

## Overview

The hermetically sealed T252 Series solid tantalum capacitors offer high capacitance-to-volume ratios and are offered in standard MIL style A, B, C, and D cases. They meet or exceed the environmental and mechanical requirements of MIL–C–39003. Designed to operate from -55°C to +125°C, The T252 Series exhibits exceptionally low DC leakage, dissipation

factor and impedance characteristics. They are ideal for coupling, bypass, filtering and timing circuits, and are excellent substitutes for wet tantalum's in low voltage applications. These parts are available in style CSR33 (T252 Series) per MIL–PRF–39003/06 in capacitance value of 1.2  $\mu$ F to 1000  $\mu$ F and working voltages pF 6 VDC to 50 VDC.

## Benefits

- Taped and reeled per EIA Specification RS–296
- Marking per MIL–STD–1285
- Qualified to MIL–PRF–39003 (CSR33 Style)
- Failure rate options: Graded - B, C, D and G  
Exponential - M, P, R, and S\*
- Capacitance values of 1.2  $\mu$ F to 1000  $\mu$ F
- Tolerances of  $\pm 10\%$  and  $\pm 20\%$
- Voltage rating of 6 – 50 VDC
- Operating temperature range of -55°C to +125°C
- Case sizes: A, B, C, D

*\*Failure rates apply to military products only*



## Applications

These capacitors are ideal for coupling, bypass, filtering and timing circuits, and are excellent substitutes for wet tantalum's in low voltage applications.

## Ordering Information

| T               | 252         | A          | 125                                                                                    | K                                | 050                                                                 | M                                                                                                                                                                       | S                  | C                                                                                                                                                                                                                                                      |
|-----------------|-------------|------------|----------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Capacitor Class | Series      | Case Size  | Capacitance Code (pF)                                                                  | Capacitance Tolerance            | Rated Voltage (VDC)                                                 | Failure Rate/Military Product Only                                                                                                                                      | Termination Finish | Specification                                                                                                                                                                                                                                          |
| T = Tantalum    | 252 (CSR33) | A, B, C, D | First two digits represent significant figures. Third digit specifies number of zeros. | K = $\pm 10\%$<br>M = $\pm 20\%$ | 006 = 6<br>010 = 10<br>015 = 15<br>020 = 20<br>035 = 35<br>050 = 50 | Graded:<br>B = 0.1%/k hours<br>C = 0.01%/k hours<br>D = 0.001%/k hours<br>Exponential:<br>M = 1%/k hours<br>P = 0.1%/k hours<br>R = 0.01%/k hours<br>S = 0.001%/k hours | S = Standard       | All capacitors are sleeved unless specified.<br>0100 = Without sleeve<br>7200 = Tape & Reel<br>7293 & 7443 = Ammo<br>4250 = 10 cycles, 25°C after Weibull<br>4251 = 10 cycles, -55 & 85°C after Weibull<br>4252 = 10 cycles, -55 & 85°C before Weibull |

## Ordering Information – T252 (CSR33 Style)

MIL product

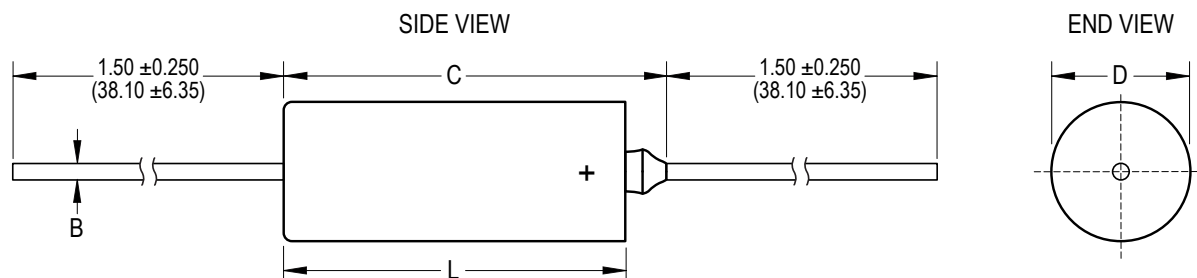
| M39003                        | /06                        | 4073               | B                        |
|-------------------------------|----------------------------|--------------------|--------------------------|
| Capacitor Class               | Slash                      | Dash Number        | Surge Option             |
| Military Specification Number | Specification Sheet Number | Failure Rate Level | B = C-4251<br>C = C-4252 |

Orders should be entered by the military specification number, including the dash number and surge option letter (B, or C).

## Performance Characteristics

| Item                                            | Performance Characteristics                                                                                                  |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Operating Temperature                           | -55°C to 125°C                                                                                                               |
| Rated Capacitance Range                         | 1.2 – 1,000 $\mu$ F at 120 Hz/25°C                                                                                           |
| Capacitance Tolerance                           | K Tolerance (10%), M Tolerance (20%)                                                                                         |
| Rated Voltage Range                             | 6 – 50 V                                                                                                                     |
| DF (120 Hz at 25°C)                             | Refer to Part Number Electrical Specification Table                                                                          |
| ESR and Impedance (100 kHz at 25°C)             | Refer to Part Number Electrical Specification Table (for reference only)                                                     |
| Leakage Current                                 | Refer to Part Number Electrical Specification Table (at rated voltage up to +85°C and 2/3 of rated voltage applied at 125°C) |
| Failure Rate (MIL-39003, CSR13 capacitors only) | Approved failure rate: S (0.001%/k hours) - Exponential, D (0.001%/k hours) - Graded                                         |

