 220       | W/7343-15               | T491W227(1)004AT             | 8.8                                  | 8.0                             | 0.8                              | 474                                    | 427                    | 190                     | 125                    | 1                       |
| 4             | 330       | D/7343-31               | T491D337(1)004A(2)           | 13.2                                 | 8.0                             | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 4             | 330       | V/7343-20               | T491V337(1)004A(2)           | 13.2                                 | 12.0                            | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 4             | 330       | C/6032-28               | T491C337(1)004A(2)           | 13.2                                 | 10.0                            | 0.9                              | 350                                    | 315                    | 140                     | 125                    | 1                       |
| 4             | 330       | X/7343-43               | T491X337(1)004A(2)           | 13.2                                 | 8.0                             | 0.8                              | 454                                    | 409                    | 182                     | 125                    | 1                       |
| 4             | 470       | X/7343-43               | T491X477(1)004A(2)           | 18.8                                 | 8.0                             | 0.5                              | 574                                    | 517                    | 230                     | 125                    | 1                       |
| 4             | 470       | D/7343-31               | T491D477(1)004A(2)           | 18.8                                 | 8.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 4             | 680       | X/7343-43               | T491X687(1)004A(2)           | 27.2                                 | 12.0                            | 0.5                              | 574                                    | 517                    | 230                     | 125                    | 1                       |
| 4             | 680       | D/7343-31               | T491D687(1)004A(2)           | 27.2                                 | 12.0                            | 0.5                              | 548                                    | 493                    | 219                     | 125                    | 1                       |
| 4             | 1000      | X/7343-43               | T491X108(1)004A(2)           | 40.0                                 | 12.0                            | 0.5                              | 574                                    | 517                    | 230                     | 125                    | 1                       |
| 4             | 1000      | E/7360-38               | T491E108(M)004A(2)           | 40.0                                 | 15.0                            | 0.2                              | 1000                                   | 900                    | 400                     | 125                    | 1                       |
| 6.3           | 2.2       | A/3216-18               | T491A225(1)006A(2)           | 0.5                                  | 6.0                             | 8.0                              | 97                                     | 87                     | 39                      | 125                    | 1                       |
| 6.3           | 3.3       | A/3216-18               | T491A335(1)006A(2)           | 0.5                                  | 6.0                             | 7.0                              | 97                                     | 87                     | 39                      | 125                    | 1                       |
| 6.3           | 4.7       | A/3216-18               | T491A475(1)006A(2)           | 0.5                                  | 6.0                             | 5.5                              | 112                                    | 101                    | 45                      | 125                    | 1                       |
| 6.3           | 4.7       | S/3216-12               | T491S475(1)006A(2)           | 0.5                                  | 6.0                             | 15.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| 6.3           | 6.8       | B/3528-21               | T491B685(1)006A(2)           | 0.5                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 6.3           | 6.8       | A/3216-18               | T491A685(1)006A(2)           | 0.5                                  | 6.0                             | 6.0                              | 112                                    | 101                    | 45                      | 125                    | 1                       |
| 6.3           | 6.8       | S/3216-12               | T491S685(1)006A(2)           | 0.5                                  | 6.0                             | 15.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| 6.3           | 10        | B/3528-21               | T491B106(1)006A(2)           | 0.6                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 6.3           | 10        | A/3216-18               | T491A106(1)006A(2)           | 0.6                                  | 6.0                             | 4.0                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 6.3           | 10        | T/3528-12               | T491T106(1)006A(2)           | 0.6                                  | 6.0                             | 5.0                              | 118                                    | 106                    | 47                      | 125                    | 1                       |
| 6.3           | 10        | S/3216-12               | T491S106(1)006A(2)           | 0.6                                  | 10.0                            | 15.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| 6.3           | 15        | C/6032-28               | T491C156(1)006A(2)           | 0.9                                  | 6.0                             | 1.8                              | 247                                    | 222                    | 99                      | 125                    | 1                       |
| 6.3           | 15        | B/3528-21               | T491B156(1)006A(2)           | 0.9                                  | 6.0                             | 3.0                              | 168                                    | 151                    | 67                      | 125                    | 1                       |
| 6.3           | 15        | A/3216-18               | T491A156(1)006A(2)           | 0.9                                  | 6.0                             | 3.5                              | 146                                    | 131                    | 58                      | 125                    | 1                       |
| 6.3           | 15        | T/3528-12               | T491T156(1)006A(2)           | 0.9                                  | 6.0                             | 3.5                              | 141                                    | 127                    | 56                      | 125                    | 1                       |
| 6.3           | 15        | S/3216-12               | T491S156(1)006A(2)           | 0.9                                  | 15.0                            | 10.0                             | 77                                     | 69                     | 31                      | 125                    | 1                       |
| 6.3           | 22        | C/6032-28               | T491C226(1)006A(2)           | 1.4                                  | 6.0                             | 1.8                              | 247                                    | 222                    | 99                      | 125                    | 1                       |
| 6.3           | 22        | U/6032-15               | T491U226(1)006A(2)           | 1.4                                  | 6.0                             | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 6.3           | 22        | B/3528-21               | T491B226(1)006A(2)           | 1.4                                  | 6.0                             | 2.0                              | 206                                    | 185                    | 82                      | 125                    | 1                       |
| 6.3           | 22        | A/3216-18               | T491A226(1)006A(2)           | 1.4                                  | 6.0                             | 3.0                              | 158                                    | 142                    | 63                      | 125                    | 1                       |
| 6.3           | 22        | T/3528-12               | T491T226(1)006A(2)           | 1.4                                  | 8.0                             | 5.0                              | 118                                    | 106                    | 47                      | 125                    | 1                       |
| 6.3           | 33        | C/6032-28               | T491C336(1)006A(2)           | 2.1                                  | 6.0                             | 1.6                              | 247                                    | 222                    | 99                      | 125                    | 1                       |
| 6.3           | 33        | U/6032-15               | T491U336(1)006A(2)           | 2.1                                  | 6.0                             | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 6.3           | 33        | B/3528-21               | T491B336(1)006A(2)           | 2.1                                  | 6.0                             | 2.2                              | 168                                    | 151                    | 67                      | 125                    | 1                       |
| 6.3           | 33        | A/3216-18               | T491A336(1)006A(2)           | 2.1                                  | 12.0                            | 2.5                              | 173                                    | 156                    | 69                      | 125                    | 1                       |
| 6.3           | 33        | T/3528-12               | T491T336(1)006A(2)           | 2.1                                  | 12.0                            | 6.0                              | 108                                    | 97                     | 43                      | 125                    | 1                       |
| 6.3           | 47        | D/7343-31               | T491D476(1)006A(2)           | 3.0                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 6.3           | 47        | C/6032-28               | T491C476(1)006A(2)           | 3.0                                  | 6.0                             | 1.5                              | 262                                    | 236                    | 105                     | 125                    | 1                       |
| 6.3           | 47        | U/6032-15               | T491U476(1)006A(2)           | 3.0                                  | 6.0                             | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 6.3           | 47        | V/7343-20               | T491V476(1)006A(2)           | 3.0                                  | 6.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 6.3           | 47        | B/3528-21               | T491B476(1)006A(2)           | 3.0                                  | 6.0                             | 2.0                              | 206                                    | 185                    | 82                      | 125                    | 1                       |
| 6.3           | 47        | A/3216-18               | T491A476(1)006A(2)           | 3.0                                  | 12.0                            | 3.5                              | 146                                    | 131                    | 58                      | 125                    | 1                       |
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |

(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 details.

