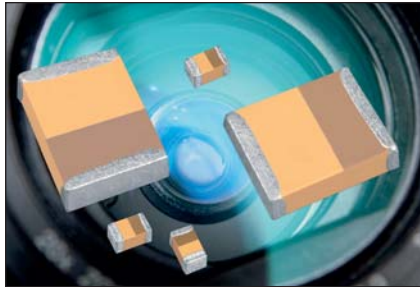


# TLC Series



## Tantalum Solid Electrolytic Chip Capacitors Consumer Series



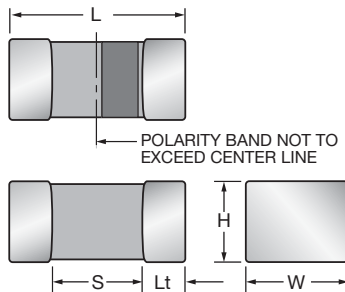
### FEATURES

- High capacitance vs. voltage ratio
- Super high volumetric efficiency
- CV range: 0.47-220 $\mu$ F / 2-35V
- 12 case sizes available
- Consumer applications (portable handheld electronics, cellular phones, digital equipments etc.)



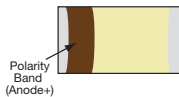
### APPLICATIONS

- Consumer portable applications with space limitations

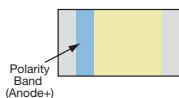


### MARKING

A, D, H, J, K, L, M, R, T,  
U, V, Z CASE



### E CASE



### CASE DIMENSIONS: millimeters (inches)

| Code | EIA Code | EIA Metric | L+0.20 (0.008)<br>-0.00 (0.000)        | W+0.15 (0.006)<br>-0.00 (0.000)            | H+0.15 (0.006)<br>-0.00 (0.000)            | Termination Spacing(S) | Minimum Termination Length (Lt) |
|------|----------|------------|----------------------------------------|--------------------------------------------|--------------------------------------------|------------------------|---------------------------------|
| A    | 1206     | 3216-18    | 3.20 $\pm$ 0.20<br>(0.126 $\pm$ 0.008) | 1.60 $\pm$ 0.20<br>(0.063 $\pm$ 0.008)     | 1.60 $\pm$ 0.20<br>(0.063 $\pm$ 0.008)     | 1.80 (0.071) min       | 0.15 (0.006)                    |
| D    | 1206     | 3216-06    | 3.20 $\pm$ 0.20<br>(0.126 $\pm$ 0.008) | 1.60 $\pm$ 0.20<br>(0.063 $\pm$ 0.008)     | 0.60 (0.024) max                           | 1.80 (0.071) min       | 0.15 (0.006)                    |
| E    | 0201     | 0603-03    | 0.60 $\pm$ 0.12<br>(0.024 $\pm$ 0.005) | 0.33 $\pm$ 0.02<br>(0.013 $\pm$ 0.001)     | 0.33 $\pm$ 0.02<br>(0.013 $\pm$ 0.001)     | 0.20 (0.008) min       | 0.10 (0.004)                    |
| H    | 0805     | 2012-10    | 2.00 (0.079)                           | 1.35 (0.053)                               | 1.00 (0.039) max                           | 0.70 (0.028) min       | 0.15 (0.006)                    |
| J    | 0603     | 1608-08    | 1.60 (0.063)                           | 0.85 (0.033)                               | 0.75 (0.030) max                           | 0.55 (0.022) min       | 0.15 (0.006)                    |
| K    | 0402     | 1005-07    | 1.00 (0.039)                           | 0.50 $\pm$ 0.20<br>-0.00<br>(0.020 -0.000) | 0.50 $\pm$ 0.20<br>-0.00<br>(0.020 -0.000) | 0.40 (0.016) min       | 0.10 (0.004)                    |
| L    | 0603     | 1608-10    | 1.60 (0.063)                           | 0.85 (0.033)                               | 0.85 (0.033)                               | 0.55 (0.022) min       | 0.15 (0.006)                    |
| M    | 0803     | 2008-10    | 2.00 (0.079)                           | 0.85 (0.033)                               | 0.85 (0.033)                               | 0.70 (0.028) min       | 0.15 (0.006)                    |
| R    | 0805     | 2012-15    | 2.00 (0.079)                           | 1.35 (0.053)                               | 1.35 (0.053)                               | 0.70 (0.028) min       | 0.15 (0.006)                    |
| T    | 1210     | 3528-12    | 3.50 $\pm$ 0.20<br>(0.138 $\pm$ 0.008) | 2.80 $\pm$ 0.20<br>-0.10<br>(0.110 -0.004) | 1.20 (0.047) max                           | 2.00 (0.079) min       | 0.15 (0.006)                    |
| U    | 0805     | 2012-06    | 2.00 (0.079)                           | 1.35 (0.053)                               | 0.60 (0.024) max                           | 0.70 (0.028) min       | 0.15 (0.006)                    |
| V    | 1206     | 3216-08    | 3.20 $\pm$ 0.20<br>(0.126 $\pm$ 0.008) | 1.60 $\pm$ 0.20<br>(0.063 $\pm$ 0.008)     | 0.75 (0.030) max                           | 1.80 (0.071) min       | 0.15 (0.006)                    |
| Z    | 0602     | 1605-07    | 1.60 (0.063)                           | 0.50 $\pm$ 0.20<br>-0.00<br>(0.020 -0.000) | 0.50 $\pm$ 0.20<br>-0.00<br>(0.020 -0.000) | 0.55 (0.022) min       | 0.15 (0.006)                    |

