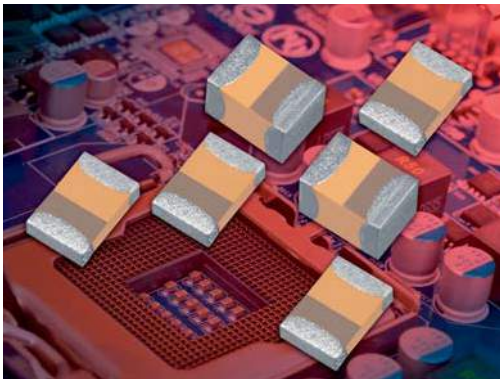


# TPC Series



## Low ESR TACmicrochip®



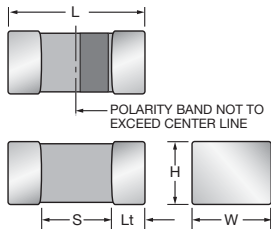
### FEATURES

- Low ESR TACmicrochip® capacitor
- Smallest and low profile tantalum
- CV range: 1.0-100µF / 3-25V
- 4 case sizes available
- Power supply applications



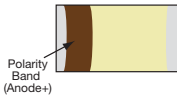
### APPLICATIONS

- Portable controller with elevated power requirements



### MARKING

#### H, K, L, R CASE



### CASE DIMENSIONS: millimeters (inches)

| Code | EIA Code | EIA Metric | L+0.20 (0.008)<br>-0.00 (0.000) | W+0.15 (0.008)<br>-0.00 (0.000)                            | H+0.15 (0.008)<br>-0.00 (0.000)                            | Termination Spacing(S) | Minimum Termination Length (Lt) |
|------|----------|------------|---------------------------------|--|--|------------------------|---------------------------------|
| 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)                    |
| K    | 0402     | 1005-07    | 1.00 (0.039)                    | 0.50 <sup>+0.20</sup><br>-0.00<br>(0.020 +0.008<br>-0.000) | 0.50 <sup>+0.20</sup><br>-0.00<br>(0.020 +0.008<br>-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)                    |
| 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)                    |

### HOW TO ORDER

|                              |                                     |   |                                      |   |  |                  |
|------------------------------|-------------------------------------|---|--------------------------------------|---|--|------------------|
| <b>TPC</b>                   | <b>R</b>                            | <b>106</b>  | <b>*</b>                             | <b>010</b>  | <b>R</b>   | <b>1800</b>      |
| <b>Type</b><br>TACmicrochip® | <b>Case Size</b><br>See table above | <b>Capacitance Code</b><br>pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow) | <b>Tolerance</b><br>K=±10%<br>M=±20% | <b>Rated DC Voltage</b><br>003=3Vdc<br>004=4Vdc<br>006=6.3Vdc<br>010=10Vdc<br>016=16Vdc<br>020=20Vdc<br>025=25Vdc | <b>Packaging</b><br>R, P = 7" Standard Tin Termination Plastic Tape<br>X, Q = 4 1/4" Standard Tin Termination Plastic Tape<br>A, M = 7" Gold Termination Plastic Tape<br>F, N = 4 1/4" Gold Termination Plastic Tape | <b>ESR in mΩ</b> |