## Dimensions – Inches (Millimeters)



| Case Size | Uninsulated         |                     | Insulated           |                     | B ±0.002<br>±(0.05) | C<br>Maximum     |
|-----------|---------------------|---------------------|---------------------|---------------------|---------------------|------------------|
|           | D ±0.005<br>±(0.13) | L ±0.031<br>±(0.79) | D ±0.010<br>±(0.25) | L ±0.031<br>±(0.79) |                     |                  |
| A         | 0.125<br>(3.18)     | 0.250<br>(6.35)     | 0.135<br>(3.43)     | 0.286<br>(7.26)     | 0.020<br>(.51)      | 0.422<br>(10.72) |
| B         | 0.175<br>(4.45)     | 0.438<br>(11.13)    | 0.185<br>(4.70)     | 0.474<br>(12.04)    | 0.020<br>(.51)      | 0.610<br>(15.49) |
| C         | 0.279<br>(7.09)     | 0.650<br>(16.51)    | 0.289<br>(7.34)     | 0.686<br>(17.42)    | 0.025<br>(.64)      | 0.822<br>(20.88) |
| D         | 0.341<br>(8.66)     | 0.750<br>(19.05)    | 0.351<br>(8.92)     | 0.786<br>(19.96)    | 0.025<br>(.64)      | 0.922<br>(23.42) |