Under development

### HOW TO ORDER

**TLC**

Type

**L**

Case Size  
See table above

**226**

Capacitance Code  
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

**M**

Tolerance  
M=±20%

**006**

Rated DC Voltage  
002=2Vdc  
003=3Vdc  
004=4Vdc  
006=6.3Vdc  
008=8Vdc  
010=10Vdc  
016=16Vdc  
020=20Vdc  
025=25Vdc  
035=35Vdc

**R**

Packaging  
R, P = 7" Standard Tin Termination Plastic Tape  
X, Q = 4 1/4" Standard Tin Termination Plastic Tape  
A, M = 7" Gold Termination Plastic Tape  
F, N = 4 1/4" Gold Termination Plastic Tape  
H = Chip Tray (waffle)

**TA**

Standard Suffix  
OR  
**4000**  
ESR in m $\Omega$

## Tantalum Solid Electrolytic Chip Capacitors Consumer Series

### TECHNICAL SPECIFICATIONS

|                            |                                                                                                         |     |     |     |     |     |    |     |    |      |      |  |
|----------------------------|---------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|----|-----|----|------|------|--|
| Technical Data:            | All technical data relate to an ambient temperature of +25°C                                            |     |     |     |     |     |    |     |    |      |      |  |
| Capacitance Range:         | 0.47 $\mu$ F to 220 $\mu$ F                                                                             |     |     |     |     |     |    |     |    |      |      |  |
| Capacitance Tolerance:     | $\pm 20\%$                                                                                              |     |     |     |     |     |    |     |    |      |      |  |
| Rated Voltage ( $V_R$ )    | -55°C $\leq$ +40°C:                                                                                     | 2   | 3   | 4   | 6.3 | 8   | 10 | 16  | 20 | 25   | 35   |  |
| Category Voltage ( $V_C$ ) | at 85°C:                                                                                                | 1   | 1.5 | 2   | 3.2 | 4   | 5  | 8   | 10 | 12.5 | 17.5 |  |
| Category Voltage ( $V_C$ ) | at 125°C:                                                                                               | 0.4 | 0.6 | 0.8 | 1.3 | 1.6 | 2  | 3.2 | 4  | 5    | 7    |  |
| Temperature Range:         | -55°C to +125°C with category voltage                                                                   |     |     |     |     |     |    |     |    |      |      |  |
| Reliability:               | 0.2% per 1000 hours at 85°C, 0.5x $V_R$ with 0.1 $\Omega$ /V series impedance with 60% confidence level |     |     |     |     |     |    |     |    |      |      |  |

### CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

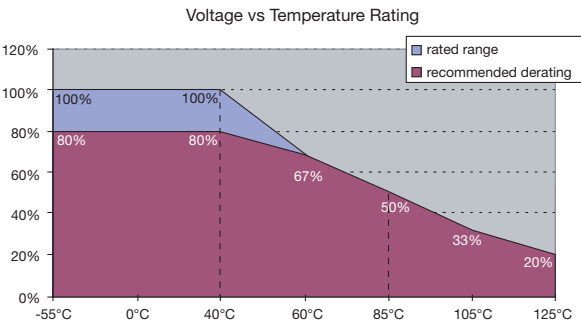
| Capacitance |      | Voltage Rating DC ( $V_R$ ) to 40°C |      |       |                 |    |      |     |     |     |     |
|-------------|------|-------------------------------------|------|-------|-----------------|----|------|-----|-----|-----|-----|
| $\mu$ F     | Code | 2.0V                                | 3.0V | 4.0V  | 6.3V            | 8V | 10V  | 16V | 20V | 25V | 35V |
| 0.47        | 474  |                                     |      |       | E               |    |      | K   |     |     |     |
| 1.0         | 105  |                                     |      |       | E               |    |      | K   |     | L   | R   |
| 2.2         | 225  |                                     |      |       |                 |    | K    |     | H   | R   |     |
| 3.3         | 335  |                                     |      |       |                 |    |      | L   |     |     |     |
| 4.7         | 475  |                                     |      | K     | K/U             |    | J    |     |     |     |     |
| 6.8         | 685  |                                     | K    | K     |                 |    | U    |     |     |     |     |
| 10          | 106  |                                     | K    | J/K/Z | J/K/Z           |    | U    | V   | R   |     |     |
| 15          | 156  | K                                   | K*   | K     |                 |    | H/L  |     |     |     |     |
| 22          | 226  | J                                   | J    | K*/U  | L/U             |    | L/M  |     |     |     |     |
| 33          | 336  |                                     |      | L/U   | H/L/L(4000)/U/V | L  | H    |     |     |     |     |
| 47          | 476  | L                                   | L/R  | H/L   | H/L/R/V         | D  | H/R  |     |     |     |     |
| 68          | 686  |                                     |      | R     | R               |    | R*   |     |     |     |     |
| 100         | 107  |                                     |      | I*/R  | D*/I*/R/T       |    | R*/T |     |     |     |     |
| 150         | 157  |                                     |      | R*    | R*              |    | A*   |     |     |     |     |
| 220         | 227  | R*                                  |      | R*/T  |                 |    |      |     |     |     |     |

Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

\*Codes under development - subject to change.

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.