### TECHNICAL SPECIFICATIONS

|                                    |   |     |     |     |    |    |    |    |  |
|------------------------------------|---|-----|-----|-----|----|----|----|----|--|
| Technical Data:                    | All technical data relate to an ambient temperature of +25°C                                  |     |     |     |    |    |    |    |  |
| Capacitance Range:                 | 1.0 µF to 100 µF  |     |     |     |    |    |    |    |  |
| Capacitance Tolerance:             | ±10%; ±20%  |     |     |     |    |    |    |    |  |
| Leakage Current DCL:               | 0.01CV or 0.5µA whichever is the greater  |     |     |     |    |    |    |    |  |
| Rated Voltage (V <sub>R</sub> )    | ≤ +85°C:  | 3   | 4   | 6.3 | 10 | 16 | 20 | 25 |  |
| Category Voltage (V <sub>C</sub> ) | ≤ +125°C:   | 2   | 2.7 | 4   | 7  | 10 | 13 | 17 |  |
| Surge Voltage (V <sub>S</sub> )    | ≤ +85°C:  | 3.9 | 5.2 | 8   | 13 | 20 | 26 | 32 |  |
| Surge Voltage (V <sub>S</sub> )    | ≤ +125°C:   | 2.6 | 3.2 | 5   | 8  | 12 | 16 | 20 |  |
| Temperature Range:                 | -55°C to +125°C   |     |     |     |    |    |    |    |  |
| Reliability:                       | 1% per 1000 hours at 85°C, V <sub>R</sub> with 0.1Ω/V series impedance, 60% confidence level  |     |     |     |    |    |    |    |  |
| Termination Finish:                | Tin Plating over Nickel (standard),<br>Gold Plating over Nickel option available upon request |     |     |     |    |    |    |    |  |

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

| Capacitance |      | Voltage Rating DC (V <sub>R</sub> ) at 85°C |                 |                 |                            |         |         |         |
|-------------|------|---|-----------------|-----------------|----------------------------|---------|---------|---------|
| µF          | Code | 3.0V  | 4.0V            | 6.3V            | 10V                        | 16V     | 20V     | 25V     |
| 1.0         | 105  |   |                 |                 | L(5000)                    |         |         | R(3000) |
| 1.5         | 155  |   |                 |                 |                            |         |         |         |
| 2.2         | 225  |   |                 | K(8000)/L(5000) | L(5000)                    | L(5000) |         |         |
| 3.3         | 335  |   |                 |                 | L(5000)                    |         |         |         |
| 4.7         | 475  | K(8000)                                     |                 |                 | L(5000)                    |         | R(2000) |         |
| 6.8         | 685  |   |                 |                 |                            |         |         |         |
| 10          | 106  |   |                 | L(4000)         | H(2500)<br>L(4000),R(1800) | R(1800) |         |         |
| 15          | 156  |   |                 | R(1800)         | R(1500)                    |         |         |         |
| 22          | 226  |   | L(5000)/R(1800) | R(1500)         | R(1500)                    |         |         |         |
| 33          | 336  | R(1800)                                     | H(1500)/R(1500) |                 | R(1500)                    |         |         |         |
| 47          | 476  | R(1500)                                     |                 | R(1800)         |                            |         |         |         |
| 68          | 686  |   |                 |                 |                            |         |         |         |
| 100         | 107  |   | R(1000)         |                 |                            |         |         |         |

Codes shown are examples of ESR values offered on certain CV and case size. Other codes and ESR values available upon request.

Released ratings, (ESR ratings in mOhms in parentheses)