Table 1 – Ratings &amp; Part Number Reference

| Rated Voltage | Rated Capacitance | Case Size Code | DC Leakage               | DF % at 25°C   | MIL-PRF-39003 (CSR33) Capacitors   |         |          |           |                  |         |          |           |                  | KEMET Equivalent Military |
|---------------|-------------------|----------------|--------------------------|----------------|------------------------------------|---------|----------|-----------|------------------|---------|----------|-----------|------------------|---------------------------|
|               |                   |                |                          |                | Dash Number Reference              |         |          |           |                  |         |          |           |                  |                           |
|               |                   |                |                          |                | Failure Rate Level (%/1,000 Hours) |         |          |           |                  |         |          |           |                  |                           |
|               |                   |                |                          |                | MIL-PRF-39003/6F                   |         |          |           | MIL-PRF-39003/6F |         |          |           |                  |                           |
|               |                   |                |                          |                | Exponential                        |         |          |           | Graded           |         |          |           |                  |                           |
| VDC           | µF                |                | µA at 25°C Max/5 Minutes | 120 Hz Maximum | M (1.0)                            | P (0.1) | R (0.01) | S (0.001) | G (1)            | B (0.1) | C (0.01) | D (0.001) | Part Number      |                           |
| 6             | 10.0              | A              | 0.5                      | 6              | 0001                               | 0101    | 0201     | 0301      | 5001             | 2001    | 3001     | 4001      | T252A106K006(1)S |                           |
| 6             | 10.0              | A              | 0.5                      | 6              | 0002                               | 0102    | 0202     | 0302      | 5002             | 2002    | 3002     | 4002      | T252A106M006(1)S |                           |
| 6             | 12.0              | A              | 0.5                      | 6              | 0003                               | 0103    | 0203     | 0303      | 5003             | 2003    | 3003     | 4003      | T252A126K006(1)S |                           |
| 6             | 100.0             | B              | 1.0                      | 8              | 0004                               | 0104    | 0204     | 0304      | 5004             | 2004    | 3004     | 4004      | T252B107K006(1)S |                           |
| 6             | 100.0             | B              | 1.0                      | 8              | 0005                               | 0105    | 0205     | 0305      | 5005             | 2005    | 3005     | 4005      | T252B107M006(1)S |                           |
| 6             | 330.0             | C              | 2.0                      | 8              | 0006                               | 0106    | 0206     | 0306      | 5006             | 2006    | 3006     | 4006      | T252C337K006(1)S |                           |
| 6             | 330.0             | C              | 2.0                      | 8              | 0007                               | 0107    | 0207     | 0307      | 5007             | 2007    | 3007     | 4007      | T252C337M006(1)S |                           |
| 6             | 390.0             | C              | 2.0                      | 10             | 0008                               | 0108    | 0208     | 0308      | 5008             | 2008    | 3008     | 4008      | T252C397K006(1)S |                           |
| 6             | 470.0             | C              | 2.0                      | 10             | 0009                               | 0109    | 0209     | 0309      | 5009             | 2009    | 3009     | 4009      | T252C477K006(1)S |                           |
| 6             | 470.0             | C              | 2.0                      | 10             | 0010                               | 0110    | 0210     | 0310      | 5010             | 2010    | 3010     | 4010      | T252C477M006(1)S |                           |
| 6             | 680.0             | D              | 5.0                      | 10             | 0011                               | 0111    | 0211     | 0311      | 5011             | 2011    | 3011     | 4011      | T252D687K006(1)S |                           |
| 6             | 680.0             | D              | 5.0                      | 10             | 0012                               | 0112    | 0212     | 0312      | 5012             | 2012    | 3012     | 4012      | T252D687M006(1)S |                           |
| 6             | 820.0             | D              | 5.0                      | 10             | 0013                               | 0113    | 0213     | 0313      | 5013             | 2013    | 3013     | 4013      | T252D827K006(1)S |                           |
| 6             | 1000.0            | D              | 5.0                      | 10             | 0014                               | 0114    | 0214     | 0314      | 5014             | 2014    | 3014     | 4014      | T252D108K006(1)S |                           |
| 6             | 1000.0            | D              | 5.0                      | 10             | 0015                               | 0115    | 0215     | 0315      | 5015             | 2015    | 3015     | 4015      | T252D108M006(1)S |                           |
| 10            | 6.8               | A              | 0.5                      | 6              | 0016                               | 0116    | 0216     | 0316      | 5016             | 2016    | 3016     | 4016      | T252A685K010(1)S |                           |
| 10            | 6.8               | A              | 0.5                      | 6              | 0017                               | 0117    | 0217     | 0317      | 5017             | 2017    | 3017     | 4017      | T252A685M010(1)S |                           |
| 10            | 8.2               | A              | 0.5                      | 6              | 0018                               | 0118    | 0218     | 0318      | 5018             | 2018    | 3018     | 4018      | T252A825K010(1)S |                           |
| 10            | 47.0              | B              | 1.0                      | 6              | 0019                               | 0119    | 0219     | 0319      | 5019             | 2019    | 3019     | 4019      | T252B476K010(1)S |                           |
| 10            | 47.0              | B              | 1.0                      | 6              | 0020                               | 0120    | 0220     | 0320      | 5020             | 2020    | 3020     | 4020      | T252B476M010(1)S |                           |
| 10            | 56.0              | B              | 1.0                      | 6              | 0021                               | 0121    | 0221     | 0321      | 5021             | 2021    | 3021     | 4021      | T252B566K010(1)S |                           |