# TLC Series



## Tantalum Solid Electrolytic Chip Capacitors Consumer Series

### RATINGS & PART NUMBER REFERENCE

| AVX<br>Part No.  | Case<br>Size | Capacitance<br>(µF) | Rated<br>Voltage<br>(V) | Rated<br>Temperature<br>(°C) | Category<br>Voltage<br>(V) | Category<br>Temperature<br>(°C) | DCL<br>Max.<br>(µA) | ESR<br>Max.<br>@ 100kHz<br>(Ω) | MSL | 100kHz RMS Current (mA) |      |       |  |
|------------------|--------------|---------------------|-------------------------|------------------------------|----------------------------|---------------------------------|---------------------|--------------------------------|-----|-------------------------|------|-------|--|
|                  |              |                     |                         |                              |                            |                                 |                     |                                |     | 25°C                    | 85°C | 125°C |  |
| 2 Volt @ 40°C    |              |                     |                         |                              |                            |                                 |                     |                                |     |                         |      |       |  |
| TLCK156M002#TA   | K            | 15                  | 2                       | 40                           | 0.4                        | 125                             | 0.5                 | 15                             | 3   | 32                      | 28   | 13    |  |
| TLCJ226M002#TA   | J            | 22                  | 2                       | 40                           | 0.4                        | 125                             | 0.5                 | 7.5                            | 3   | 52                      | 46   | 21    |  |
| TLCL476M002#TA   | L            | 47                  | 2                       | 40                           | 0.4                        | 125                             | 0.9                 | 7.5                            | 3   | 58                      | 52   | 23    |  |
| 3 Volt @ 40°C    |              |                     |                         |                              |                            |                                 |                     |                                |     |                         |      |       |  |
| TLCK685M003#TA   | K            | 6.8                 | 3                       | 40                           | 0.6                        | 125                             | 0.5                 | 15                             | 3   | 32                      | 28   | 13    |  |
| TLCK106M003#TA   | K            | 10                  | 3                       | 40                           | 0.6                        | 125                             | 0.5                 | 15                             | 3   | 32                      | 28   | 13    |  |
| TLCJ226M003#TA   | J            | 22                  | 3                       | 40                           | 0.6                        | 125                             | 0.7                 | 7.5                            | 3   | 52                      | 46   | 21    |  |
| TLCL476M003#TA   | L            | 47                  | 3                       | 40                           | 0.6                        | 125                             | 1.4                 | 7.5                            | 3   | 58                      | 52   | 23    |  |
| TLCR476M003#TA   | R            | 47                  | 3                       | 40                           | 0.6                        | 125                             | 3.0                 | 7.5                            | 3   | 77                      | 70   | 31    |  |
| 4 Volt @ 40°C    |              |                     |                         |                              |                            |                                 |                     |                                |     |                         |      |       |  |
| TLCK475M004#TA   | K            | 4.7                 | 4                       | 40                           | 0.8                        | 125                             | 0.5                 | 15                             | 3   | 32                      | 28   | 13    |  |
| TLCK685M004#TA   | K            | 6.8                 | 4                       | 40                           | 0.8                        | 125                             | 0.5                 | 15                             | 3   | 32                      | 28   | 13    |  |
| TLCJ106M004#TA   | J            | 10                  | 4                       | 40                           | 0.8                        | 125                             | 0.5                 | 7.5                            | 3   | 52                      | 46   | 21    |  |
| TLCK106M004#TA   | K            | 10                  | 4                       | 40                           | 0.8                        | 125                             | 0.5                 | 15                             | 3   | 32                      | 28   | 13    |  |
| TLCZ106M004#TA   | Z            | 10                  | 4                       | 40                           | 0.8                        | 125                             | 0.5                 | 15                             | 3   | 37                      | 33   | 15    |  |
| TLCK156M004#TA   | K            | 15                  | 4                       | 40                           | 0.8                        | 125                             | 3.0                 | 15                             | 3   | 32                      | 28   | 13    |  |
| TLCU226M004#TA   | U            | 22                  | 4                       | 40                           | 0.8                        | 125                             | 0.9                 | 12                             | 3   | 54                      | 49   | 22    |  |
| TLCL336M004#TA   | L            | 33                  | 4                       | 40                           | 0.8                        | 125                             | 1.3                 | 7.5                            | 3   | 58                      | 52   | 23    |  |
| TLCU336M004#TA   | U            | 33                  | 4                       | 40                           | 0.8                        | 125                             | 2.6                 | 9                              | 3   | 62                      | 56   | 25    |  |