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.**

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |
|---------------|-----------|-------------------------|------------------------------|--------------------------------------|---------------------------------|----------------------------------|----------------------------------------|------------------------|-------------------------|------------------------|-------------------------|
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| 6.3           | 47        | T/3528-12               | T491T476(1)006A(2)           | 3.0                                  | 10.0                            | 2.0                              | 187                                    | 168                    | 75                      | 125                    | 1                       |
| 6.3           | 68        | D/7343-31               | T491D686(1)006A(2)           | 4.3                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 6.3           | 68        | C/6032-28               | T491C686(1)006A(2)           | 4.3                                  | 6.0                             | 1.2                              | 303                                    | 273                    | 121                     | 125                    | 1                       |
| 6.3           | 68        | U/6032-15               | T491U686(1)006A(2)           | 4.3                                  | 10.0                            | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 6.3           | 68        | V/7343-20               | T491V686(1)006A(2)           | 4.3                                  | 6.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 6.3           | 68        | B/3528-21               | T491B686(1)006A(2)           | 4.3                                  | 8.0                             | 0.9                              | 307                                    | 276                    | 123                     | 125                    | 1                       |
| 6.3           | 68        | A/3216-18               | T491A686(1)006A(2)           | 4.3                                  | 30.0                            | 4.0                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 6.3           | 100       | D/7343-31               | T491D107(1)006A(2)           | 6.3                                  | 8.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 6.3           | 100       | V/7343-20               | T491V107(1)006A(2)           | 6.3                                  | 8.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 6.3           | 100       | C/6032-28               | T491C107(1)006A(2)           | 6.3                                  | 8.0                             | 0.9                              | 350                                    | 315                    | 140                     | 125                    | 1                       |
| 6.3           | 100       | U/6032-15               | T491U107(1)006A(2)           | 6.3                                  | 10.0                            | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 6.3           | 100       | B/3528-21               | T491B107(1)006A(2)           | 6.3                                  | 12.0                            | 2.0                              | 206                                    | 185                    | 82                      | 125                    | 1                       |
| 6.3           | 100       | M/3528-15               | T491M107(1)006A(2)           | 6.3                                  | 20.0                            | 3.0                              | 200                                    | 180                    | 80                      | 125                    | 1                       |
| 6.3           | 150       | B/3528-21               | T491B157(1)006A(2)           | 9.5                                  | 15.0                            | 3.0                              | 168                                    | 151                    | 67                      | 125                    | 1                       |
| 6.3           | 150       | D/7343-31               | T491D157(1)006A(2)           | 9.5                                  | 8.0                             | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 6.3           | 150       | C/6032-28               | T491C157(1)006A(2)           | 9.5                                  | 8.0                             | 1.2                              | 303                                    | 273                    | 121                     | 125                    | 1                       |
| 6.3           | 150       | V/7343-20               | T491V157(1)006A(2)           | 9.5                                  | 8.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 6.3           | 150       | U/6032-15               | T491U157(1)006A(2)           | 9.5                                  | 8.0                             | 0.6                              | 387                                    | 348                    | 155                     | 125                    | 1                       |
| 6.3           | 150       | W/7343-15               | T491W157(1)006AT             | 9.5                                  | 8.0                             | 0.8                              | 474                                    | 427                    | 190                     | 125                    | 1                       |
| 6.3           | 150       | X/7343-43               | T491X157(1)006A(2)           | 9.5                                  | 8.0                             | 0.7                              | 486                                    | 437                    | 194                     | 125                    | 1                       |
| 6.3           | 220       | X/7343-43               | T491X227(1)006A(2)           | 13.9                                 | 8.0                             | 0.7                              | 486                                    | 437                    | 194                     | 125                    | 1                       |
| 6.3           | 220       | D/7343-31               | T491D227(1)006A(2)           | 13.9                                 | 8.0                             | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 6.3           | 220       | C/6032-28               | T491C227(1)006A(2)           | 13.9                                 | 10.0                            | 1.0                              | 332                                    | 299                    | 133                     | 125                    | 1                       |
| 6.3           | 220       | V/7343-20               | T491V227(1)006A(2)           | 13.9                                 | 8.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 6.3           | 220       | W/7343-15               | T491W227(1)006AT             | 13.9                                 | 8.0                             | 0.8                              | 474                                    | 427                    | 190                     | 125                    | 1                       |
| 6.3           | 330       | C/6032-28               | T491C337(1)006A(2)           | 20.8                                 | 12.0                            | 1.2                              | 303                                    | 273                    | 121                     | 125                    | 1                       |
| 6.3           | 330       | V/7343-20               | T491V337(1)006A(2)           | 20.8                                 | 8.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 6.3           | 330       | X/7343-43               | T491X337(1)006A(2)           | 20.8                                 | 8.0                             | 0.4                              | 642                                    | 578                    | 257                     | 125                    | 1                       |
| 6.3           | 330       | D/7343-31               | T491D337(1)006A(2)           | 20.8                                 | 8.0                             | 0.4                              | 612                                    | 551                    | 245                     | 125                    | 1                       |
| 6.3           | 330       | E/7360-38               | T491E337(1)006A(2)           | 20.8                                 | 8.0                             | 0.5                              | 632                                    | 569                    | 253                     | 125                    | 1                       |
| 6.3           | 470       | X/7343-43               | T491X477(1)006A(2)           | 29.6                                 | 8.0                             | 0.4                              | 642                                    | 578                    | 257                     | 125                    | 1                       |
| 6.3           | 470       | D/7343-31               | T491D477(1)006A(2)           | 29.6                                 | 12.0                            | 0.4                              | 612                                    | 551                    | 245                     | 125                    | 1                       |
| 6.3           | 470       | V/7343-20               | T491V477(1)006A(2)           | 29.6                                 | 15.0                            | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 6.3           | 470       | E/7360-38               | T491E477(1)006A(2)           | 29.6                                 | 10.0                            | 0.4                              | 707                                    | 636                    | 283                     | 125                    | 1                       |
| 6.3           | 680       | X/7343-43               | T491X687(1)006A(2)           | 42.8                                 | 15.0                            | 0.6                              | 524                                    | 472                    | 210                     | 125                    | 1                       |
| 6.3           | 680       | E/7360-38               | T491E687(M)006A(2)           | 42.8                                 | 12.0                            | 0.5                              | 632                                    | 569                    | 253                     | 125                    | 1                       |
| 6.3           | 1000      | X/7343-43               | T491X108(1)006A(2)           | 63.0                                 | 15.0                            | 0.6                              | 524                                    | 472                    | 210                     | 125                    | 1                       |
| 10            | 1         | A/3216-18               | T491A105(1)010A(2)           | 0.5                                  | 4.0                             | 10.0                             | 87                                     | 78                     | 35                      | 125                    | 1                       |
| 10            | 1.5       | A/3216-18               | T491A155(1)010A(2)           | 0.5                                  | 6.0                             | 8.0                              | 97                                     | 87                     | 39                      | 125                    | 1                       |
| 10            | 2.2       | B/3528-21               | T491B225(1)010A(2)           | 0.5                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 10            | 2.2       | A/3216-18               | T491A225(1)010A(2)           | 0.5                                  | 6.0                             | 7.0                              | 97                                     | 87                     | 39                      | 125                    | 1                       |
| 10            | 3.3       | A/3216-18               | T491A335(1)010A(2)           | 0.5                                  | 6.0                             | 5.5                              | 117                                    | 105                    | 47                      | 125                    | 1                       |
| 10            | 3.3       | S/3216-12               | T491S335(1)010A(2)           | 0.5                                  | 6.0                             | 15.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| 10            | 4.7       | B/3528-21               | T491B475(1)010A(2)           | 0.5                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 10            | 4.7       | A/3216-18               | T491A475(1)010A(2)           | 0.5                                  | 6.0                             | 4.0                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 10            | 4.7       | S/3216-12               | T491S475(1)010A(2)           | 0.5                                  | 6.0                             | 15.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |

(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 details.

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.**

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |
|---------------|-----------|-------------------------|------------------------------|--------------------------------------|---------------------------------|----------------------------------|----------------------------------------|------------------------|-------------------------|------------------------|-------------------------|
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| 10            | 6.8       | B/3528-21               | T491B685(1)010A(2)           | 0.7                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 10            | 6.8       | A/3216-18               | T491A685(1)010A(2)           | 0.7                                  | 6.0                             | 4.0                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 10            | 6.8       | T/3528-12               | T491T685(1)010A(2)           | 0.7                                  | 6.0                             | 5.0                              | 118                                    | 106                    | 47                      | 125                    | 1                       |
| 10            | 6.8       | S/3216-12               | T491S685(1)010A(2)           | 0.7                                  | 10.0                            | 15.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| 10            | 10        | C/6032-28               | T491C106(1)010A(2)           | 1.0                                  | 6.0                             | 1.8                              | 247                                    | 222                    | 99                      | 125                    | 1                       |
| 10            | 10        | B/3528-21               | T491B106(1)010A(2)           | 1.0                                  | 6.0                             | 3.0                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 10            | 10        | A/3216-18               | T491A106(1)010A(2)           | 1.0                                  | 6.0                             | 3.8                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 10            | 10        | T/3528-12               | T491T106(1)010A(2)           | 1.0                                  | 6.0                             | 3.0                              | 153                                    | 138                    | 61                      | 125                    | 1                       |
| 10            | 10        | S/3216-12               | T491S106(1)010A(2)           | 1.0                                  | 10.0                            | 15.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| 10            | 15        | C/6032-28               | T491C156(1)010A(2)           | 1.5                                  | 6.0                             | 1.8                              | 247                                    | 222                    | 99                      | 125                    | 1                       |
| 10            | 15        | U/6032-15               | T491U156(1)010A(2)           | 1.5                                  | 6.0                             | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 10            | 15        | B/3528-21               | T491B156(1)010A(2)           | 1.5                                  | 6.0                             | 2.0                              | 206                                    | 185                    | 82                      | 125                    | 1                       |
| 10            | 15        | A/3216-18               | T491A156(1)010A(2)           | 1.5                                  | 8.0                             | 6.0                              | 112                                    | 101                    | 45                      | 125                    | 1                       |
| 10            | 15        | T/3528-12               | T491T156(1)010A(2)           | 1.5                                  | 6.0                             | 2.8                              | 158                                    | 142                    | 63                      | 125                    | 1                       |
| 10            | 22        | D/7343-31               | T491D226(1)010A(2)           | 2.2                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 10            | 22        | C/6032-28               | T491C226(1)010A(2)           | 2.2                                  | 6.0                             | 1.6                              | 247                                    | 222                    | 99                      | 125                    | 1                       |
| 10            | 22        | U/6032-15               | T491U226(1)010A(2)           | 2.2                                  | 6.0                             | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 10            | 22        | B/3528-21               | T491B226(1)010A(2)           | 2.2                                  | 6.0                             | 2.0                              | 206                                    | 185                    | 82                      | 125                    | 1                       |
| 10            | 22        | A/3216-18               | T491A226(1)010A(2)           | 2.2                                  | 8.0                             | 3.2                              | 112                                    | 101                    | 45                      | 125                    | 1                       |
| 10            | 22        | T/3528-12               | T491T226(1)010A(2)           | 2.2                                  | 12.0                            | 8.0                              | 94                                     | 85                     | 38                      | 125                    | 1                       |
| 10            | 33        | D/7343-31               | T491D336(1)010A(2)           | 3.3                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 10            | 33        | V/7343-20               | T491V336(1)010A(2)           | 3.3                                  | 6.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 10            | 33        | C/6032-28               | T491C336(1)010A(2)           | 3.3                                  | 6.0                             | 1.5                              | 271                                    | 244                    | 108                     | 125                    | 1                       |
| 10            | 33        | U/6032-15               | T491U336(1)010A(2)           | 3.3                                  | 6.0                             | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 10            | 33        | B/3528-21               | T491B336(1)010A(2)           | 3.3                                  | 6.0                             | 1.8                              | 217                                    | 195                    | 87                      | 125                    | 1                       |
| 10            | 33        | T/3528-12               | T491T336(1)010A(2)           | 3.3                                  | 24.0                            | 5.0                              | 118                                    | 106                    | 47                      | 125                    | 1                       |
| 10            | 33        | A/3216-18               | T491A336(1)010A(2)           | 3.3                                  | 15.0                            | 6.0                              | 112                                    | 101                    | 45                      | 125                    | 1                       |
| 10            | 47        | D/7343-31               | T491D476(1)010A(2)           | 4.7                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 10            | 47        | V/7343-20               | T491V476(1)010A(2)           | 4.7                                  | 6.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 10            | 47        | C/6032-28               | T491C476(1)010A(2)           | 4.7                                  | 6.0                             | 1.2                              | 303                                    | 273                    | 121                     | 125                    | 1                       |
| 10            | 47        | U/6032-15               | T491U476(1)010A(2)           | 4.7                                  | 6.0                             | 1.4                              | 254                                    | 229                    | 102                     | 125                    | 1                       |
| 10            | 47        | B/3528-21               | T491B476(1)010A(2)           | 4.7                                  | 8.0                             | 1.0                              | 292                                    | 263                    | 117                     | 125                    | 1                       |
| 10            | 68        | D/7343-31               | T491D686(1)010A(2)           | 6.8                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 10            | 68        | V/7343-20               | T491V686(1)010A(2)           | 6.8                                  | 6.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 10            | 68        | C/6032-28               | T491C686(1)010A(2)           | 6.8                                  | 6.0                             | 1.0                              | 332                                    | 299                    | 133                     | 125                    | 1                       |
| 10            | 68        | W/7343-15               | T491W686(1)010AT             | 6.8                                  | 6.0                             | 1.2                              | 387                                    | 348                    | 155                     | 125                    | 1                       |
| 10            | 68        | U/6032-15               | T491U686(1)010A(2)           | 6.8                                  | 10.0                            | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 10            | 68        | B/3528-21               | T491B686(1)010A(2)           | 6.8                                  | 8.0                             | 1.0                              | 292                                    | 263                    | 117                     | 125                    | 1                       |
| 10            | 100       | B/3528-21               | T491B107(1)010A(2)           | 10.0                                 | 15.0                            | 1.2                              | 266                                    | 239                    | 106                     | 125                    | 1                       |
| 10            | 100       | D/7343-31               | T491D107(1)010A(2)           | 10.0                                 | 8.0                             | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 10            | 100       | U/6032-15               | T491U107(1)010A(2)           | 10.0                                 | 8.0                             | 0.7                              | 359                                    | 323                    | 144                     | 125                    | 1                       |
| 10            | 100       | W/7343-15               | T491W107(1)010AT             | 10.0                                 | 8.0                             | 0.8                              | 474                                    | 427                    | 190                     | 125                    | 1                       |
| 10            | 100       | C/6032-28               | T491C107(1)010A(2)           | 10.0                                 | 8.0                             | 1.0                              | 332                                    | 299                    | 133                     | 125                    | 1                       |
| 10            | 100       | V/7343-20               | T491V107(1)010A(2)           | 10.0                                 | 8.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 10            | 150       | X/7343-43               | T491X157(1)010A(2)           | 15.0                                 | 8.0                             | 0.7                              | 486                                    | 437                    | 194                     | 125                    | 1                       |
| 10            | 150       | D/7343-31               | T491D157(1)010A(2)           | 15.0                                 | 8.0                             | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |

(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 details.