| 10            | 68.0              | B              | 1.0                      | 6              | 0022                               | 0122    | 0222     | 0322      | 5022             | 2022    | 3022     | 4022      | T252B686K010(1)S |                           |
| 10            | 68.0              | B              | 1.0                      | 6              | 0023                               | 0123    | 0223     | 0323      | 5023             | 2023    | 3023     | 4023      | T252B686M010(1)S |                           |
| 10            | 82.0              | B              | 1.0                      | 6              | 0024                               | 0124    | 0224     | 0324      | 5024             | 2024    | 3024     | 4024      | T252B826K010(1)S |                           |
| 10            | 220.0             | C              | 1.0                      | 8              | 0025                               | 0125    | 0225     | 0325      | 5025             | 2025    | 3025     | 4025      | T252C227K010(1)S |                           |
| 10            | 220.0             | C              | 1.0                      | 8              | 0026                               | 0126    | 0226     | 0326      | 5026             | 2026    | 3026     | 4026      | T252C227M010(1)S |                           |
| 10            | 270.0             | C              | 2.0                      | 8              | 0027                               | 0127    | 0227     | 0327      | 5027             | 2027    | 3027     | 4027      | T252C277K010(1)S |                           |
| 10            | 390.0             | D              | 2.0                      | 10             | 0028                               | 0128    | 0228     | 0328      | 5028             | 2028    | 3028     | 4028      | T252D397K010(1)S |                           |
| 10            | 470.0             | D              | 4.0                      | 10             | 0029                               | 0129    | 0229     | 0329      | 5029             | 2029    | 3029     | 4029      | T252D477K010(1)S |                           |
| 10            | 470.0             | D              | 4.0                      | 10             | 0030                               | 0130    | 0230     | 0330      | 5030             | 2030    | 3030     | 4030      | T252D477M010(1)S |                           |
| 10            | 560.0             | D              | 4.0                      | 10             | 0031                               | 0131    | 0231     | 0331      | 5031             | 2031    | 3031     | 4031      | T252D567K010(1)S |                           |
| 15            | 4.7               | A              | 0.5                      | 4              | 0032                               | 0132    | 0232     | 0332      | 5032             | 2032    | 3032     | 4032      | T252A475K015(1)S |                           |
| 15            | 4.7               | A              | 0.5                      | 4              | 0033                               | 0133    | 0233     | 0333      | 5033             | 2033    | 3033     | 4033      | T252A475M015(1)S |                           |
| 15            | 5.6               | A              | 0.5                      | 4              | 0034                               | 0134    | 0234     | 0334      | 5034             | 2034    | 3034     | 4034      | T252A565K015(1)S |                           |
| 15            | 33.0              | B              | 1.0                      | 6              | 0035                               | 0135    | 0235     | 0335      | 5035             | 2035    | 3035     | 4035      | T252B336K015(1)S |                           |
| 15            | 33.0              | B              | 1.0                      | 6              | 0036                               | 0136    | 0236     | 0336      | 5036             | 2036    | 3036     | 4036      | T252B336M015(1)S |                           |
| 15            | 39.0              | B              | 1.0                      | 6              | 0037                               | 0137    | 0237     | 0337      | 5037             | 2037    | 3037     | 4037      | T252B396K015(1)S |                           |
| 15            | 150.0             | C              | 1.0                      | 8              | 0038                               | 0138    | 0238     | 0338      | 5038             | 2038    | 3038     | 4038      | T252C157K015(1)S |                           |
| 15            | 150.0             | C              | 1.0                      | 8              | 0039                               | 0139    | 0239     | 0339      | 5039             | 2039    | 3039     | 4039      | T252C157M015(1)S |                           |
| 15            | 180.0             | C              | 2.0                      | 8              | 0040                               | 0140    | 0240     | 0340      | 5040             | 2040    | 3040     | 4040      | T252C187K015(1)S |                           |
| 15            | 220.0             | D              | 2.0                      | 8              | 0041                               | 0141    | 0241     | 0341      | 5041             | 2041    | 3041     | 4041      | T252D227K015(1)S |                           |
| 15            | 220.0             | D              | 2.0                      | 8              | 0042                               | 0142    | 0242     | 0342      | 5042             | 2042    | 3042     | 4042      | T252D227M015(1)S |                           |
| 15            | 270.0             | D              | 2.0                      | 8              | 0043                               | 0143    | 0243     | 0343      | 5043             | 2043    | 3043     | 4043      | T252D277K015(1)S |                           |
| 15            | 330.0             | D              | 2.0                      | 8              | 0044                               | 0144    | 0244     | 0344      | 5044             | 2044    | 3044     | 4044      | T252D337K015(1)S |                           |
| 15            | 330.0             | D              | 2.0                      | 8              | 0045                               | 0145    | 0245     | 0345      | 5045             | 2045    | 3045     | 4045      | T252D337M015(1)S |                           |
| 20            | 2.7               | A              | 0.5                      | 4              | 0046                               | 0146    | 0246     | 0346      | 5046             | 2046    | 3046     | 4046      | T252A275K020(1)S |                           |
| 20            | 3.3               | A              | 0.5                      | 4              | 0047                               | 0147    | 0247     | 0347      | 5047             | 2047    | 3047     | 4047      | T252A335K020(1)S |                           |
| 20            | 3.3               | A              | 0.5                      | 4              | 0048                               | 0148    | 0248     | 0348      | 5048             | 2048    | 3048     | 4048      | T252A335M020(1)S |                           |
| VDC           | µF                | Case Size Code | µA at 25°C Max/5 Minutes | 120 Hz Maximum | M (1.0)                            | P (0.1) | R (0.01) | S (0.001) | G (1)            | B (0.1) | C (0.01) | D (0.001) | Part Number      |                           |
| Rated Voltage | Rated Capacitance |                | DC Leakage               | DF % at 25°C   | MIL-PRF-39003 (CSR33) Capacitors   |         |          |           |                  |         |          |           |                  |                           |