| TLCH476M004#TA   | H            | 47                  | 4                       | 40                           | 0.8                        | 125                             | 1.9                 | 5                              | 3   | 89                      | 80   | 36    |  |
| TLCL476M004#TA   | L            | 47                  | 4                       | 40                           | 0.8                        | 125                             | 1.9                 | 7.5                            | 3   | 58                      | 52   | 23    |  |
| TLCR686M004#TA   | R            | 68                  | 4                       | 40                           | 0.8                        | 125                             | 2.7                 | 5                              | 3   | 95                      | 85   | 38    |  |
| TLCR107M004#TA   | R            | 100                 | 4                       | 40                           | 0.8                        | 125                             | 4.0                 | 5                              | 3   | 95                      | 85   | 38    |  |
| TLCT227M004#TA   | T            | 220                 | 4                       | 40                           | 0.8                        | 125                             | 8.8                 | 1                              | 3   | 200                     | 180  | 80    |  |
| 6.3 Volt @ 40°C  |              |                     |                         |                              |                            |                                 |                     |                                |     |                         |      |       |  |
| TLCE474M006HTA   | E            | 0.47                | 6.3                     | 40                           | 1.3                        | 125                             | 1.0                 | 60                             | 3   | 13                      | 12   | 5     |  |
| TLCE105M006HTA   | E            | 1                   | 6.3                     | 40                           | 1.3                        | 125                             | 1.0                 | 60                             | 3   | 13                      | 12   | 5     |  |
| TLCK475M006#TA   | K            | 4.7                 | 6.3                     | 40                           | 1.3                        | 125                             | 0.5                 | 15                             | 3   | 32                      | 28   | 13    |  |
| TLCU475M006#TA   | U            | 4.7                 | 6.3                     | 40                           | 1.3                        | 125                             | 0.5                 | 5                              | 3   | 84                      | 75   | 33    |  |
| TLCK106M006#TA   | J            | 10                  | 6.3                     | 40                           | 1.3                        | 125                             | 0.6                 | 7.5                            | 3   | 52                      | 46   | 21    |  |
| TLCK106M006#TA   | K            | 10                  | 6.3                     | 40                           | 1.3                        | 125                             | 3.1                 | 15                             | 3   | 32                      | 28   | 13    |  |
| TLCZ106M006#TA   | Z            | 10                  | 6.3                     | 40                           | 1.3                        | 125                             | 0.6                 | 15                             | 3   | 37                      | 33   | 15    |  |
| TLCL226M006#TA   | L            | 22                  | 6.3                     | 40                           | 1.3                        | 125                             | 1.4                 | 7.5                            | 3   | 58                      | 52   | 23    |  |
| TLCU226M006#TA   | U            | 22                  | 6.3                     | 40                           | 1.3                        | 125                             | 2.8                 | 12                             | 3   | 54                      | 49   | 22    |  |
| TLCH336M006#TA   | H            | 33                  | 6.3                     | 40                           | 1.3                        | 125                             | 2.0                 | 5                              | 3   | 89                      | 80   | 36    |  |
| TLCL336M006#TA   | L            | 33                  | 6.3                     | 40                           | 1.3                        | 125                             | 2.1                 | 7.5                            | 3   | 58                      | 52   | 23    |  |
| TLCL336M006#4000 | L            | 33                  | 6.3                     | 40                           | 1.3                        | 125                             | 2.1                 | 4                              | 3   | 79                      | 71   | 32    |  |
| TLCU336M006#TA   | U            | 33                  | 6.3                     | 40                           | 1.3                        | 125                             | 10.4                | 7.5                            | 3   | 68                      | 61   | 27    |  |
| TLCV336M006#TA   | V            | 33                  | 6.3                     | 40                           | 1.3                        | 125                             | 4.2                 | 5                              | 3   | 84                      | 75   | 33    |  |
| TLCH476M006#TA   | H            | 47                  | 6.3                     | 40                           | 1.3                        | 125                             | 3.0                 | 5                              | 3   | 89                      | 80   | 36    |  |
| TLCL476M006#TA   | L            | 47                  | 6.3                     | 40                           | 1.3                        | 125                             | 29.6                | 10                             | 3   | 50                      | 45   | 20    |  |
| TLCR476M006#TA   | R            | 47                  | 6.3                     | 40                           | 1.3                        | 125                             | 6.0                 | 5                              | 3   | 95                      | 85   | 38    |  |
| TLCV476M006#TA   | V            | 47                  | 6.3                     | 40                           | 1.3                        | 125                             | 6.0                 | 15                             | 3   | 48                      | 43   | 19    |  |