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

### RATINGS & PART NUMBER REFERENCE

| AVX Part No.           | Case Size | Capacitance (µF) | Rated Voltage (V) | Rated Temperature (°C) | Category Voltage (V) | Category Temperature (°C) | DCL Max. (µA) | DF Max. (%) | ESR Max. @ 100kHz (mΩ) | 100kHz RMS Current (A) |       |       | Product Category | MSL |
|------------------------|-----------|------------------|-------------------|------------------------|----------------------|---------------------------|---------------|-------------|------------------------|------------------------|-------|-------|------------------|-----|
|                        |           |                  |                   |                        |                      |                           |               |             |                        | 25°C                   | 85°C  | 125°C |                  |     |
| <b>3 Volt @ 85°C</b>   |           |                  |                   |                        |                      |                           |               |             |                        |                        |       |       |                  |     |
| TPCK475*003#8000       | K         | 4.7              | 3                 | 85                     | 2                    | 125                       | 0.5           | 12          | 8000                   | 0.043                  | 0.039 | 0.017 | 3                | 1   |
| TPCR336*003#1800       | R         | 33               | 3                 | 85                     | 2                    | 125                       | 1.0           | 10          | 1800                   | 0.158                  | 0.142 | 0.063 | 2                | 1   |
| TPCR476*003#1500       | R         | 47               | 3                 | 85                     | 2                    | 125                       | 1.5           | 10          | 1500                   | 0.173                  | 0.156 | 0.069 | 3                | 1   |
| <b>4 Volt @ 85°C</b>   |           |                  |                   |                        |                      |                           |               |             |                        |                        |       |       |                  |     |
| TPCL226*004#5000       | L         | 22               | 4                 | 85                     | 2.7                  | 125                       | 0.9           | 6           | 5000                   | 0.071                  | 0.064 | 0.028 | 3                | 1   |
| TPCR226*004#1800       | R         | 22               | 4                 | 85                     | 2.7                  | 125                       | 0.9           | 8           | 1800                   | 0.158                  | 0.142 | 0.063 | 1                | 1   |
| TPCH336*004#1500       | H         | 33               | 4                 | 85                     | 2.7                  | 125                       | 1.3           | 14          | 1500                   | 0.163                  | 0.147 | 0.065 | 3                | 1   |
| TPCR336*004#1500       | R         | 33               | 4                 | 85                     | 2.7                  | 125                       | 1.3           | 10          | 1500                   | 0.173                  | 0.156 | 0.069 | 2                | 1   |
| TPCR107*004#1000       | R         | 100              | 4                 | 85                     | 2.7                  | 125                       | 4.0           | 30          | 1000                   | 0.212                  | 0.191 | 0.085 | 3                | 1   |
| <b>6.3 Volt @ 85°C</b> |           |                  |                   |                        |                      |                           |               |             |                        |                        |       |       |                  |     |
| TPCK225*006#8000       | K         | 2.2              | 6.3               | 85                     | 4                    | 125                       | 0.5           | 8           | 8000                   | 0.043                  | 0.039 | 0.017 | 3                | 1   |
| TPCL225*006#5000       | L         | 2.2              | 6.3               | 85                     | 4                    | 125                       | 0.5           | 6           | 5000                   | 0.071                  | 0.064 | 0.028 | 1                | 1   |
| TPCL106*006#4000       | L         | 10               | 6.3               | 85                     | 4                    | 125                       | 0.6           | 10          | 4000                   | 0.079                  | 0.071 | 0.032 | 3                | 1   |
| TPCR156*006#1800       | R         | 15               | 6.3               | 85                     | 4                    | 125                       | 0.9           | 8           | 1800                   | 0.158                  | 0.142 | 0.063 | 1                | 1   |
| TPCR226*006#1500       | R         | 22               | 6.3               | 85                     | 4                    | 125                       | 1.4           | 10          | 1500                   | 0.173                  | 0.156 | 0.069 | 1                | 1   |