(1) To complete KEMET Part Number (T252), insert Graded failure rate - A for Not Applicable, B for 0.1%/k hours, C for 0.01%/k hours, D for 0.001%/k hours or G for 1%/k hours. Designates Reliability Level.

(2) To complete KEMET Part Number (T252), insert Exponential failure rate - M for 1%/k hours, P for .1%/k hours, R for .01%/k hours, or S for .001%/k hours. Designates reliability level.

Table 1 – Ratings &amp; Part Number Reference cont'd

| Rated Voltage | Rated Capacitance | Case Size Code | DC Leakage               | DF % at 25°C   | MIL-PRF-39003 (CSR33) Capacitors   |         |          |           |                  |         |          |           |                  | KEMET Equivalent Military |
|---------------|-------------------|----------------|--------------------------|----------------|------------------------------------|---------|----------|-----------|------------------|---------|----------|-----------|------------------|---------------------------|
|               |                   |                |                          |                | Dash Number Reference              |         |          |           |                  |         |          |           |                  |                           |
|               |                   |                |                          |                | Failure Rate Level (%/1,000 Hours) |         |          |           |                  |         |          |           |                  |                           |
|               |                   |                |                          |                | MIL-PRF-39003/6F                   |         |          |           | MIL-PRF-39003/6F |         |          |           |                  |                           |
|               |                   |                |                          |                | Exponential                        |         |          |           | Graded           |         |          |           |                  |                           |
| VDC           | µF                |                | µA at 25°C Max/5 Minutes | 120 Hz Maximum | M (1.0)                            | P (0.1) | R (0.01) | S (0.001) | G (1)            | B (0.1) | C (0.01) | D (0.001) | Part Number      |                           |
| 20            | 3.9               | A              | 0.5                      | 4              | 0049                               | 0149    | 0249     | 0349      | 5049             | 2049    | 3049     | 4049      | T252A395K020(1)S |                           |
| 20            | 18.0              | B              | 1.0                      | 6              | 0050                               | 0150    | 0250     | 0350      | 5050             | 2050    | 3050     | 4050      | T252B186K020(1)S |                           |
| 20            | 22.0              | B              | 1.0                      | 6              | 0051                               | 0151    | 0251     | 0351      | 5051             | 2051    | 3051     | 4051      | T252B226K020(1)S |                           |
| 20            | 22.0              | B              | 1.0                      | 6              | 0052                               | 0152    | 0252     | 0352      | 5052             | 2052    | 3052     | 4052      | T252B226M020(1)S |                           |
| 20            | 27.0              | B              | 1.0                      | 6              | 0053                               | 0153    | 0253     | 0353      | 5053             | 2053    | 3053     | 4053      | T252B276K020(1)S |                           |
| 20            | 56.0              | C              | 1.0                      | 6              | 0054                               | 0154    | 0254     | 0354      | 5054             | 2054    | 3054     | 4054      | T252C556K020(1)S |                           |
| 20            | 68.0              | C              | 1.0                      | 6              | 0055                               | 0155    | 0255     | 0355      | 5055             | 2055    | 3055     | 4055      | T252C686K020(1)S |                           |
| 20            | 68.0              | C              | 1.0                      | 6              | 0056                               | 0156    | 0256     | 0356      | 5056             | 2056    | 3056     | 4056      | T252C686M020(1)S |                           |
| 20            | 82.0              | C              | 1.0                      | 6              | 0057                               | 0157    | 0257     | 0357      | 5057             | 2057    | 3057     | 4057      | T252C826K020(1)S |                           |
| 20            | 100.0             | C              | 1.0                      | 6              | 0058                               | 0158    | 0258     | 0358      | 5058             | 2058    | 3058     | 4058      | T252C107K020(1)S |                           |
| 20            | 100.0             | C              | 1.0                      | 6              | 0059                               | 0159    | 0259     | 0359      | 5059             | 2059    | 3059     | 4059      | T25C107M020(1)S  |                           |
| 20            | 120.0             | C              | 1.0                      | 6              | 0060                               | 0160    | 0260     | 0360      | 5060             | 2060    | 3060     | 4060      | T252C127K020(1)S |                           |
| 20            | 150.0             | D              | 2.0                      | 8              | 0061                               | 0161    | 0261     | 0361      | 5061             | 2061    | 3061     | 4061      | T252D157K020(1)S |                           |
| 20            | 150.0             | D              | 2.0                      | 8              | 0062                               | 0162    | 0262     | 0362      | 5062             | 2062    | 3062     | 4062      | T252D157M020(1)S |                           |
| 20            | 180.0             | D              | 2.0                      | 8              | 0063                               | 0163    | 0263     | 0363      | 5063             | 2063    | 3063     | 4063      | T252D187K020(1)S |                           |
| 35            | 1.8               | A              | 0.5                      | 4              | 0064                               | 0164    | 0264     | 0364      | 5064             | 2064    | 3064     | 4064      | T252A185K035(1)S |                           |
| 35            | 8.2               | B              | 1.0                      | 6              | 0065                               | 0165    | 0265     | 0365      | 5065             | 2065    | 3065     | 4065      | T252B825K035(1)S |                           |
| 35            | 10.0              | B              | 1.0                      | 6              | 0066                               | 0166    | 0266     | 0366      | 5066             | 2066    | 3066     | 4066      | T252B106K035(1)S |                           |
| 35            | 10.0              | B              | 1.0                      | 6              | 0067                               | 0167    | 0267     | 0367      | 5067             | 2067    | 3067     | 4067      | T252B106M035(1)S |                           |
| 35            | 33.0              | C              | 1.0                      | 6              | 0068                               | 0168    | 0268     | 0368      | 5068             | 2068    | 3068     | 4068      | T252C336K035(1)S |                           |
| 35            | 33.0              | C              | 1.0                      | 6              | 0069                               | 0169    | 0269     | 0369      | 5069             | 2069    | 3069     | 4069      | T252C336M035(1)S |                           |
| 35            | 39.0              | C              | 1.0                      | 6              | 0070                               | 0170    | 0270     | 0370      | 5070             | 2070    | 3070     | 4070      | T252C396K035(1)S |                           |
| 35            | 47.0              | C              | 1.0                      | 6              | 0071                               | 0171    | 0271     | 0371      | 5071             | 2071    | 3071     | 4071      | T252C476K035(1)S |                           |
| 35            | 47.0              | C              | 1.0                      | 6              | 0072                               | 0172    | 0272     | 0372      | 5072             | 2072    | 3072     | 4072      | T252C476M035(1)S |                           |
| 35            | 56.0              | D              | 2.0                      | 6              | 0073                               | 0173    | 0273     | 0373      | 5073             | 2073    | 3073     | 4073      | T252D566K035(1)S |                           |
| 35            | 68.0              | D              | 2.0                      | 6              | 0074                               | 0174    | 0274     | 0374      | 5074             | 2074    | 3074     | 4074      | T252D686K035(1)S |                           |
| 35            | 68.0              | D              | 2.0                      | 6              | 0075                               | 0175    | 0275     | 0375      | 5075             | 2075    | 3075     | 4075      | T252D686M035(1)S |                           |
| 50            | 1.2               | A              | 0.5                      | 4              | 0076                               | 0176    | 0276     | 0376      | 5076             | 2076    | 3076     | 4076      | T252A125K050(1)S |                           |
| 50            | 1.5               | A              | 0.5                      | 4              | 0077                               | 0177    | 0277     | 0377      | 5077             | 2077    | 3077     | 4077      | T252A155K050(1)S |                           |
| 50            | 1.5               | A              | 0.5                      | 4              | 0078                               | 0178    | 0278     | 0378      | 5078             | 2078    | 3078     | 4078      | T252A155M050(1)S |                           |
| 50            | 5.6               | B              | 1.0                      | 4              | 0079                               | 0179    | 0279     | 0379      | 5079             | 2079    | 3079     | 4079      | T252B565K050(1)S |                           |
| 50            | 6.8               | B              | 1.0                      | 6              | 0080                               | 0180    | 0280     | 0380      | 5080             | 2080    | 3080     | 4080      | T252B685K050(1)S |                           |
| 50            | 6.8               | B              | 1.0                      | 6              | 0081                               | 0181    | 0281     | 0381      | 5081             | 2081    | 3081     | 4081      | T252B685M050(1)S |                           |
| 50            | 22.0              | C              | 1.0                      | 6              | 0082                               | 0182    | 0282     | 0382      | 5082             | 2082    | 3082     | 4082      | T252C226K050(1)S |                           |
| 50            | 22.0              | C              | 1.0                      | 6              | 0083                               | 0183    | 0283     | 0383      | 5083             | 2083    | 3083     | 4083      | T252C226M050(1)S |                           |
| 50            | 27.0              | C              | 1.0                      | 6              | 0084                               | 0184    | 0284     | 0384      | 5084             | 2084    | 3084     | 4084      | T252C276K050(1)S |                           |
| 50            | 33.0              | D              | 1.0                      | 6              | 0085                               | 0185    | 0285     | 0385      | 5085             | 2085    | *        | *         | T252D336K050(1)S |                           |
| 50            | 33.0              | D              | 1.0                      | 6              | 0086                               | 0186    | 0286     | 0386      | 5086             | 2086    | *        | *         | T252D336M050(1)S |                           |
| 50            | 39.0              | D              | 1.0                      | 6              | 0087                               | 0187    | 0287     | 0387      | 5087             | 2087    | *        | *         | T252D396K050(1)S |                           |
| VDC           | µF                | Case Size Code | µA at 25°C Max/5 Minutes | 120 Hz Maximum | M (1.0)                            | P (0.1) | R (0.01) | S (0.001) | G (1)            | B (0.1) | C (0.01) | D (0.001) | Part Number      |                           |
| Rated Voltage | Rated Capacitance |                | DC Leakage               | DF % at 25°C   | MIL-PRF-39003 (CSR33) Capacitors   |         |          |           |                  |         |          |           |                  |                           |

(1) To complete KEMET Part Number (T252), insert Graded failure rate - A for Not Applicable, B for 0.1%/k hours, C for 0.01%/k hours, D for 0.001%/k hours or G for 1%/k hours. Designates Reliability Level.