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.**

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |
|---------------|-----------|-------------------------|------------------------------|--------------------------------------|---------------------------------|----------------------------------|----------------------------------------|------------------------|-------------------------|------------------------|-------------------------|
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| 10            | 150       | C/6032-28               | T491C157(1)010A(2)           | 15.0                                 | 10.0                            | 0.9                              | 350                                    | 315                    | 140                     | 125                    | 1                       |
| 10            | 150       | V/7343-20               | T491V157(1)010A(2)           | 15.0                                 | 8.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 10            | 220       | C/6032-28               | T491C227(1)010A(2)           | 22.0                                 | 10.0                            | 0.9                              | 350                                    | 315                    | 140                     | 125                    | 1                       |
| 10            | 220       | X/7343-43               | T491X227(1)010A(2)           | 22.0                                 | 8.0                             | 0.5                              | 574                                    | 517                    | 230                     | 125                    | 1                       |
| 10            | 220       | D/7343-31               | T491D227(1)010A(2)           | 22.0                                 | 8.0                             | 0.5                              | 548                                    | 493                    | 219                     | 125                    | 1                       |
| 10            | 220       | V/7343-20               | T491V227(1)010A(2)           | 22.0                                 | 8.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 10            | 330       | D/7343-31               | T491D337(1)010A(2)           | 33.0                                 | 10.0                            | 0.5                              | 548                                    | 493                    | 219                     | 125                    | 1                       |
| 10            | 330       | V/7343-20               | T491V337(1)010A(2)           | 33.0                                 | 12.0                            | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 10            | 330       | X/7343-43               | T491X337(1)010A(2)           | 33.0                                 | 10.0                            | 0.5                              | 574                                    | 517                    | 230                     | 125                    | 1                       |
| 10            | 330       | E/7360-38               | T491E337(1)010A(2)           | 33.0                                 | 10.0                            | 0.5                              | 632                                    | 569                    | 253                     | 125                    | 1                       |
| 10            | 470       | X/7343-43               | T491X477(1)010A(2)           | 47                                   | 10                              | 0.2                              | 908                                    | 817.2                  | 363.2                   | 125                    | 1                       |
| 10            | 470       | E/7360-38               | T491E477(1)010A(2)           | 47.0                                 | 12.0                            | 0.5                              | 632                                    | 569                    | 253                     | 125                    | 1                       |
| 16            | 1         | A/3216-18               | T491A105(1)016A(2)           | 0.5                                  | 4.0                             | 10.0                             | 87                                     | 78                     | 35                      | 125                    | 1                       |
| 16            | 1.5       | A/3216-18               | T491A155(1)016A(2)           | 0.5                                  | 6.0                             | 8.0                              | 97                                     | 87                     | 39                      | 125                    | 1                       |
| 16            | 2.2       | A/3216-18               | T491A225(1)016A(2)           | 0.5                                  | 6.0                             | 6.0                              | 112                                    | 101                    | 45                      | 125                    | 1                       |
| 16            | 2.2       | S/3216-12               | T491S225(1)016A(2)           | 0.5                                  | 6.0                             | 15.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| 16            | 2.2       | B/3528-21               | T491B225(1)016A(2)           | 0.5                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 16            | 3.3       | B/3528-21               | T491B335(1)016A(2)           | 0.5                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 16            | 3.3       | A/3216-18               | T491A335(1)016A(2)           | 0.5                                  | 6.0                             | 5.0                              | 122                                    | 110                    | 49                      | 125                    | 1                       |
| 16            | 4.7       | C/6032-28               | T491C475(1)016A(2)           | 0.8                                  | 6.0                             | 2.4                              | 214                                    | 193                    | 86                      | 125                    | 1                       |
| 16            | 4.7       | B/3528-21               | T491B475(1)016A(2)           | 0.8                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 16            | 4.7       | A/3216-18               | T491A475(1)016A(2)           | 0.8                                  | 6.0                             | 4.0                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 16            | 4.7       | T/3528-12               | T491T475(1)016A(2)           | 0.8                                  | 6.0                             | 5.0                              | 118                                    | 106                    | 47                      | 125                    | 1                       |
| 16            | 6.8       | C/6032-28               | T491C685(1)016A(2)           | 1.1                                  | 6.0                             | 1.9                              | 241                                    | 217                    | 96                      | 125                    | 1                       |
| 16            | 6.8       | B/3528-21               | T491B685(1)016A(2)           | 1.1                                  | 6.0                             | 2.5                              | 184                                    | 166                    | 74                      | 125                    | 1                       |
| 16            | 6.8       | A/3216-18               | T491A685(1)016A(2)           | 1.1                                  | 6.0                             | 3.5                              | 146                                    | 131                    | 58                      | 125                    | 1                       |
| 16            | 10        | C/6032-28               | T491C106(1)016A(2)           | 1.6                                  | 6.0                             | 1.8                              | 247                                    | 222                    | 99                      | 125                    | 1                       |
| 16            | 10        | U/6032-15               | T491U106(1)016A(2)           | 1.6                                  | 6.0                             | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 16            | 10        | B/3528-21               | T491B106(1)016A(2)           | 1.6                                  | 6.0                             | 2.0                              | 206                                    | 185                    | 82                      | 125                    | 1                       |
| 16            | 10        | A/3216-18               | T491A106(1)016A(2)           | 1.6                                  | 6.0                             | 3.0                              | 158                                    | 142                    | 63                      | 125                    | 1                       |
| 16            | 10        | T/3528-12               | T491T106(1)016A(2)           | 1.6                                  | 8.0                             | 8.0                              | 94                                     | 85                     | 38                      | 125                    | 1                       |
| 16            | 15        | D/7343-31               | T491D156(1)016A(2)           | 2.4                                  | 6.0                             | 1.0                              | 387                                    | 348                    | 155                     | 125                    | 1                       |
| 16            | 15        | C/6032-28               | T491C156(1)016A(2)           | 2.4                                  | 6.0                             | 1.6                              | 247                                    | 222                    | 99                      | 125                    | 1                       |
| 16            | 15        | U/6032-15               | T491U156(1)016A(2)           | 2.4                                  | 6.0                             | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 16            | 15        | B/3528-21               | T491B156(1)016A(2)           | 2.4                                  | 6.0                             | 2.0                              | 192                                    | 173                    | 77                      | 125                    | 1                       |
| 16            | 15        | A/3216-18               | T491A156(1)016A(2)           | 2.4                                  | 8.0                             | 3.5                              | 146                                    | 131                    | 58                      | 125                    | 1                       |
| 16            | 22        | D/7343-31               | T491D226(1)016A(2)           | 3.5                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 16            | 22        | C/6032-28               | T491C226(1)016A(2)           | 3.5                                  | 6.0                             | 1.5                              | 262                                    | 236                    | 105                     | 125                    | 1                       |
| 16            | 22        | U/6032-15               | T491U226(1)016A(2)           | 3.5                                  | 10.0                            | 3.0                              | 173                                    | 156                    | 69                      | 125                    | 1                       |
| 16            | 22        | B/3528-21               | T491B226(1)016A(2)           | 3.5                                  | 6.0                             | 2.2                              | 197                                    | 177                    | 79                      | 125                    | 1                       |
| 16            | 33        | D/7343-31               | T491D336(1)016A(2)           | 5.3                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 16            | 33        | C/6032-28               | T491C336(1)016A(2)           | 5.3                                  | 6.0                             | 1.2                              | 303                                    | 273                    | 121                     | 125                    | 1                       |
| 16            | 33        | U/6032-15               | T491U336(1)016A(2)           | 5.3                                  | 6.0                             | 1.0                              | 300                                    | 270                    | 120                     | 125                    | 1                       |
| 16            | 33        | B/3528-21               | T491B336(1)016A(2)           | 5.3                                  | 8.0                             | 2.0                              | 206                                    | 185                    | 82                      | 125                    | 1                       |
| 16            | 47        | D/7343-31               | T491D476(1)016A(2)           | 7.5                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 16            | 47        | V/7343-20               | T491V476(1)016A(2)           | 7.5                                  | 6.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |

(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 details.