| TPCR476*006#1800       | R         | 47               | 6.3               | 85                     | 4                    | 125                       | 3.0           | 20          | 1800                   | 0.158                  | 0.142 | 0.063 | 3                | 1   |
| <b>10 Volt @ 85°C</b>  |           |                  |                   |                        |                      |                           |               |             |                        |                        |       |       |                  |     |
| TPCL105*010#5000       | L         | 1.0              | 10                | 85                     | 7                    | 125                       | 0.5           | 6           | 5000                   | 0.071                  | 0.064 | 0.028 | 1                | 1   |
| TPCL225*010#5000       | L         | 2.2              | 10                | 85                     | 7                    | 125                       | 0.5           | 6           | 5000                   | 0.071                  | 0.064 | 0.028 | 1                | 1   |
| TPCL335*010#5000       | L         | 3.3              | 10                | 85                     | 7                    | 125                       | 0.5           | 8           | 5000                   | 0.071                  | 0.064 | 0.028 | 2                | 1   |
| TPCL475*010#5000       | L         | 4.7              | 10                | 85                     | 7                    | 125                       | 0.5           | 10          | 5000                   | 0.071                  | 0.064 | 0.028 | 2                | 1   |
| TPCH106*010#2500       | H         | 10               | 10                | 85                     | 7                    | 125                       | 1.0           | 8           | 2500                   | 0.126                  | 0.113 | 0.050 | 2                | 1   |
| TPCL106*010#4000       | L         | 10               | 10                | 85                     | 7                    | 125                       | 1.0           | 20          | 4000                   | 0.079                  | 0.071 | 0.032 | 3                | 1   |
| TPCR106*010#1800       | R         | 10               | 10                | 85                     | 7                    | 125                       | 1.0           | 8           | 1800                   | 0.158                  | 0.142 | 0.063 | 1                | 1   |
| TPCR156*010#1500       | R         | 15               | 10                | 85                     | 7                    | 125                       | 1.5           | 10          | 1500                   | 0.173                  | 0.156 | 0.069 | 1                | 1   |
| TPCR226*010#1500       | R         | 22               | 10                | 85                     | 7                    | 125                       | 2.2           | 14          | 1500                   | 0.173                  | 0.156 | 0.069 | 2                | 1   |
| TPCR336*010#1500       | R         | 33               | 10                | 85                     | 7                    | 125                       | 3.3           | 20          | 1500                   | 0.173                  | 0.156 | 0.069 | 3                | 1   |
| <b>16 Volt @ 85°C</b>  |           |                  |                   |                        |                      |                           |               |             |                        |                        |       |       |                  |     |
| TPCL225*016#5000       | L         | 2.2              | 16                | 85                     | 10                   | 125                       | 0.5           | 10          | 5000                   | 0.071                  | 0.064 | 0.028 | 1                | 1   |
| TPCR106*016#1800       | R         | 10               | 16                | 85                     | 10                   | 125                       | 1.6           | 10          | 1800                   | 0.158                  | 0.142 | 0.063 | 2                | 1   |
| <b>20 Volt @ 85°C</b>  |           |                  |                   |                        |                      |                           |               |             |                        |                        |       |       |                  |     |
| TPCR475*020#2000       | R         | 4.7              | 20                | 85                     | 13                   | 125                       | 0.9           | 8           | 2000                   | 0.150                  | 0.135 | 0.060 | 1                | 1   |
| <b>25 Volt @ 85°C</b>  |           |                  |                   |                        |                      |                           |               |             |                        |                        |       |       |                  |     |
| TPCR105*025#3000       | R         | 1.0              | 25                | 85                     | 17                   | 125                       | 0.5           | 8           | 3000                   | 0.122                  | 0.110 | 0.049 | 1                | 1   |