(2) To complete KEMET Part Number (T252), insert Exponential failure rate - M for 1%/k hours, P for .1%/k hours, R for .01%/k hours, or S for .001%/k hours. Designates reliability level.

## Ripple Current/Ripple Voltage

Permissible AC ripple voltage is related to the ESR of the capacitor and the power dissipation capabilities of a particular case size. Thermal capacities for the various case sizes have been determined empirically and are listed below.

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

T = Environmental Temperature

| Case Size | Maximum Power Dissipation (P max) | T2XX  |
|-----------|-----------------------------------|-------|
| A         | 0.09                              | 0.070 |
| B         | 0.100                             | 0.090 |
| C         | 0.125                             | –     |
| D         | 0.180                             | –     |

Permissible AC ripple current can be determined by the following:

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

P max = maximum watts

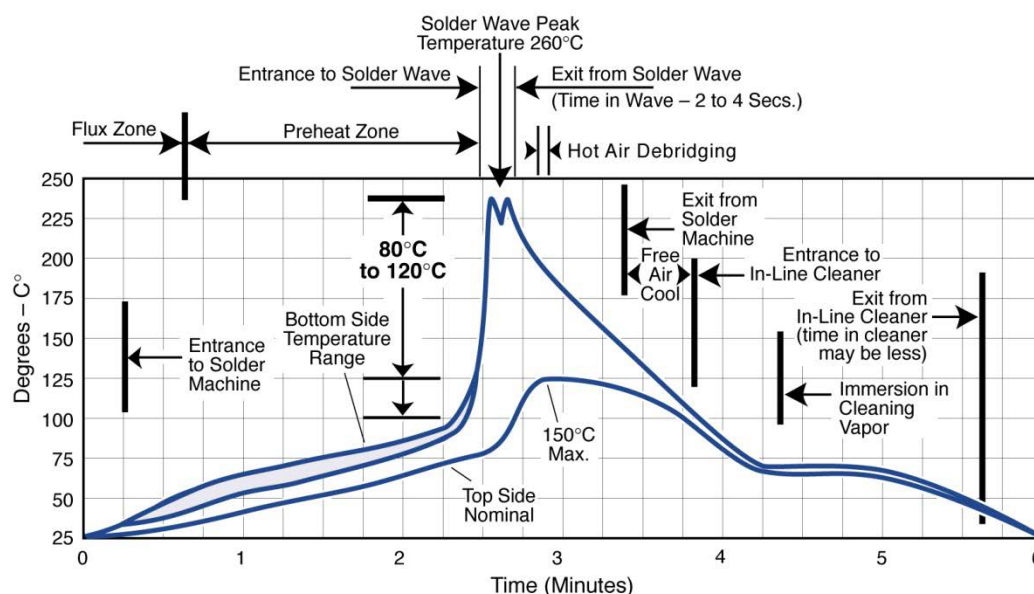
R = ESR at specified frequency (ohms)

I = rms ripple current (amperes)