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.**

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |
|---------------|-----------|-------------------------|------------------------------|--------------------------------------|---------------------------------|----------------------------------|----------------------------------------|------------------------|-------------------------|------------------------|-------------------------|
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| 16            | 47        | C/6032-28               | T491C476(1)016A(2)           | 7.5                                  | 6.0                             | 1.0                              | 332                                    | 299                    | 133                     | 125                    | 1                       |
| 16            | 68        | V/7343-20               | T491V686(1)016A(2)           | 10.9                                 | 6.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 16            | 68        | C/6032-28               | T491C686(1)016A(2)           | 10.9                                 | 6.0                             | 1.0                              | 303                                    | 273                    | 121                     | 125                    | 1                       |
| 16            | 68        | W/7343-15               | T491W686(1)016AT             | 10.9                                 | 6.0                             | 0.8                              | 474                                    | 427                    | 190                     | 125                    | 1                       |
| 16            | 68        | D/7343-31               | T491D686(1)016A(2)           | 10.9                                 | 6.0                             | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 16            | 100       | X/7343-43               | T491X107(1)016A(2)           | 16.0                                 | 8.0                             | 0.7                              | 486                                    | 437                    | 194                     | 125                    | 1                       |
| 16            | 100       | C/6032-28               | T491C107(1)016A(2)           | 16.0                                 | 10.0                            | 1.0                              | 332                                    | 299                    | 133                     | 125                    | 1                       |
| 16            | 100       | V/7343-20               | T491V107(1)016A(2)           | 16.0                                 | 8.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 16            | 100       | D/7343-31               | T491D107(1)016A(2)           | 16.0                                 | 8.0                             | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 16            | 150       | X/7343-43               | T491X157(1)016A(2)           | 24.0                                 | 8.0                             | 0.5                              | 574                                    | 517                    | 230                     | 125                    | 1                       |
| 16            | 150       | D/7343-31               | T491D157(1)016A(2)           | 24.0                                 | 10.0                            | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 16            | 220       | D/7343-31               | T491D227(1)016A(2)           | 35.2                                 | 15.0                            | 0.9                              | 408                                    | 367                    | 163                     | 125                    | 1                       |
| 16            | 220       | X/7343-43               | T491X227(1)016A(2)           | 35.2                                 | 10.0                            | 0.5                              | 574                                    | 517                    | 230                     | 125                    | 1                       |
| 16            | 220       | E/7360-38               | T491E227(1)016A(2)           | 35.2                                 | 7.2                             | 0.9                              | 471                                    | 424                    | 188                     | 125                    | 1                       |
| 20            | 0.68      | A/3216-18               | T491A684(1)020A(2)           | 0.5                                  | 4.0                             | 12.0                             | 79                                     | 71                     | 32                      | 125                    | 1                       |
| 20            | 0.47      | A/3216-18               | T491A474(1)020A(2)           | 0.5                                  | 4.0                             | 14.0                             | 73                                     | 66                     | 29                      | 125                    | 1                       |
| 20            | 1         | A/3216-18               | T491A105(1)020A(2)           | 0.5                                  | 4.0                             | 9.0                              | 91                                     | 82                     | 36                      | 125                    | 1                       |
| 20            | 1         | S/3216-12               | T491S105(1)020A(2)           | 0.5                                  | 6.0                             | 18.0                             | 58                                     | 52                     | 23                      | 125                    | 1                       |
| 20            | 1.5       | A/3216-18               | T491A155(1)020A(2)           | 0.5                                  | 6.0                             | 6.5                              | 107                                    | 96                     | 43                      | 125                    | 1                       |
| 20            | 1.5       | S/3216-12               | T491S155(1)020A(2)           | 0.5                                  | 6.0                             | 15.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| 20            | 2.2       | B/3528-21               | T491B225(1)020A(2)           | 0.5                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 20            | 2.2       | A/3216-18               | T491A225(1)020A(2)           | 0.5                                  | 6.0                             | 6.0                              | 104                                    | 94                     | 42                      | 125                    | 1                       |
| 20            | 3.3       | B/3528-21               | T491B335(1)020A(2)           | 0.7                                  | 6.0                             | 3.0                              | 168                                    | 151                    | 67                      | 125                    | 1                       |
| 20            | 3.3       | A/3216-18               | T491A335(1)020A(2)           | 0.7                                  | 6.0                             | 4.0                              | 129                                    | 116                    | 52                      | 125                    | 1                       |
| 20            | 3.3       | T/3528-12               | T491T335(1)020A(2)           | 0.7                                  | 6.0                             | 5.0                              | 118                                    | 106                    | 47                      | 125                    | 1                       |
| 20            | 4.7       | C/6032-28               | T491C475(1)020A(2)           | 0.9                                  | 6.0                             | 2.4                              | 214                                    | 193                    | 86                      | 125                    | 1                       |
| 20            | 4.7       | B/3528-21               | T491B475(1)020A(2)           | 0.9                                  | 6.0                             | 3.0                              | 168                                    | 151                    | 67                      | 125                    | 1                       |
| 20            | 4.7       | A/3216-18               | T491A475(1)020A(2)           | 0.9                                  | 6.0                             | 4.0                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 20            | 6.8       | C/6032-28               | T491C685(1)020A(2)           | 1.4                                  | 6.0                             | 1.9                              | 241                                    | 217                    | 96                      | 125                    | 1                       |
| 20            | 6.8       | U/6032-15               | T491U685(1)020A(2)           | 1.4                                  | 6.0                             | 1.9                              | 218                                    | 196                    | 87                      | 125                    | 1                       |
| 20            | 6.8       | B/3528-21               | T491B685(1)020A(2)           | 1.4                                  | 6.0                             | 2.0                              | 206                                    | 185                    | 82                      | 125                    | 1                       |
| 20            | 6.8       | A/3216-18               | T491A685(1)020A(2)           | 1.4                                  | 8.0                             | 6.0                              | 112                                    | 101                    | 45                      | 125                    | 1                       |
| 20            | 10        | D/7343-31               | T491D106(1)020A(2)           | 2.0                                  | 6.0                             | 1.0                              | 387                                    | 349                    | 155                     | 125                    | 1                       |
| 20            | 10        | C/6032-28               | T491C106(1)020A(2)           | 2.0                                  | 6.0                             | 1.6                              | 247                                    | 222                    | 99                      | 125                    | 1                       |
| 20            | 10        | U/6032-15               | T491U106(1)020A(2)           | 2.0                                  | 6.0                             | 1.8                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 20            | 10        | B/3528-21               | T491B106(1)020A(2)           | 2.0                                  | 6.0                             | 2.0                              | 201                                    | 181                    | 80                      | 125                    | 1                       |
| 20            | 10        | A/3216-18               | T491A106(1)020A(2)           | 2.0                                  | 10.0                            | 5.0                              | 122                                    | 110                    | 49                      | 125                    | 1                       |
| 20            | 15        | D/7343-31               | T491D156(1)020A(2)           | 3.0                                  | 6.0                             | 1.0                              | 387                                    | 348                    | 155                     | 125                    | 1                       |
| 20            | 15        | B/3528-21               | T491B156(1)020A(2)           | 3.0                                  | 6.0                             | 2.0                              | 206                                    | 185                    | 82                      | 125                    | 1                       |
| 20            | 15        | C/6032-28               | T491C156(1)020A(2)           | 3.0                                  | 6.0                             | 1.7                              | 254                                    | 229                    | 102                     | 125                    | 1                       |
| 20            | 22        | D/7343-31               | T491D226(1)020A(2)           | 4.4                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 20            | 22        | V/7343-20               | T491V226(1)020A(2)           | 4.4                                  | 6.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 20            | 22        | C/6032-28               | T491C226(1)020A(2)           | 4.4                                  | 6.0                             | 1.2                              | 303                                    | 273                    | 121                     | 125                    | 1                       |
| 20            | 22        | B/3528-21               | T491B226(1)020A(2)           | 4.4                                  | 8.0                             | 4.0                              | 146                                    | 131                    | 58                      | 125                    | 1                       |
| 20            | 33        | D/7343-31               | T491D336(1)020A(2)           | 6.6                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 20            | 33        | C/6032-28               | T491C336(1)020A(2)           | 6.6                                  | 6.0                             | 1.2                              | 303                                    | 273                    | 121                     | 125                    | 1                       |
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |

(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 details.

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.**

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |
|---------------|-----------|-------------------------|------------------------------|--------------------------------------|---------------------------------|----------------------------------|----------------------------------------|------------------------|-------------------------|------------------------|-------------------------|
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| 20            | 33        | V/7343-20               | T491V336(1)020A(2)           | 6.6                                  | 8.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 20            | 33        | B/3528-21               | T491B336(M)020A(2)           | 6.6                                  | 10.0                            | 4.0                              | 146                                    | 131                    | 58                      | 125                    | 1                       |
| 20            | 47        | C/6032-28               | T491C476(1)020A(2)           | 9.4                                  | 6.0                             | 0.9                              | 350                                    | 315                    | 140                     | 125                    | 1                       |
| 20            | 47        | X/7343-43               | T491X476(1)020A(2)           | 9.4                                  | 6.0                             | 0.8                              | 454                                    | 409                    | 182                     | 125                    | 1                       |
| 20            | 47        | D/7343-31               | T491D476(1)020A(2)           | 9.4                                  | 6.0                             | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 20            | 68        | X/7343-43               | T491X686(1)020A(2)           | 13.6                                 | 6.0                             | 0.7                              | 486                                    | 437                    | 194                     | 125                    | 1                       |
| 20            | 68        | D/7343-31               | T491D686(1)020A(2)           | 13.6                                 | 6.0                             | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 20            | 68        | C/6032-28               | T491C686(1)020A(2)           | 13.6                                 | 8.0                             | 0.5                              | 469                                    | 422                    | 188                     | 125                    | 1                       |
| 20            | 100       | X/7343-43               | T491X107(1)020A(2)           | 20.0                                 | 8.0                             | 0.5                              | 574                                    | 517                    | 230                     | 125                    | 1                       |
| 20            | 100       | D/7343-31               | T491D107(1)020A(2)           | 20.0                                 | 8.0                             | 0.9                              | 408                                    | 367                    | 163                     | 125                    | 1                       |
| 20            | 100       | E/7360-38               | T491E107(1)020A(2)           | 20.0                                 | 8.0                             | 0.5                              | 632                                    | 569                    | 253                     | 125                    | 1                       |
| 20            | 150       | X/7343-43               | T491X157(1)020A(2)           | 30.0                                 | 10.0                            | 0.4                              | 642                                    | 578                    | 257                     | 125                    | 1                       |
| 25            | 0.33      | A/3216-18               | T491A334(1)025A(2)           | 0.5                                  | 4.0                             | 15.0                             | 71                                     | 64                     | 28                      | 125                    | 1                       |
| 25            | 0.47      | A/3216-18               | T491A474(1)025A(2)           | 0.5                                  | 4.0                             | 13.0                             | 76                                     | 68                     | 30                      | 125                    | 1                       |
| 25            | 0.68      | A/3216-18               | T491A684(1)025A(2)           | 0.5                                  | 4.0                             | 10.0                             | 87                                     | 78                     | 35                      | 125                    | 1                       |
| 25            | 1         | B/3528-21               | T491B105(1)025A(2)           | 0.5                                  | 4.0                             | 5.0                              | 130                                    | 117                    | 52                      | 125                    | 1                       |
| 25            | 1         | A/3216-18               | T491A105(1)025A(2)           | 0.5                                  | 4.0                             | 8.0                              | 97                                     | 87                     | 39                      | 125                    | 1                       |
| 25            | 1         | S/3216-12               | T491S105(1)025A(2)           | 0.5                                  | 6.0                             | 18.0                             | 58                                     | 52                     | 23                      | 125                    | 1                       |
| 25            | 1.5       | B/3528-21               | T491B155(1)025A(2)           | 0.5                                  | 6.0                             | 5.0                              | 130                                    | 117                    | 52                      | 125                    | 1                       |
| 25            | 1.5       | A/3216-18               | T491A155(1)025A(2)           | 0.5                                  | 6.0                             | 7.0                              | 104                                    | 94                     | 42                      | 125                    | 1                       |
| 25            | 2.2       | C/6032-28               | T491C225(1)025A(2)           | 0.6                                  | 6.0                             | 3.5                              | 177                                    | 159                    | 71                      | 125                    | 1                       |
| 25            | 2.2       | A/3216-18               | T491A225(1)025A(2)           | 0.6                                  | 6.0                             | 7.0                              | 104                                    | 94                     | 42                      | 125                    | 1                       |
| 25            | 2.2       | B/3528-21               | T491B225(1)025A(2)           | 0.6                                  | 6.0                             | 4.5                              | 137                                    | 123                    | 55                      | 125                    | 1                       |
| 25            | 3.3       | C/6032-28               | T491C335(1)025A(2)           | 0.8                                  | 6.0                             | 2.5                              | 210                                    | 189                    | 84                      | 125                    | 1                       |
| 25            | 3.3       | A/3216-18               | T491A335(1)025A(2)           | 0.8                                  | 6.0                             | 7.0                              | 104                                    | 94                     | 42                      | 125                    | 1                       |
| 25            | 3.3       | B/3528-21               | T491B335(1)025A(2)           | 0.8                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 25            | 4.7       | C/6032-28               | T491C475(1)025A(2)           | 1.2                                  | 6.0                             | 2.3                              | 214                                    | 193                    | 86                      | 125                    | 1                       |
| 25            | 4.7       | B/3528-21               | T491B475(1)025A(2)           | 1.2                                  | 6.0                             | 1.5                              | 238                                    | 214                    | 95                      | 125                    | 1                       |
| 25            | 4.7       | A/3216-18               | T491A475(1)025A(2)           | 1.2                                  | 8.0                             | 6.0                              | 112                                    | 101                    | 45                      | 125                    | 1                       |
| 25            | 6.8       | D/7343-31               | T491D685(1)025A(2)           | 1.7                                  | 6.0                             | 1.8                              | 289                                    | 260                    | 116                     | 125                    | 1                       |
| 25            | 6.8       | C/6032-28               | T491C685(1)025A(2)           | 1.7                                  | 6.0                             | 1.9                              | 241                                    | 217                    | 96                      | 125                    | 1                       |
| 25            | 6.8       | B/3528-21               | T491B685(1)025A(2)           | 1.7                                  | 6.0                             | 2.8                              | 174                                    | 157                    | 70                      | 125                    | 1                       |
| 25            | 10        | D/7343-31               | T491D106(1)025A(2)           | 2.5                                  | 6.0                             | 1.0                              | 387                                    | 348                    | 155                     | 125                    | 1                       |
| 25            | 10        | C/6032-28               | T491C106(1)025A(2)           | 2.5                                  | 6.0                             | 1.5                              | 271                                    | 244                    | 108                     | 125                    | 1                       |
| 25            | 10        | B/3528-21               | T491B106(1)025A(2)           | 2.5                                  | 6.0                             | 2.0                              | 168                                    | 151                    | 67                      | 125                    | 1                       |
| 25            | 15        | D/7343-31               | T491D156(1)025A(2)           | 3.8                                  | 6.0                             | 1.0                              | 387                                    | 348                    | 155                     | 125                    | 1                       |
| 25            | 15        | V/7343-20               | T491V156(1)025A(2)           | 3.8                                  | 6.0                             | 1.0                              | 354                                    | 319                    | 142                     | 125                    | 1                       |
| 25            | 15        | C/6032-28               | T491C156(1)025A(2)           | 3.8                                  | 6.0                             | 1.5                              | 271                                    | 244                    | 108                     | 125                    | 1                       |
| 25            | 15        | B/3528-21               | T491B156(1)025A(2)           | 3.8                                  | 8.0                             | 4.0                              | 146                                    | 131                    | 58                      | 125                    | 1                       |
| 25            | 22        | D/7343-31               | T491D226(1)025A(2)           | 5.5                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 25            | 22        | C/6032-28               | T491C226(1)025A(2)           | 5.5                                  | 6.0                             | 1.0                              | 280                                    | 252                    | 112                     | 125                    | 1                       |
| 25            | 22        | V/7343-20               | T491V226(1)025A(2)           | 5.5                                  | 6.0                             | 0.7                              | 423                                    | 381                    | 169                     | 125                    | 1                       |
| 25            | 33        | X/7343-43               | T491X336(1)025A(2)           | 8.3                                  | 6.0                             | 0.7                              | 486                                    | 437                    | 194                     | 125                    | 1                       |
| 25            | 33        | D/7343-31               | T491D336(1)025A(2)           | 8.3                                  | 6.0                             | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 25            | 33        | C/6032-28               | T491C336(1)025A(2)           | 8.3                                  | 6.0                             | 0.9                              | 350                                    | 315                    | 140                     | 125                    | 1                       |
| 25            | 47        | X/7343-43               | T491X476(1)025A(2)           | 11.8                                 | 6.0                             | 0.7                              | 486                                    | 437                    | 194                     | 125                    | 1                       |
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |

(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 details.

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.**

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |
|---------------|-----------|-------------------------|------------------------------|--------------------------------------|---------------------------------|----------------------------------|----------------------------------------|------------------------|-------------------------|------------------------|-------------------------|
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| 25            | 47        | D/7343-31               | T491D476(1)025A(2)           | 11.8                                 | 6.0                             | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 25            | 68        | X/7343-43               | T491X686(1)025A(2)           | 17.0                                 | 6.0                             | 0.7                              | 486                                    | 437                    | 194                     | 125                    | 1                       |
| 25            | 68        | D/7343-31               | T491D686(1)025A(2)           | 17.0                                 | 10.0                            | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 25            | 100       | X/7343-43               | T491X107(1)025A(2)           | 25.0                                 | 8.0                             | 0.3                              | 742                                    | 668                    | 297                     | 125                    | 1                       |
| 25            | 100       | E/7360-38               | T491E107(1)025A(2)           | 25.0                                 | 8.0                             | 0.5                              | 632                                    | 569                    | 253                     | 125                    | 1                       |
| 35            | 0.1       | A/3216-18               | T491A104(1)035A(2)           | 0.5                                  | 4.0                             | 20.0                             | 61                                     | 55                     | 24                      | 125                    | 1                       |
| 35            | 0.15      | A/3216-18               | T491A154(1)035A(2)           | 0.5                                  | 4.0                             | 19.0                             | 63                                     | 57                     | 25                      | 125                    | 1                       |
| 35            | 0.22      | A/3216-18               | T491A224(1)035A(2)           | 0.5                                  | 4.0                             | 18.0                             | 65                                     | 59                     | 26                      | 125                    | 1                       |
| 35            | 0.33      | A/3216-18               | T491A334(1)035A(2)           | 0.5                                  | 4.0                             | 15.0                             | 71                                     | 64                     | 28                      | 125                    | 1                       |
| 35            | 0.47      | B/3528-21               | T491B474(1)035A(2)           | 0.5                                  | 4.0                             | 8.0                              | 103                                    | 93                     | 41                      | 125                    | 1                       |
| 35            | 0.47      | A/3216-18               | T491A474(1)035A(2)           | 0.5                                  | 4.0                             | 11.0                             | 79                                     | 71                     | 32                      | 125                    | 1                       |
| 35            | 0.68      | B/3528-21               | T491B684(1)035A(2)           | 0.5                                  | 4.0                             | 6.5                              | 114                                    | 103                    | 46                      | 125                    | 1                       |
| 35            | 0.68      | A/3216-18               | T491A684(1)035A(2)           | 0.5                                  | 4.0                             | 8.0                              | 97                                     | 87                     | 39                      | 125                    | 1                       |
| 35            | 1         | B/3528-21               | T491B105(1)035A(2)           | 0.5                                  | 4.0                             | 5.0                              | 130                                    | 117                    | 52                      | 125                    | 1                       |
| 35            | 1         | A/3216-18               | T491A105(1)035A(2)           | 0.5                                  | 4.0                             | 7.0                              | 100                                    | 90                     | 40                      | 125                    | 1                       |
| 35            | 1.5       | A/3216-18               | T491A155(1)035A(2)           | 0.5                                  | 6.0                             | 7.0                              | 104                                    | 94                     | 42                      | 125                    | 1                       |
| 35            | 1.5       | C/6032-28               | T491C155(1)035A(2)           | 0.5                                  | 6.0                             | 4.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 35            | 1.5       | B/3528-21               | T491B155(1)035A(2)           | 0.5                                  | 6.0                             | 5.0                              | 130                                    | 117                    | 52                      | 125                    | 1                       |
| 35            | 2.2       | C/6032-28               | T491C225(1)035A(2)           | 0.8                                  | 6.0                             | 3.2                              | 185                                    | 167                    | 74                      | 125                    | 1                       |
| 35            | 2.2       | A/3216-18               | T491A225(1)035A(2)           | 0.8                                  | 6.0                             | 4.0                              | 129                                    | 116                    | 52                      | 125                    | 1                       |
| 35            | 2.2       | B/3528-21               | T491B225(1)035A(2)           | 0.8                                  | 6.0                             | 4.0                              | 146                                    | 131                    | 58                      | 125                    | 1                       |
| 35            | 3.3       | C/6032-28               | T491C335(1)035A(2)           | 1.2                                  | 6.0                             | 2.0                              | 235                                    | 212                    | 94                      | 125                    | 1                       |
| 35            | 3.3       | B/3528-21               | T491B335(1)035A(2)           | 1.2                                  | 6.0                             | 3.5                              | 156                                    | 140                    | 62                      | 125                    | 1                       |
| 35            | 3.3       | D/7343-31               | T491D335(1)035A(2)           | 1.2                                  | 6.0                             | 2.0                              | 274                                    | 247                    | 110                     | 125                    | 1                       |
| 35            | 4.7       | D/7343-31               | T491D475(1)035A(2)           | 1.6                                  | 6.0                             | 1.5                              | 316                                    | 284                    | 126                     | 125                    | 1                       |
| 35            | 4.7       | B/3528-21               | T491B475(1)035A(2)           | 1.6                                  | 6.0                             | 3.0                              | 166                                    | 149                    | 66                      | 125                    | 1                       |
| 35            | 4.7       | C/6032-28               | T491C475(1)035A(2)           | 1.6                                  | 6.0                             | 2.0                              | 224                                    | 202                    | 90                      | 125                    | 1                       |
| 35            | 6.8       | D/7343-31               | T491D685(1)035A(2)           | 2.4                                  | 6.0                             | 1.2                              | 340                                    | 306                    | 136                     | 125                    | 1                       |
| 35            | 6.8       | V/7343-20               | T491V685(1)035A(2)           | 2.4                                  | 6.0                             | 1.2                              | 323                                    | 291                    | 129                     | 125                    | 1                       |
| 35            | 6.8       | C/6032-28               | T491C685(1)035A(2)           | 2.4                                  | 6.0                             | 1.8                              | 247                                    | 222                    | 99                      | 125                    | 1                       |
| 35            | 10        | D/7343-31               | T491D106(1)035A(2)           | 3.5                                  | 6.0                             | 1.0                              | 387                                    | 348                    | 155                     | 125                    | 1                       |
| 35            | 10        | C/6032-28               | T491C106(1)035A(2)           | 3.5                                  | 6.0                             | 1.6                              | 262                                    | 236                    | 105                     | 125                    | 1                       |
| 35            | 10        | V/7343-20               | T491V106(1)035A(2)           | 3.5                                  | 6.0                             | 1.0                              | 250                                    | 225                    | 100                     | 125                    | 1                       |
| 35            | 15        | C/6032-28               | T491C156(1)035A(2)           | 5.3                                  | 6.0                             | 1.0                              | 332                                    | 299                    | 133                     | 125                    | 1                       |
| 35            | 15        | X/7343-43               | T491X156(1)035A(2)           | 5.3                                  | 6.0                             | 0.9                              | 428                                    | 385                    | 171                     | 125                    | 1                       |
| 35            | 15        | D/7343-31               | T491D156(1)035A(2)           | 5.3                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 35            | 22        | X/7343-43               | T491X226(1)035A(2)           | 7.7                                  | 6.0                             | 0.7                              | 486                                    | 437                    | 194                     | 125                    | 1                       |
| 35            | 22        | D/7343-31               | T491D226(1)035A(2)           | 7.7                                  | 6.0                             | 0.7                              | 463                                    | 417                    | 185                     | 125                    | 1                       |
| 35            | 33        | X/7343-43               | T491X336(1)035A(2)           | 11.6                                 | 6.0                             | 0.6                              | 524                                    | 472                    | 210                     | 125                    | 1                       |
| 35            | 33        | D/7343-31               | T491D336(1)035A(2)           | 11.6                                 | 6.0                             | 0.6                              | 500                                    | 450                    | 200                     | 125                    | 1                       |
| 35            | 47        | X/7343-43               | T491X476(1)035A(2)           | 16.5                                 | 6.0                             | 0.6                              | 524                                    | 472                    | 210                     | 125                    | 1                       |
| 35            | 47        | E/7360-38               | T491E476(1)035A(2)           | 16.5                                 | 10.0                            | 0.5                              | 632                                    | 569                    | 253                     | 125                    | 1                       |
| 50            | 0.1       | A/3216-18               | T491A104(1)050A(2)           | 0.5                                  | 4.0                             | 20.0                             | 61                                     | 55                     | 24                      | 125                    | 1                       |
| 50            | 0.15      | B/3528-21               | T491B154(1)050A(2)           | 0.5                                  | 4.0                             | 16.0                             | 73                                     | 66                     | 29                      | 125                    | 1                       |
| 50            | 0.15      | A/3216-18               | T491A154(1)050A(2)           | 0.5                                  | 4.0                             | 15.0                             | 71                                     | 64                     | 28                      | 125                    | 1                       |
| 50            | 0.22      | B/3528-21               | T491B224(1)050A(2)           | 0.5                                  | 4.0                             | 14.0                             | 78                                     | 70                     | 31                      | 125                    | 1                       |
| VDC at 85°C   | μF        | KEMET/EIA               | (See below for part options) | μA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |

(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 details.

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.**

| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |
|---------------|-----------|-------------------------|------------------------------|--------------------------------------|---------------------------------|----------------------------------|----------------------------------------|------------------------|-------------------------|------------------------|-------------------------|
| VDC at 85°C   | µF        | KEMET/EIA               | (See below for part options) | µA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| 50            | 0.22      | A/3216-18               | T491A224(1)050A(2)           | 0.5                                  | 4.0                             | 18.0                             | 65                                     | 59                     | 26                      | 125                    | 1                       |
| 50            | 0.33      | A/3216-18               | T491A334(1)050A(2)           | 0.5                                  | 4.0                             | 14.0                             | 73                                     | 66                     | 29                      | 125                    | 1                       |
| 50            | 0.33      | B/3528-21               | T491B334(1)050A(2)           | 0.5                                  | 4.0                             | 10.0                             | 92                                     | 83                     | 37                      | 125                    | 1                       |
| 50            | 0.47      | A/3216-18               | T491A474(1)050A(2)           | 0.5                                  | 4.0                             | 9.5                              | 280                                    | 253                    | 112                     | 125                    | 1                       |
| 50            | 0.47      | C/6032-28               | T491C474(1)050A(2)           | 0.5                                  | 4.0                             | 7.2                              | 117                                    | 105                    | 47                      | 125                    | 1                       |
| 50            | 0.47      | B/3528-21               | T491B474(1)050A(2)           | 0.5                                  | 4.0                             | 9.0                              | 97                                     | 87                     | 39                      | 125                    | 1                       |
| 50            | 0.68      | A/3216-18               | T491A684(1)050A(2)           | 0.5                                  | 4.0                             | 8.0                              | 97                                     | 87                     | 39                      | 125                    | 1                       |
| 50            | 0.68      | C/6032-28               | T491C684(1)050A(2)           | 0.5                                  | 4.0                             | 6.4                              | 125                                    | 113                    | 50                      | 125                    | 1                       |
| 50            | 0.68      | B/3528-21               | T491B684(1)050A(2)           | 0.5                                  | 4.0                             | 8.0                              | 103                                    | 93                     | 41                      | 125                    | 1                       |
| 50            | 1         | A/3216-18               | T491A105(1)050A(2)           | 0.5                                  | 4.0                             | 7.0                              | 104                                    | 94                     | 42                      | 125                    | 1                       |
| 50            | 1         | C/6032-28               | T491C105(1)050A(2)           | 0.5                                  | 4.0                             | 4.8                              | 148                                    | 133                    | 59                      | 125                    | 1                       |
| 50            | 1         | B/3528-21               | T491B105(1)050A(2)           | 0.5                                  | 6.0                             | 6.0                              | 119                                    | 107                    | 48                      | 125                    | 1                       |
| 50            | 1         | V/7343-20               | T491V105(1)050A(2)           | 0.5                                  | 4.0                             | 6.0                              | 144                                    | 130                    | 58                      | 125                    | 1                       |
| 50            | 1.5       | D/7343-31               | T491D155(1)050A(2)           | 0.8                                  | 6.0                             | 3.5                              | 207                                    | 186                    | 83                      | 125                    | 1                       |
| 50            | 1.5       | C/6032-28               | T491C155(1)050A(2)           | 0.8                                  | 6.0                             | 4.0                              | 166                                    | 149                    | 66                      | 125                    | 1                       |
| 50            | 2.2       | D/7343-31               | T491D225(1)050A(2)           | 1.1                                  | 6.0                             | 2.5                              | 245                                    | 221                    | 98                      | 125                    | 1                       |
| 50            | 2.2       | C/6032-28               | T491C225(1)050A(2)           | 1.1                                  | 6.0                             | 3.0                              | 191                                    | 172                    | 76                      | 125                    | 1                       |
| 50            | 3.3       | C/6032-28               | T491C335(1)050A(2)           | 1.7                                  | 6.0                             | 2.0                              | 235                                    | 212                    | 94                      | 125                    | 1                       |
| 50            | 3.3       | D/7343-31               | T491D335(1)050A(2)           | 1.7                                  | 6.0                             | 1.6                              | 274                                    | 247                    | 110                     | 125                    | 1                       |
| 50            | 4.7       | C/6032-28               | T491C475(1)050A(2)           | 2.4                                  | 4.0                             | 1.4                              | 280                                    | 252                    | 112                     | 125                    | 1                       |
| 50            | 4.7       | D/7343-31               | T491D475(1)050A(2)           | 2.4                                  | 6.0                             | 1.2                              | 354                                    | 319                    | 142                     | 125                    | 1                       |
| 50            | 6.8       | X/7343-43               | T491X685(1)050A(2)           | 3.4                                  | 6.0                             | 0.8                              | 406                                    | 365                    | 162                     | 125                    | 1                       |
| 50            | 6.8       | D/7343-31               | T491D685(1)050A(2)           | 3.4                                  | 6.0                             | 0.8                              | 387                                    | 348                    | 155                     | 125                    | 1                       |
| 50            | 10        | X/7343-43               | T491X106(1)050A(2)           | 5.0                                  | 6.0                             | 0.7                              | 486                                    | 437                    | 194                     | 125                    | 1                       |
| 50            | 10        | D/7343-31               | T491D106(1)050A(2)           | 5.0                                  | 6.0                             | 0.8                              | 433                                    | 390                    | 173                     | 125                    | 1                       |
| 50            | 15        | X/7343-43               | T491X156(1)050A(2)           | 7.5                                  | 8.0                             | 0.7                              | 486                                    | 437                    | 194                     | 125                    | 1                       |
| 50            | 22        | X/7343-43               | T491X226(1)050A(2)           | 11.0                                 | 10.0                            | 0.6                              | 524                                    | 472                    | 210                     | 125                    | 1                       |
| VDC at 85°C   | µF        | KEMET/EIA               | (See below for part options) | µA at +25°C<br>Maximum/<br>5 Minutes | % at +25°C<br>120 Hz<br>Maximum | Ω at +25°C<br>100 kHz<br>Maximum | mA at +25°C<br>100 kHz                 | mA at +85°C<br>100 kHz | mA at +125°C<br>100 kHz | °C                     | Reflow Temp<br>≤ 260 °C |
| Rated Voltage | Rated Cap | Case Code/<br>Case Size | KEMET Part Number            | DC Leakage                           | DF                              | ESR                              | Maximum Allowable Ripple Current (rms) |                        |                         | Maximum Operating Temp | MSL                     |

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

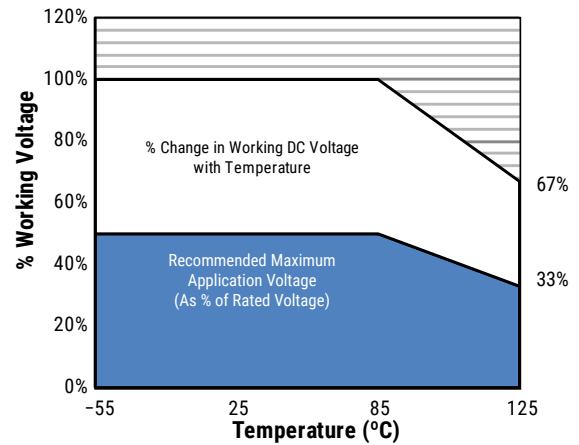
(2) To complete KEMET part number, insert T = 100% Matte Tin (Sn)-plated, G = Gold-plated, H = Standard solder coated (SnPb 5% Pb minimum), N = Non-magnetic 100% Tin (Sn), M = Non-magnetic (SnPb). Designates Termination Finish.

Refer to Ordering Information for additional details.

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 <sub>R</sub>        | 67% of V <sub>R</sub> |
| Recommended maximum application voltage         | 50% of V <sub>R</sub> | 33% of V <sub>R</sub> |



## Ripple Current/Ripple Voltage

Permissible AC ripple voltage and current are related to equivalent series resistance (ESR) and the power dissipation capabilities of the device. Permissible AC ripple voltage which may be applied is limited by two criteria:

1. The positive peak AC voltage plus the DC bias voltage, if any, must not exceed the DC voltage rating of the capacitor.
2. The negative peak AC voltage in combination with bias voltage, if any, must not exceed the allowable limits specified for the reverse voltage. See the Reverse Voltage section for allowable limits.