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.

For typical weight and composition see page 274.

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

### QUALIFICATION TABLE – CATEGORY 1

| TEST                  | TPC series (Temperature range -55°C to +125°C)  |               |               |                    |                                    |           |            |           |            |         |           |
|-----------------------|---|---------------|---------------|--------------------|------------------------------------|-----------|------------|-----------|------------|---------|-----------|
|                       | Condition   |               |               | Characteristics    |                                    |           |            |           |            |         |           |
| Endurance             | Apply rated voltage (Ur) at 85°C and / or category voltage (Uc) at 125°C for 2000 hours through a circuit impedance of $\leq 0.1\Omega/V$ . Stabilize at room temperature for 1-2 hours before measuring. |               |               | Visual examination | no visible damage                  |           |            |           |            |         |           |
|                       |   |               |               | DCL                | 1.25 x initial limit               |           |            |           |            |         |           |
|                       |   |               |               | $\Delta C/C$       | within $\pm 10\%$ of initial value |           |            |           |            |         |           |
|                       |   |               |               | DF                 | 1.5 x initial limit                |           |            |           |            |         |           |
|                       |   |               |               | ESR                | 1.5 x initial limit                |           |            |           |            |         |           |
| Humidity              | Store at 40°C and 90-95% relative humidity for 1344 hours, with no applied voltage. Stabilize at room temperature and humidity for 1-2 hours before measuring.  |               |               | Visual examination | no visible damage                  |           |            |           |            |         |           |
|                       |   |               |               | DCL                | initial limit                      |           |            |           |            |         |           |
|                       |   |               |               | $\Delta C/C$       | within $\pm 5\%$ of initial value  |           |            |           |            |         |           |
|                       |   |               |               | DF                 | 1.2 x initial limit                |           |            |           |            |         |           |
|                       |   |               |               | ESR                | 1.2 x initial limit                |           |            |           |            |         |           |
| Temperature Stability | Step  | Temperature°C | Duration(min) |                    | +20°C                              | -55°C     | +20°C      | +85°C     | +125°C     | +20°C   |           |
|                       | 1   | +20           | 15            | DCL                | IL*                                | n/a       | IL*        | 10 x IL*  | 12.5 x IL* | IL*     |           |
|                       | 2   | -55           | 15            |                    | $\Delta C/C$                       | n/a       | +0/-10%    | $\pm 5\%$ | +10/-0%    | +15/-0% | $\pm 5\%$ |
|                       | 3   | +20           | 15            | DF                 | IL*                                | 1.5 x IL* | IL*        | 1.5 x IL* | 2 x IL*    | IL*     |           |
|                       | 4   | +85           | 15            |                    | ESR                                | IL*       | 1.25 x IL* | IL*       | 1.25 x IL* | 2 x IL* | IL*       |
|                       | 5   | +125          | 15            |                    |                                    |           |            |           |            |         |           |
|                       | 6   | +20           | 15            |                    |                                    |           |            |           |            |         |           |
| Surge Voltage         | Apply 1.3x rated voltage (Ur) at 85°C for 1000 cycles of duration 6 min (30 sec charge, 5 min 30 sec discharge) through a charge / discharge resistance of 1000 $\Omega$ .                                |               |               | Visual examination | no visible damage                  |           |            |           |            |         |           |
|                       |   |               |               | DCL                | initial limit                      |           |            |           |            |         |           |
|                       |   |               |               | $\Delta C/C$       | within $\pm 10\%$ of initial value |           |            |           |            |         |           |
|                       |   |               |               | DF                 | initial limit                      |           |            |           |            |         |           |
|                       |   |               |               | ESR                | initial limit                      |           |            |           |            |         |           |