Z = capacitor impedance in ohms at the specified frequency

Maximum Power Dissipation: 25°C Ambient

## Optimum Solder Wave Profile



## Reverse Voltage

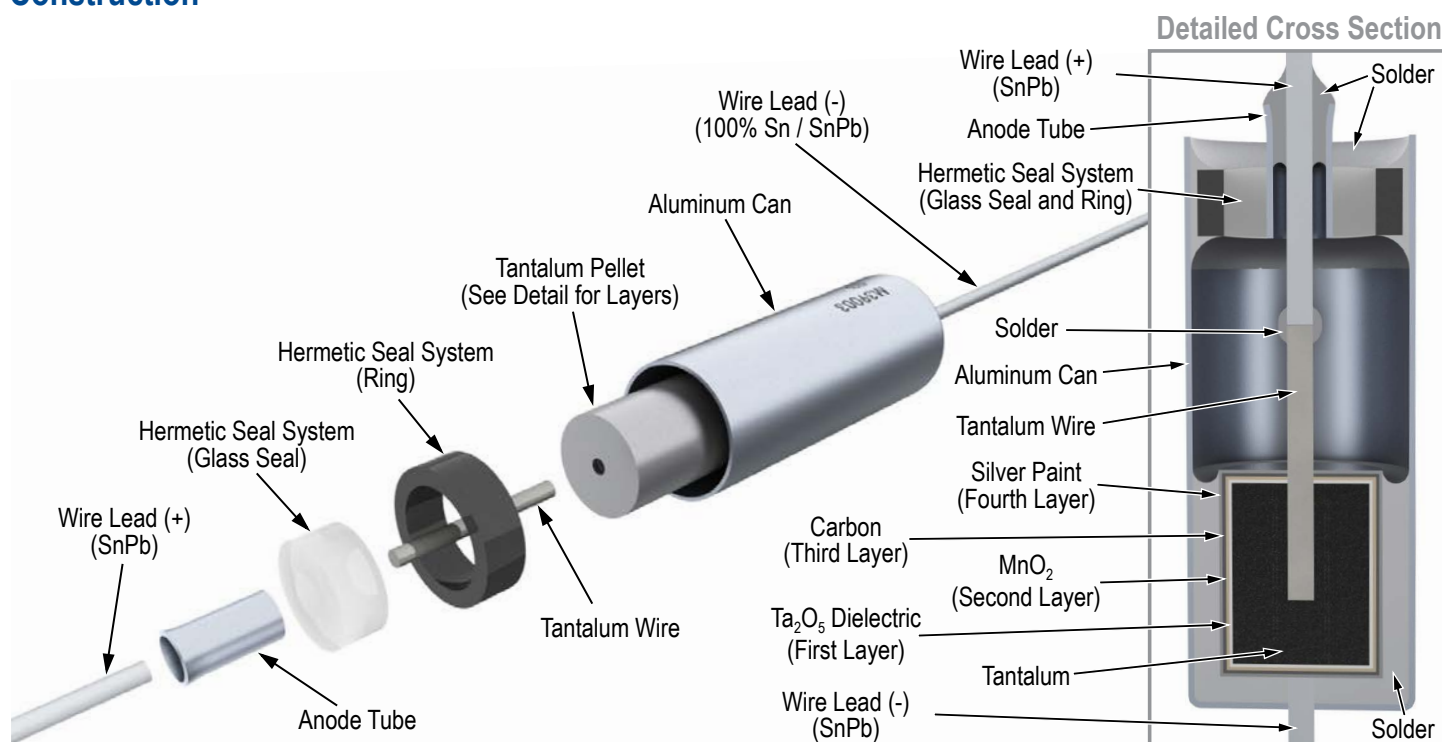
Although these are polar capacitors, some degree of transient voltage reversal is permissible, as seen below. The capacitors should not be operated continuously in reverse mode, even within these limits.

| Temperature | Percentage of Rated Voltage |
|-------------|-----------------------------|
| +25°C       | 15                          |
| +85°C       | 5                           |
| +125°C      | 1                           |

## Mounting

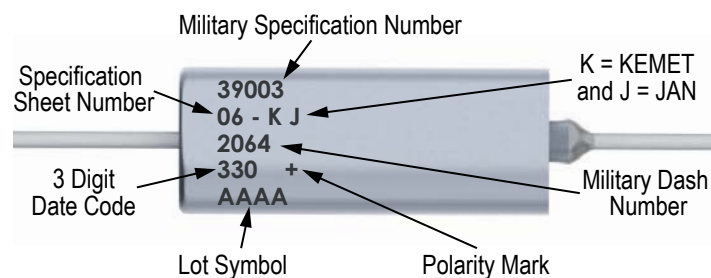
All encased capacitors will pass the Resistance to Soldering Heat Test of MIL-STD-202, Method 210, Condition C. This test simulates wave solder of topside board mount product. This demonstration of resistance to solder heat is in accordance with what is believed to be the industry standard. More severe treatment must be considered reflective of an improper soldering process. The above figure is a recommended solder wave profile for both axial and radial lead solid tantalum capacitors.

## Construction

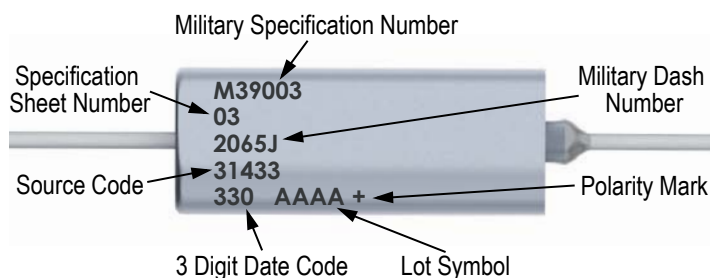


## Capacitor Marking

### A Case

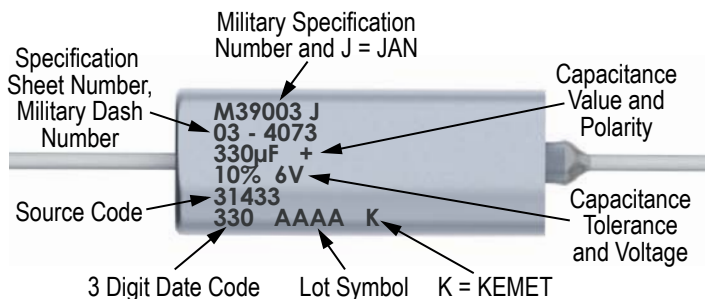


### B Case



| Date Code | 3 Digit                                                                            | 4 Digit   |
|-----------|------------------------------------------------------------------------------------|-----------|
| Year      | 5 = 2015                                                                           | 15 = 2015 |
|           | 6 = 2016                                                                           | 16 = 2016 |
|           | 7 = 2017                                                                           | 17 = 2017 |
|           | 8 = 2018                                                                           | 18 = 2018 |
|           | 9 = 2019                                                                           | 19 = 2019 |
| Week      | 01 = 1 <sup>st</sup> week of the year to<br>52 = 52 <sup>nd</sup> week of the year |           |