The maximum power dissipation by case size can be determined using the table at right. The maximum power dissipation rating stated in the table must be reduced with increasing environmental operating temperatures. Refer to the table below for temperature compensation requirements.

| Temperature Compensation Multipliers<br>for Maximum Ripple Current |          |           |
|--------------------------------------------------------------------|----------|-----------|
| T ≤ 25°C                                                           | T ≤ 85°C | T ≤ 125°C |
| 1.00                                                               | 0.90     | 0.40      |

T = Environmental Temperature

The maximum power dissipation rating must be reduced with increasing environmental operating temperatures. Refer to the Temperature Compensation Multiplier table for details.

| KEMET<br>Case Code | EIA<br>Case Code | Maximum Power<br>Dissipation (P max)<br>mWatts at 25°C<br>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                                                                    |
| M                  | 3528-15          | 120                                                                    |
| S                  | 3216-12          | 60                                                                     |
| T                  | 3528-12          | 70                                                                     |
| U                  | 6032-15          | 90                                                                     |
| V                  | 7343-20          | 125                                                                    |
| W                  | 7343-15          | 180                                                                    |
| T510X              | 7343-43          | 270                                                                    |
| T510E              | 7360-38          | 285                                                                    |

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

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

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

I = rms ripple current (amperes)  
E = rms ripple voltage (volts)  
P max = maximum power dissipation (watts)  
R = ESR at specified frequency (ohms)  
Z = Impedance 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**

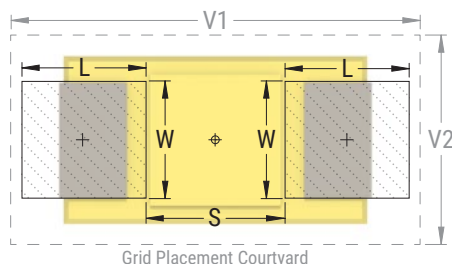
| KEMET          | Metric Size Code | Density Level A:<br>Maximum (Most) Land Protrusion (mm) |      |      |       |      | Density Level B:<br>Median (Nominal) Land Protrusion (mm) |      |      |      |      | Density Level C:<br>Minimum (Least) Land Protrusion (mm) |      |      |      |      |
|----------------|------------------|---------------------------------------------------------|------|------|-------|------|-----------------------------------------------------------|------|------|------|------|----------------------------------------------------------|------|------|------|------|
|                |                  | W                                                       | L    | S    | V1    | V2   | W                                                         | L    | S    | V1   | V2   | W                                                        | L    | S    | V1   | V2   |
| A              | 3216-18          | 1.35                                                    | 2.20 | 0.62 | 6.02  | 2.80 | 1.23                                                      | 1.80 | 0.82 | 4.92 | 2.30 | 1.13                                                     | 1.42 | 0.98 | 4.06 | 2.04 |
| B              | 3528-21          | 2.35                                                    | 2.21 | 0.92 | 6.32  | 4.00 | 2.23                                                      | 1.80 | 1.12 | 5.22 | 3.50 | 2.13                                                     | 1.42 | 1.28 | 4.36 | 3.24 |
| C              | 6032-28          | 2.35                                                    | 2.77 | 2.37 | 8.92  | 4.50 | 2.23                                                      | 2.37 | 2.57 | 7.82 | 4.00 | 2.13                                                     | 1.99 | 2.73 | 6.96 | 3.74 |
| D              | 7343-31          | 2.55                                                    | 2.77 | 3.67 | 10.22 | 5.60 | 2.43                                                      | 2.37 | 3.87 | 9.12 | 5.10 | 2.33                                                     | 1.99 | 4.03 | 8.26 | 4.84 |
| M              | 3528-15          | 2.35                                                    | 2.20 | 0.92 | 6.32  | 4.00 | 2.23                                                      | 1.80 | 1.12 | 5.22 | 3.50 | 2.13                                                     | 1.42 | 1.28 | 4.36 | 3.24 |
| S <sup>2</sup> | 3216-12          | 1.35                                                    | 2.20 | 0.62 | 6.02  | 2.80 | 1.23                                                      | 1.80 | 0.82 | 4.92 | 2.30 | 1.13                                                     | 1.42 | 0.98 | 4.06 | 2.04 |
| T              | 3528-12          | 2.35                                                    | 2.20 | 0.92 | 6.32  | 4.00 | 2.23                                                      | 1.80 | 1.12 | 5.22 | 3.50 | 2.13                                                     | 1.42 | 1.28 | 4.36 | 3.24 |
| U              | 6032-15          | 2.35                                                    | 2.77 | 2.37 | 8.92  | 4.50 | 2.23                                                      | 2.37 | 2.57 | 7.82 | 4.00 | 2.13                                                     | 1.99 | 2.73 | 6.96 | 3.74 |
| V              | 7343-21          | 2.55                                                    | 2.77 | 3.67 | 10.22 | 5.60 | 2.43                                                      | 2.37 | 3.87 | 9.12 | 5.10 | 2.33                                                     | 1.99 | 4.03 | 8.26 | 4.84 |
| W              | 7343-15          | 2.55                                                    | 2.77 | 3.67 | 10.22 | 5.60 | 2.43                                                      | 2.37 | 3.87 | 9.12 | 5.10 | 2.33                                                     | 1.99 | 4.03 | 8.26 | 4.84 |
| X <sup>1</sup> | 7343-43          | 2.55                                                    | 2.77 | 3.67 | 10.22 | 5.60 | 2.43                                                      | 2.37 | 3.87 | 9.12 | 5.10 | 2.33                                                     | 1.99 | 4.03 | 8.26 | 4.84 |

**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

The KEMET 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.

Please 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.

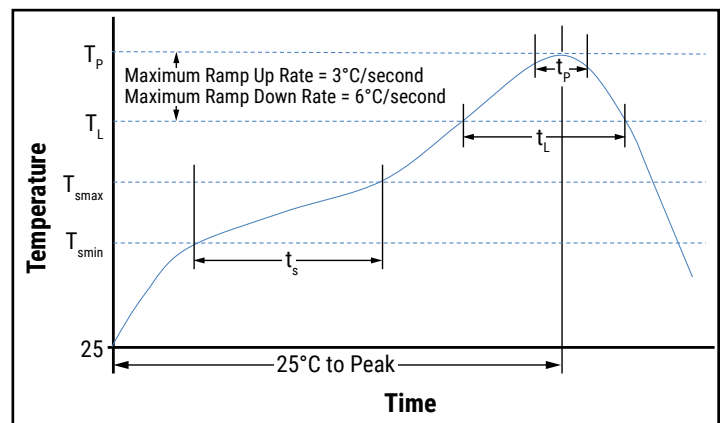
During typical reflow operations, a slight darkening of the gold-colored epoxy may be observed. This slight darkening is normal and not harmful to the product. Marking permanency is not affected by this change.

| Profile Feature                                       | SnPb Assembly      | Pb-Free Assembly   |
|-------------------------------------------------------|--------------------|--------------------|
| <b>Preheat/Soak</b>                                   |                    |                    |
| 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/second maximum | 3°C/second 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/second maximum | 6°C/second 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.*

\* For Case Size height > 2.5 mm

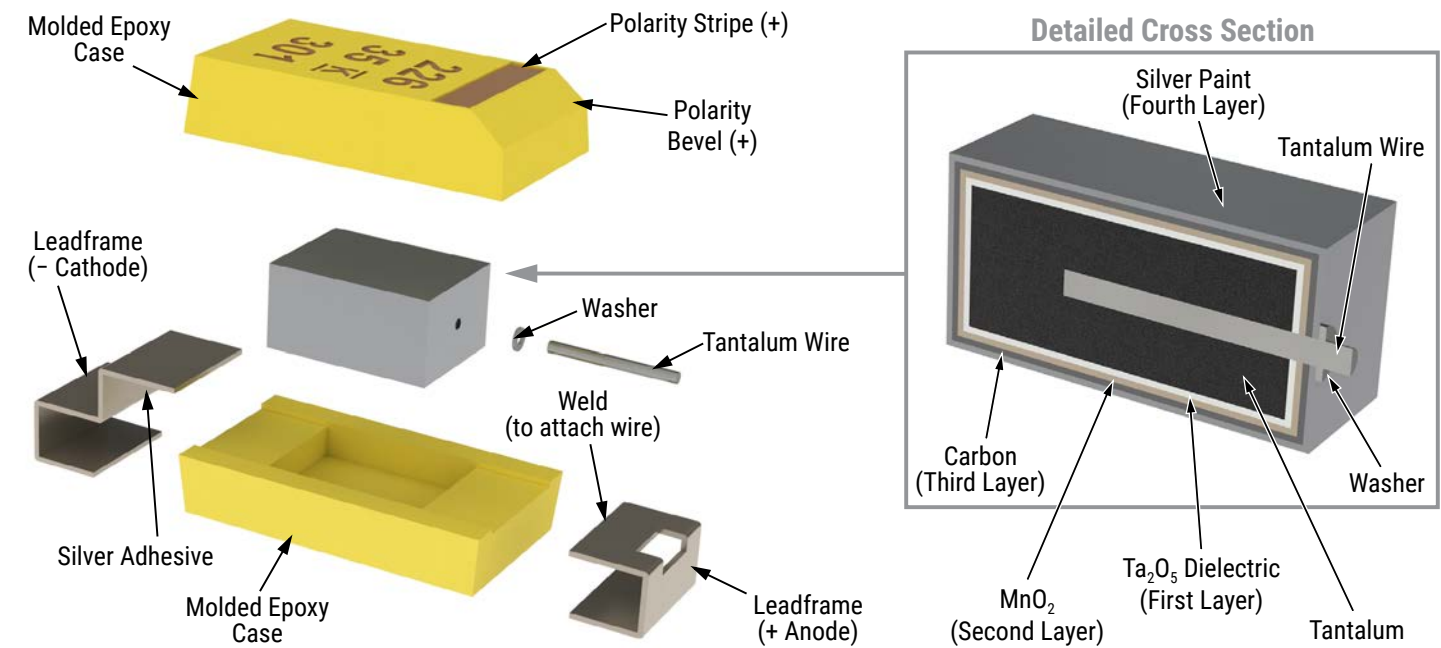
\*\* For Case Size height ≤ 2.5 mm



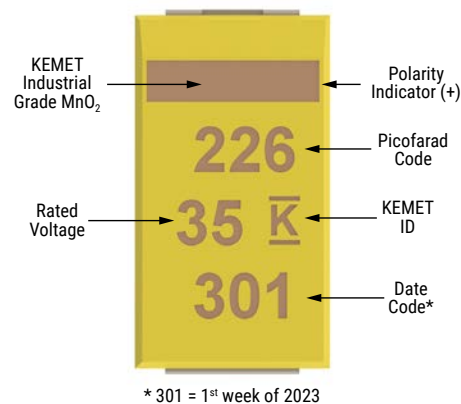
## Storage

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.