\*Initial Limit

### QUALIFICATION TABLE – CATEGORY 2

| TEST                  | TPC series (Temperature range -55°C to +125°C)  |               |               |                    |                                    |           |            |           |            |         |           |
|-----------------------|---|---------------|---------------|--------------------|------------------------------------|-----------|------------|-----------|------------|---------|-----------|
|                       | Condition   |               |               | Characteristics    |                                    |           |            |           |            |         |           |
| Endurance             | Apply rated voltage (Ur) at 85°C and / or category voltage (Uc) at 125°C for 2000 hours through a circuit impedance of $\leq 0.1\Omega/V$ . Stabilize at room temperature for 1-2 hours before measuring. |               |               | Visual examination | no visible damage                  |           |            |           |            |         |           |
|                       |   |               |               | DCL                | 1.25 x initial limit               |           |            |           |            |         |           |
|                       |   |               |               | $\Delta C/C$       | within $\pm 15\%$ of initial value |           |            |           |            |         |           |
|                       |   |               |               | DF                 | 1.5 x initial limit                |           |            |           |            |         |           |
|                       |   |               |               | ESR                | 1.5 x initial limit                |           |            |           |            |         |           |
| Humidity              | Store at 40°C and 90-95% relative humidity for 1344 hours, with no applied voltage. Stabilize at room temperature and humidity for 1-2 hours before measuring.  |               |               | Visual examination | no visible damage                  |           |            |           |            |         |           |
|                       |   |               |               | DCL                | initial limit                      |           |            |           |            |         |           |
|                       |   |               |               | $\Delta C/C$       | within $\pm 10\%$ of initial value |           |            |           |            |         |           |
|                       |   |               |               | DF                 | 1.2 x initial limit                |           |            |           |            |         |           |
|                       |   |               |               | ESR                | 1.2 x initial limit                |           |            |           |            |         |           |
| Temperature Stability | Step  | Temperature°C | Duration(min) |                    | +20°C                              | -55°C     | +20°C      | +85°C     | +125°C     | +20°C   |           |
|                       | 1   | +20           | 15            | DCL                | IL*                                | n/a       | IL*        | 10 x IL*  | 12.5 x IL* | IL*     |           |
|                       | 2   | -55           | 15            |                    | $\Delta C/C$                       | n/a       | +0/-15%    | $\pm 5\%$ | +15/-0%    | +20/-0% | $\pm 5\%$ |
|                       | 3   | +20           | 15            | DF                 | IL*                                | 1.5 x IL* | IL*        | 1.5 x IL* | 2 x IL*    | IL*     |           |
|                       | 4   | +85           | 15            |                    | ESR                                | IL*       | 1.25 x IL* | IL*       | 1.25 x IL* | 2 x IL* | IL*       |
|                       | 5   | +125          | 15            |                    |                                    |           |            |           |            |         |           |
|                       | 6   | +20           | 15            |                    |                                    |           |            |           |            |         |           |
| Surge Voltage         | Apply 1.3x rated voltage (Ur) at 85°C for 1000 cycles of duration 6 min (30 sec charge, 5 min 30 sec discharge) through a charge / discharge resistance of 1000 $\Omega$ .                                |               |               | Visual examination | no visible damage                  |           |            |           |            |         |           |
|                       |   |               |               | DCL                | 1.5 x initial limit                |           |            |           |            |         |           |
|                       |   |               |               | $\Delta C/C$       | within $\pm 15\%$ of initial value |           |            |           |            |         |           |
|                       |   |               |               | DF                 | 1.5 x initial limit                |           |            |           |            |         |           |
|                       |   |               |               | ESR                | 1.5 x initial limit                |           |            |           |            |         |           |