### C and D Case

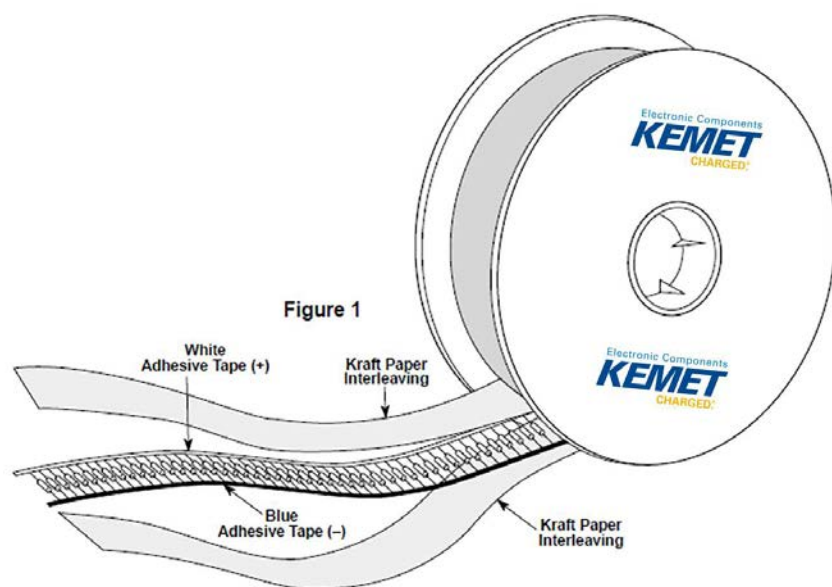


## Storage

Tantalum hermetically sealed capacitors should be stored in normal working environments. While the capacitors 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 capacitors stock should be used promptly, preferably within three years of receipt.

## Tape & Reel Packaging Information

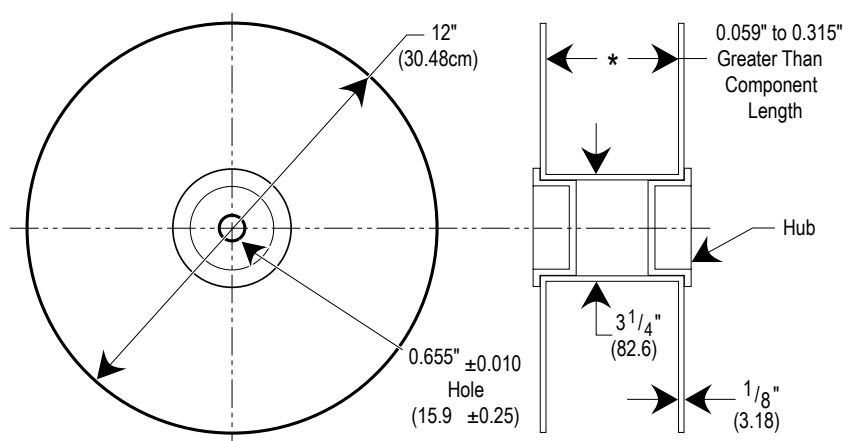
KEMET offers standard reeling of Solid Tantalum Capacitors for automatic insertion or lead forming machines per EIA Specification RS-296E.



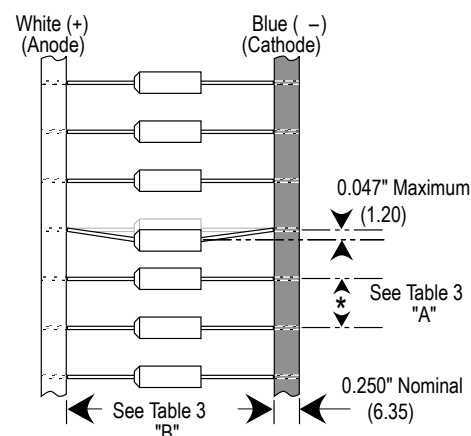
**Table 2 – Packaging Quantity**

| Case Size | Standard Bulk Quantity | Standard Reel Quantity | Reel C-Spec | Ammo Pack Quantity | Ammo Pack C-Spec                |
|-----------|------------------------|------------------------|-------------|--------------------|---------------------------------|
| A         | 150/Box                | 3,500                  | C-7200      | 1,500              | C-7293                          |
| B         | 75/Box                 | 2,500                  | C-7200      | 1,000              | Class I                         |
| C         | 20/Tray                | 500                    | C-7200      | 250                | C-7442                          |
| D         | 20/Tray                | 400                    | C-7200      | 250                | Class II<br>C-7443<br>Class III |

**Figure 2**



**Figure 3**



**Table 3 – Tape Dimensions**

| Component Body Diameter            | Component Pitch "A" | Inside Tape Spacing "B" ±1.5 mm (0.059") |           |         |
|------------------------------------|---------------------|------------------------------------------|-----------|---------|
|                                    |                     | I                                        | II        | III     |
| 0" (0 mm) to 0.197" (5 mm)         | 0.200" or (5 mm)    | 2.062"                                   | 2.500"    | 2.874"  |
| 0.197" (5.01 mm) to 0.394" (10 mm) | 0.400 or (10 mm)    | (52.4 mm)                                | (63.5 mm) | (73 mm) |

Capacitors are reeled so that positive leads are oriented as shown in Figure 3. Kraft paper (50lb. test minimum) is inserted between the layers of capacitors wound on reels for component pitch  $\leq 0.200$ " sizes and corrugated paper (70 lb. test minimum), single faced is inserted for component pitch  $\geq 0.400$ " sizes. Capacitor lead length may extend only a maximum of .031" (0.8 mm) beyond the tape's edges. Capacitors are centered in a row between the two tapes and will deviate only  $\pm 0.031$ " (0.79 mm) from the row center. Figures 1 and 2 show the KEMET standard chipboard tape reel. A minimum of 36" (91.5 cm) leader tape is provided at each end of the reeled capacitors. Universal splicing clips are used to connect the tape.

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