| TLCR686M006#TA   | R            | 68                  | 6.3                     | 40                           | 1.3                        | 125                             | 4.3                 | 5                              | 3   | 95                      | 85   | 38    |  |
| TLCR107M006#TA   | R            | 100                 | 6.3                     | 40                           | 1.3                        | 125                             | 6.0                 | 5                              | 3   | 95                      | 85   | 38    |  |
| TLCT107M006#TA   | T            | 100                 | 6.3                     | 40                           | 1.3                        | 125                             | 31.5                | 15                             | 3   | 52                      | 46   | 21    |  |
| 8 Volt @ 40°C    |              |                     |                         |                              |                            |                                 |                     |                                |     |                         |      |       |  |
| TLCL336M008#TA   | L            | 33                  | 8                       | 40                           | 1.6                        | 125                             | 26.4                | 10                             | 3   | 50                      | 45   | 20    |  |
| TLCD476M008#TA   | D            | 47                  | 8                       | 40                           | 1.6                        | 125                             | 18.8                | 7                              | 3   | 71                      | 64   | 28    |  |
| 10 Volt @ 40°C   |              |                     |                         |                              |                            |                                 |                     |                                |     |                         |      |       |  |
| TLCK225M010#TA   | K            | 2.2                 | 10                      | 40                           | 2                          | 125                             | 0.5                 | 15                             | 3   | 32                      | 28   | 13    |  |
| TLCJ475M010#TA   | J            | 4.7                 | 10                      | 40                           | 2                          | 125                             | 0.5                 | 10                             | 3   | 45                      | 40   | 18    |  |
| TLCK685M010#TA   | U            | 6.8                 | 10                      | 40                           | 2                          | 125                             | 0.7                 | 5                              | 3   | 84                      | 75   | 33    |  |
| TLCU106M010#TA   | U            | 10                  | 10                      | 40                           | 2                          | 125                             | 1.0                 | 5                              | 3   | 84                      | 75   | 33    |  |
| TLCH156M010#TA   | H            | 15                  | 10                      | 40                           | 2                          | 125                             | 1.5                 | 5                              | 3   | 58                      | 52   | 23    |  |
| TLCL156M010#TA   | L            | 15                  | 10                      | 40                           | 2                          | 125                             | 1.5                 | 7.5                            | 3   | 89                      | 80   | 36    |  |
| TLCL226M010#TA   | L            | 22                  | 10                      | 40                           | 2                          | 125                             | 11                  | 10                             | 3   | 50                      | 45   | 20    |  |
| TLCM226M010#TA   | M            | 22                  | 10                      | 40                           | 2                          | 125                             | 2.2                 | 7.5                            | 3   | 63                      | 57   | 25    |  |
| TLCH336M010#TA   | H            | 33                  | 10                      | 40                           | 2                          | 125                             | 3.3                 | 5                              | 3   | 89                      | 80   | 36    |  |
| TLCH476M010#TA   | H            | 47                  | 10                      | 40                           | 2                          | 125                             | 23.5                | 7.5                            | 3   | 73                      | 66   | 29    |  |
| TLCR476M010#TA   | R            | 47                  | 10                      | 40                           | 2                          | 125                             | 4.7                 | 5                              | 3   | 95                      | 85   | 38    |  |
| TLCT107M010#TA   | T            | 100                 | 10                      | 40                           | 2                          | 125                             | 10                  | 1                              | 3   | 200                     | 180  | 80    |  |
| 16 Volt @ 40°C   |              |                     |                         |                              |                            |                                 |                     |                                |     |                         |      |       |  |
| TLCK474M016#TA   | K            | 0.47                | 16                      | 40                           | 3.2                        | 125                             | 0.5                 | 15                             | 3   | 32                      | 28   | 13    |  |
| TLCK105M016#TA   | K            | 1                   | 16                      | 40                           | 3.2                        | 125                             | 0.8                 | 15                             | 3   | 32                      | 28   | 13    |  |
| TLCL335M016#TA   | L            | 3.3                 | 16                      | 40                           | 3.2                        | 125                             | 0.5                 | 7.5                            | 3   | 58                      | 52   | 23    |  |
| TLCV106M016#TA   | V            | 10                  | 16                      | 40                           | 3.2                        | 125                             | 1.6                 | 2                              | 3   | 132                     | 119  | 53    |  |