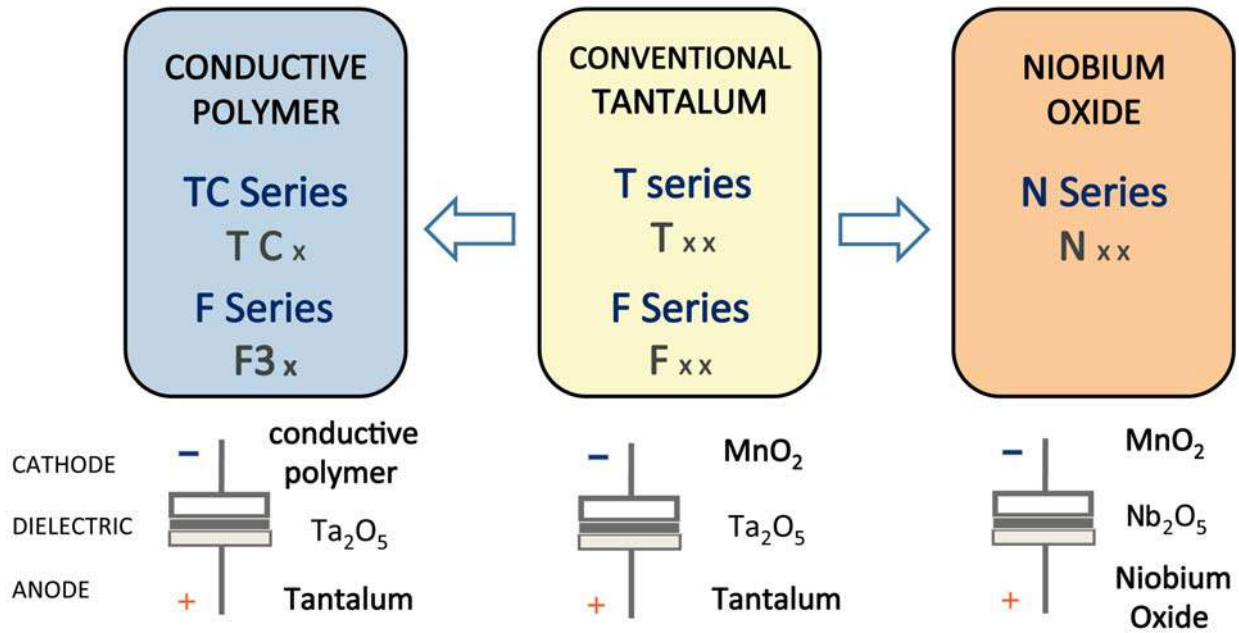
\*Initial Limit

### QUALIFICATION TABLE – CATEGORY 3

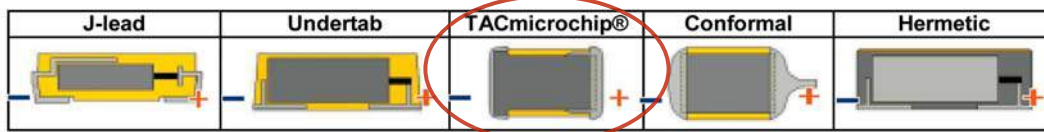
| TEST                         | TPC series (Temperature range -55°C to +125°C)  |               |               |                    |                                    |       |            |           |            |         |            |
|------------------------------|---|---------------|---------------|--------------------|------------------------------------|-------|------------|-----------|------------|---------|------------|
|                              | Condition   |               |               | Characteristics    |                                    |       |            |           |            |         |            |
| <b>Endurance</b>             | Apply rated voltage (Ur) at 85°C and / or category voltage (Uc) at 125°C for 2000 hours through a circuit impedance of $\leq 0.1\Omega/V$ . Stabilize at room temperature for 1-2 hours before measuring. |               |               | Visual examination | no visible damage                  |       |            |           |            |         |            |
|                              |   |               |               | DCL                | 1.25 x initial limit               |       |            |           |            |         |            |
|                              |   |               |               | $\Delta C/C$       | within $\pm 30\%$ of initial value |       |            |           |            |         |            |
|                              |   |               |               | DF                 | 1.5 x initial limit                |       |            |           |            |         |            |
|                              |   |               |               | ESR                | 1.5 x initial limit                |       |            |           |            |         |            |
| <b>Humidity</b>              | Store at 40°C and 90-95% relative humidity for 1344 hours, with no applied voltage. Stabilize at room temperature and humidity for 1-2 hours before measuring.  |               |               | Visual examination | no visible damage                  |       |            |           |            |         |            |
|                              |   |               |               | DCL                | 2 x initial limit                  |       |            |           |            |         |            |
|                              |   |               |               | $\Delta C/C$       | within $\pm 30\%$ of initial value |       |            |           |            |         |            |
|                              |   |               |               | DF                 | 1.5 x initial limit                |       |            |           |            |         |            |
|                              |   |               |               | ESR                | 1.25 x initial limit               |       |            |           |            |         |            |
| <b>Temperature Stability</b> | Step  | Temperature°C | Duration(min) |                    | +20°C                              | -55°C | +20°C      | +85°C     | +125°C     | +20°C   |            |
|                              | 1   | +20           | 15            | DCL                | IL*                                | n/a   | IL*        | 10 x IL*  | 12.5 x IL* | IL*     |            |
|                              | 2   | -55           | 15            |                    | $\Delta C/C$                       | n/a   | +0/-25%    | $\pm 5\%$ | +20/-0%    | +25/-0% | $\pm 20\%$ |
|                              | 3   | +20           | 15            | DF                 |                                    | IL*   | 1.5 x IL*  | IL*       | 1.5 x IL*  | 2 x IL* | 1.5 x IL*  |
|                              | 4   | +85           | 15            |                    | ESR                                | IL*   | 1.25 x IL* | IL*       | 1.25 x IL* | 2 x IL* | 1.5 x IL*  |
|                              | 5   | +125          | 15            |                    |                                    |       |            |           |            |         |            |
|                              | 6   | +20           | 15            |                    |                                    |       |            |           |            |         |            |
| <b>Surge Voltage</b>         | Apply 1.3x rated voltage (Ur) at 85°C for 1000 cycles of duration 6 min (30 sec charge, 5 min 30 sec discharge) through a charge / discharge resistance of 1000 $\Omega$ .                                |               |               | Visual examination | no visible damage                  |       |            |           |            |         |            |
|                              |   |               |               | DCL                | 2 x initial limit                  |       |            |           |            |         |            |
|                              |   |               |               | $\Delta C/C$       | within $\pm 30\%$ of initial value |       |            |           |            |         |            |
|                              |   |               |               | DF                 | 2 x initial limit                  |       |            |           |            |         |            |
|                              |   |               |               | ESR                | 2 x initial limit                  |       |            |           |            |         |            |