Construction



Capacitor Marking



| Date Code *                                                  |                                                                                    |
|--------------------------------------------------------------|------------------------------------------------------------------------------------|
| 1 <sup>st</sup> digit = last number of year                  | 8 = 2018<br>9 = 2019<br>0 = 2020<br>1 = 2021<br>2 = 2022<br>3 = 2023               |
| 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 |

## Tape & Reel Packaging Information

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

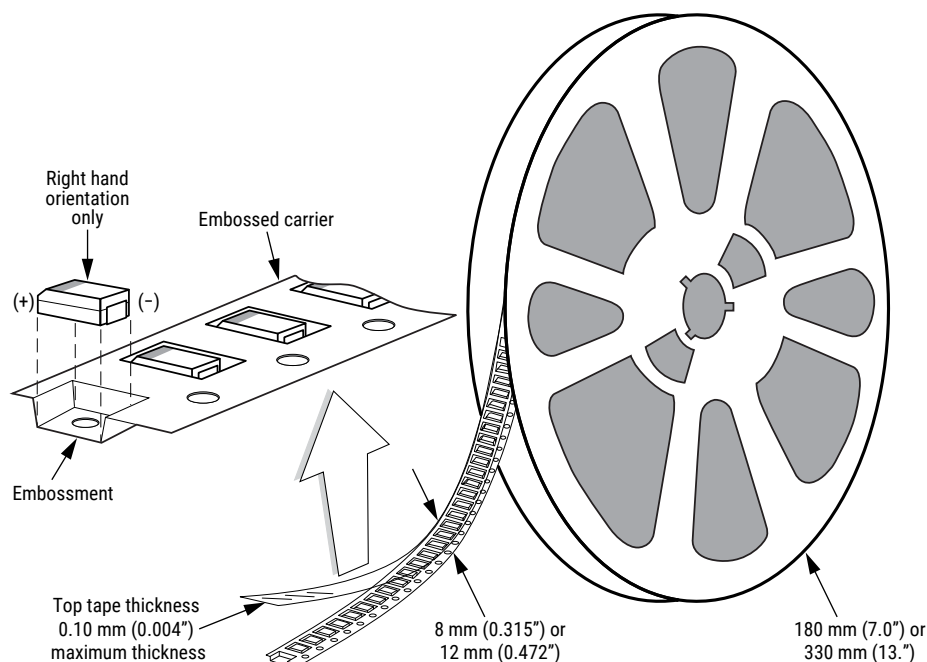


**Table 3 – Packaging Quantity**

| Case Code |         | Tape Width (mm) | 7" Reel* | 13" Reel* |
|-----------|---------|-----------------|----------|-----------|
| KEMET     | EIA     |                 |          |           |
| S         | 3216-12 | 8               | 2,500    | 10,000    |
| T         | 3528-12 | 8               | 3,000    | 10,000    |
| M         | 3528-15 | 8               | 2,500    | 8,000     |
| U         | 6032-15 | 12              | 1,000    | 5,000     |
| L         | 6032-19 | 12              | 1,000    | 3,000     |
| 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     |
| Q         | 7343-12 | 12              | 1,000    | 3,000     |
| 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     |
| O         | 7360-43 | 12              | 250      | 1,000     |

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

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

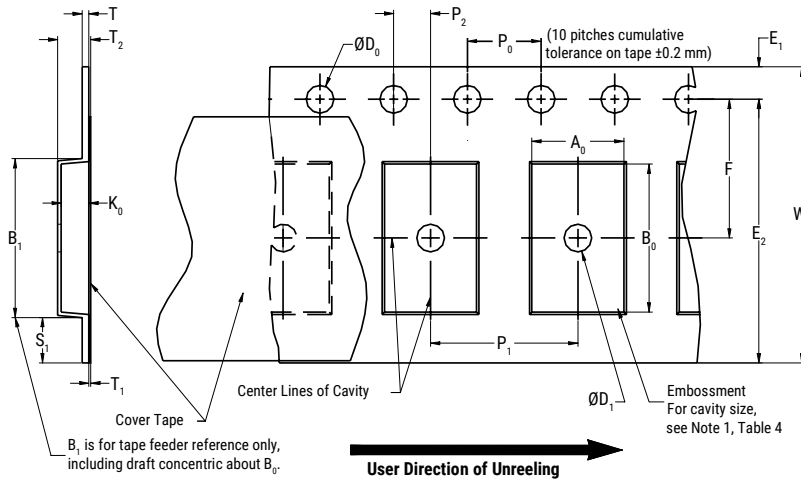


**Table 4 – Embossed (Plastic) Carrier Tape Dimensions**

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)         |                                  |                  |                        |

| 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>and Double<br>(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) |                                                  |  |

1. 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.
2. The tape, with or without components, shall pass around R without damage (see Figure 4).
3. 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).
4. B<sub>1</sub> dimension is a reference dimension for tape feeder clearance only.
5. 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:
  - (a) the component does not protrude above the top surface of the carrier tape.
  - (b) the component can be removed from the cavity in a vertical direction without mechanical restriction, after the top cover tape has been removed.
  - (c) rotation of the component is limited to 20° maximum for 8 and 12 mm tapes (see Figure 2).
  - (d) lateral movement of the component is restricted to 0.5 mm maximum for 8 mm and 12 mm wide tape (see Figure 3).
  - (e) see Addendum in EIA Standard 481-D for standards relating to more precise taping requirements.

## Packaging Information Performance Notes

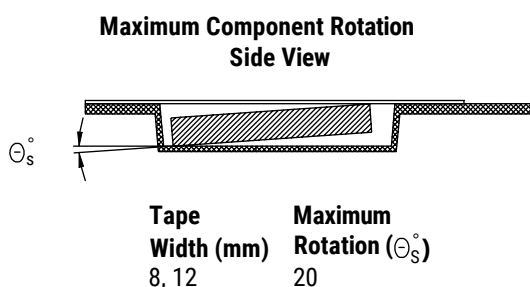
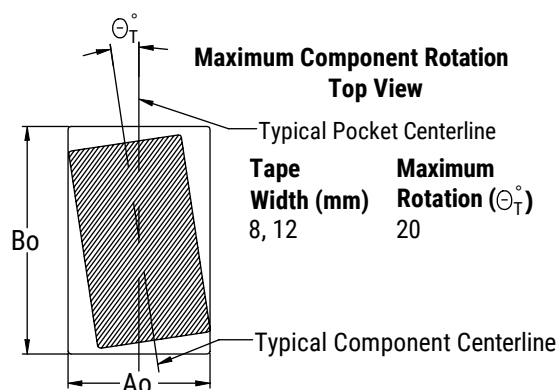
- Cover tape break force:** 1.0 kg minimum.
- Cover tape peel strength:** The total peel strength of the cover tape from the carrier tape shall be:

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

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



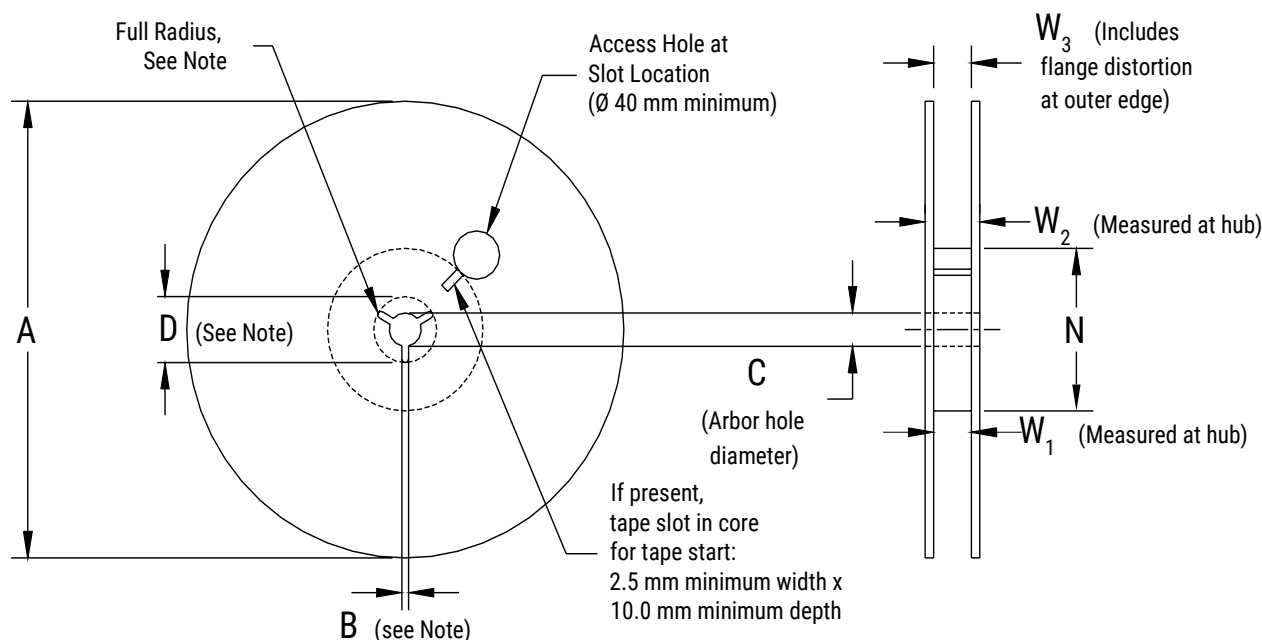
## Figure 3 – Maximum Lateral Movement



## 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)<br>or<br>330 ±0.20<br>(13.000 ±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                                      |                                                                   |                                       |                                        |                                                   |
| 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 without interference |
| 12 mm                                      |                                                                   | 12.4 +2.0/-0.0<br>(0.488 +0.078/-0.0) | 18.4<br>(0.724)                        |                                                   |

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

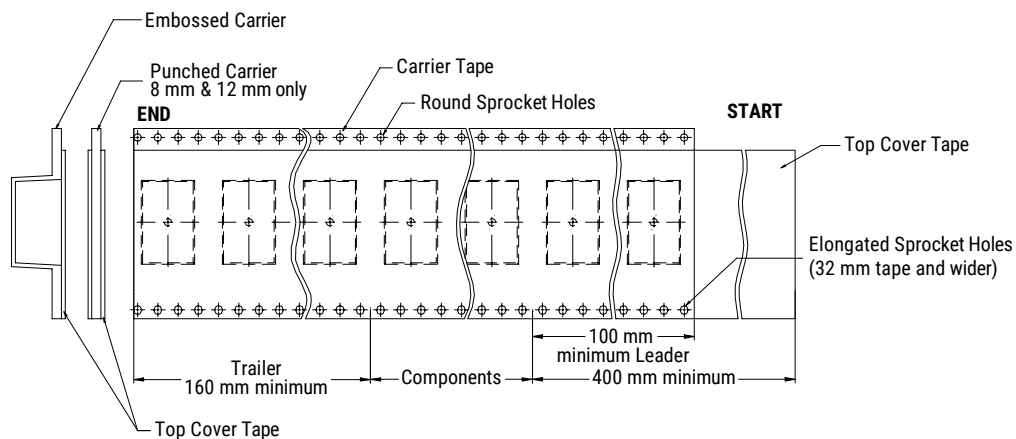
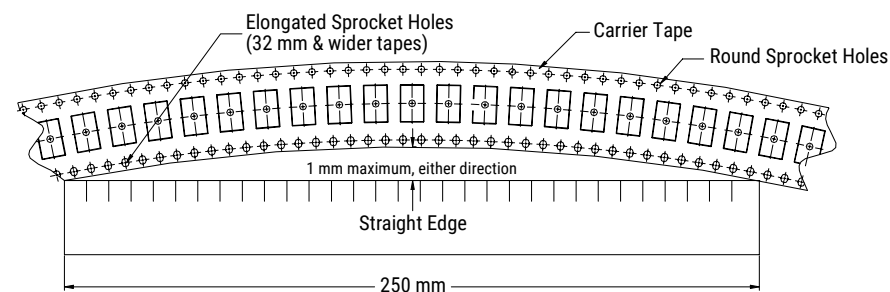


**Figure 7 – Maximum Camber**



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