# TLC Series



## Tantalum Solid Electrolytic Chip Capacitors Consumer Series

### RATINGS & PART NUMBER REFERENCE

| AVX<br>Part No. | Case<br>Size | Capacitance<br>( $\mu$ F) | Rated<br>Voltage<br>(V) | Rated<br>Temperature<br>(°C) | Category<br>Voltage<br>(V) | Category<br>Temperature<br>(°C) | DCL<br>Max.<br>( $\mu$ A) | ESR<br>Max.<br>@ 100kHz<br>( $\Omega$ ) | MSL | 100kHz RMS Current (mA) |      |       |
|-----------------|--------------|---------------------------|-------------------------|------------------------------|----------------------------|---------------------------------|---------------------------|-----------------------------------------|-----|-------------------------|------|-------|
|                 |              |                           |                         |                              |                            |                                 |                           |                                         |     | 25°C                    | 85°C | 125°C |
| 20 Volt @ 40°C  |              |                           |                         |                              |                            |                                 |                           |                                         |     |                         |      |       |
| TLCH225M020#TA  | H            | 2.2                       | 20                      | 40                           | 4                          | 125                             | 0.5                       | 7.5                                     | 3   | 89                      | 80   | 36    |
| TLCR106M020#TA  | R            | 10                        | 20                      | 40                           | 4                          | 125                             | 0.6                       | 5                                       | 3   | 95                      | 85   | 38    |
| 25 Volt @ 40°C  |              |                           |                         |                              |                            |                                 |                           |                                         |     |                         |      |       |
| TLCL105M025#TA  | L            | 1.0                       | 25                      | 40                           | 5                          | 125                             | 0.5                       | 7.5                                     | 3   | 58                      | 85   | 23    |
| TLCR225M025#TA  | R            | 2.2                       | 25                      | 40                           | 5                          | 125                             | 0.6                       | 5                                       | 3   | 95                      | 85   | 38    |
| 35 Volt @ 40°C  |              |                           |                         |                              |                            |                                 |                           |                                         |     |                         |      |       |
| TLCR105M035#TA  | R            | 1.0                       | 35                      | 40                           | 7                          | 125                             | 0.5                       | 5                                       | 3   | 95                      | 85   | 38    |

Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts.

DCL is measured at rated voltage after 5 minutes.

DCL allowed to move up to 2.00 times the limit post mounting.

For typical weight and composition see page 223.

**NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.**

### QUALIFICATION TABLE

| TEST                  | TLC series (Temperature range -55°C to +125°C)                                                                                                                                                                                                                                                |               |                |                       |                    |                              |       |         |            |            |            |            |            |            |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|-----------------------|--------------------|------------------------------|-------|---------|------------|------------|------------|------------|------------|------------|
|                       | Condition                                                                                                                                                                                                                                                                                     |               |                |                       | Characteristics    |                              |       |         |            |            |            |            |            |            |
| Endurance             | Determine after application of rated voltage for 2000 +48/-0 hours at 40±2°C and then leaving 1-2 hours at room temperature. Also determine of 85°C temperature, category voltage for 2000 +48/-0 hours and then leaving 1-2 hours at room temperature. Power supply impedance to be ≤0.1Ω/V. |               |                |                       | Visual examination | no visible damage            |       |         |            |            |            |            |            |            |
|                       |                                                                                                                                                                                                                                                                                               |               |                |                       | DCL                | 1.25 x initial limit         |       |         |            |            |            |            |            |            |
|                       |                                                                                                                                                                                                                                                                                               |               |                |                       | ΔC/C               | within ±30% of initial value |       |         |            |            |            |            |            |            |
|                       |                                                                                                                                                                                                                                                                                               |               |                |                       | ESR                | 1.5 x initial limit          |       |         |            |            |            |            |            |            |
| Humidity              | Determine after storage without applied voltage at 40±2°C and 90-95% relative humidity for 56 days and then recovery 1-2 hours at room temperature.                                                                                                                                           |               |                |                       | Visual examination | no visible damage            |       |         |            |            |            |            |            |            |
|                       |                                                                                                                                                                                                                                                                                               |               |                |                       | DCL                | 2 x initial limit            |       |         |            |            |            |            |            |            |
|                       |                                                                                                                                                                                                                                                                                               |               |                |                       | ΔC/C               | ±30% of initial value        |       |         |            |            |            |            |            |            |
|                       |                                                                                                                                                                                                                                                                                               |               |                |                       | ESR                | 1.25 x initial limit         |       |         |            |            |            |            |            |            |
| Temperature Stability | Step                                                                                                                                                                                                                                                                                          | Temperature°C | Duration (min) | Voltage Applied       |                    |                              |       |         |            |            |            |            |            |            |
|                       | 1                                                                                                                                                                                                                                                                                             | +20±2         | 15             | N/A                   | DCL                | +20°C                        | -55°C | +20°C   | +40°C      | +60°C      | +85°C      | +125°C     | +20°C      |            |
|                       | 2                                                                                                                                                                                                                                                                                             | -55+0/-3      | 15             | N/A                   |                    | IL*                          | n/a   | IL*     | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* | IL*        |            |
|                       | 3                                                                                                                                                                                                                                                                                             | +20±2         | 15             | N/A                   |                    | ΔC/C                         | n/a   | +0/-25% | ±5%        | +10/-0%    | +10/-0%    | +20/-0%    | +25/-0%    | +20/-10%   |
|                       | 4                                                                                                                                                                                                                                                                                             | +40+2/-0      | 15             | V <sub>R</sub>        |                    |                              | ESR   | IL*     | n/a        | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* |
|                       | 5                                                                                                                                                                                                                                                                                             | +60+2/-0      | 15             | 0.66 x V <sub>R</sub> |                    |                              |       |         |            |            |            |            |            |            |
|                       | 6                                                                                                                                                                                                                                                                                             | +85+3/-0      | 15             | 0.50 x V <sub>R</sub> |                    |                              |       |         |            |            |            |            |            |            |
|                       | 7                                                                                                                                                                                                                                                                                             | +125+3/-0     | 15             | 0.20 x V <sub>R</sub> |                    |                              |       |         |            |            |            |            |            |            |
|                       | 8                                                                                                                                                                                                                                                                                             | +20±2         | 15             | N/A                   |                    |                              |       |         |            |            |            |            |            |            |
| Surge Voltage         | Test temperature: 40°C+3/0°C<br>Test voltage: 1.3 x rated voltage<br>Series protection resistance 1000±100Ω<br>Discharge resistance: 1000Ω<br>Number of cycles: 1000x<br>Cycle duration: 6 min; 30 sec charge,<br>5 min 30 sec discharge                                                      |               |                |                       | Visual examination | no visible damage            |       |         |            |            |            |            |            |            |
|                       |                                                                                                                                                                                                                                                                                               |               |                |                       | DCL                | 2 x initial limit            |       |         |            |            |            |            |            |            |
|                       |                                                                                                                                                                                                                                                                                               |               |                |                       | ΔC/C               | within ±30% of initial value |       |         |            |            |            |            |            |            |
|                       |                                                                                                                                                                                                                                                                                               |               |                |                       | ESR                | 1.25 x initial limit         |       |         |            |            |            |            |            |            |

\*Initial Limit