\*Initial Limit

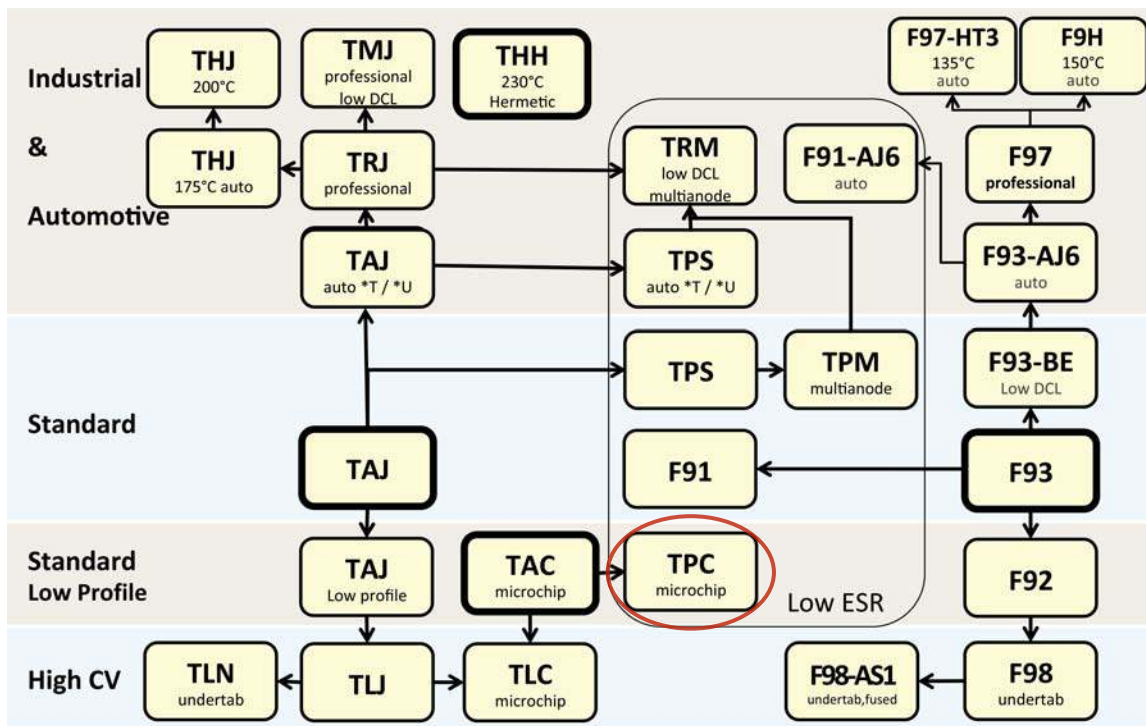
### AVX SOLID ELECTROLYTE CAPACITOR ROADMAP



### Five Capacitor Construction Styles



### SERIES LINE UP: CONVENTIONAL SMD MnO<sub>2</sub>



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