

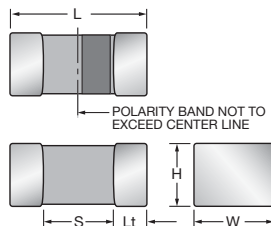
### FEATURES

- The world's smallest surface mount tantalum capacitor
- CV range: 1.0-220µF / 2-16V
- 5 case sizes available in low profile option
- Industrial and hi-rel medical applications



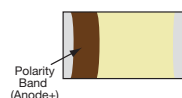
### APPLICATIONS

- Industrial portable applications



### MARKING

#### H, J, T, U, V 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 max        | Termination Spacing(S) | Minimum Termination Length (Lt) |
|------|----------|------------|---------------------------------|-------------------------------------------------|--------------|------------------------|---------------------------------|
| H    | 0805     | 2012-10    | 2.00 (0.079)                    | 1.35 (0.053)                                    | 1.00 (0.039) | 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) | 0.55 (0.022) min       | 0.15 (0.006)                    |
| T    | 1210     | 3528-12    | 3.50 ± 0.20<br>(0.138 ± 0.008)  | 2.80 +0.20<br>-0.10<br>(0.110 +0.008<br>-0.004) | 1.20 (0.047) | 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) | 0.70 (0.028) min       | 0.15 (0.006)                    |
| V    | 1206     | 3216-08    | 3.20 ± 0.20<br>(0.126 ± 0.008)  | 1.60 ± 0.20<br>(0.063 ± 0.008)                  | 0.75 (0.030) | 1.80 (0.071) min       | 0.15 (0.006)                    |

### HOW TO ORDER

|                                     |                                          |                                                                                                                                                      |                                           |                                                                                                            |                                                                                                                                                                                                               |                                                                          |
|-------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| <b>TAC</b><br>Type<br>TACmicrochip® | <b>U</b><br>Case Size<br>See table above | <b>475</b><br>Capacitance Code<br>pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow) | <b>*</b><br>Tolerance<br>K=±10%<br>M=±20% | <b>004</b><br>Rated DC Voltage<br>002=2Vdc<br>003=3Vdc<br>004=4Vdc<br>006=6.3Vdc<br>010=10Vdc<br>016=16Vdc | <b>R</b><br>Packaging<br>R = 7" Standard Tin Termination Plastic Tape<br>X = 4 1/4" Standard Tin Termination Plastic Tape<br>A = 7" Gold Termination Plastic Tape<br>F = 4 1/4" Gold Termination Plastic Tape | <b>TA</b><br>Alternative characters may be used for special requirements |
|-------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|

### TECHNICAL SPECIFICATIONS

|                                    |           |                                                                                              |     |     |     |    |    |  |
|------------------------------------|-----------|----------------------------------------------------------------------------------------------|-----|-----|-----|----|----|--|
| Technical Data:                    |           | All technical data relate to an ambient temperature of +25°C                                 |     |     |     |    |    |  |
| Capacitance Range:                 |           | 0.1 µF to 220 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:  | 2                                                                                            | 3   | 4   | 6.3 | 10 | 16 |  |
| Category Voltage (V <sub>C</sub> ) | ≤ +125°C: | 1.3                                                                                          | 2   | 2.7 | 4   | 7  | 10 |  |
| Surge Voltage (V <sub>S</sub> )    | ≤ +85°C:  | 2.7                                                                                          | 3.9 | 5.2 | 8   | 13 | 20 |  |
| Surge Voltage (V <sub>S</sub> )    | ≤ +125°C: | 1.7                                                                                          | 2.6 | 3.2 | 5   | 8  | 12 |  |
| 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:                |           | Nickel and Tin Plating (standard),<br>Nickel and Gold Plating option available upon request  |     |     |     |    |    |  |

## Low Profile

CAPACITANCE AND RATED VOLTAGE RANGE  
(LETTER DENOTES CASE SIZE)

| Capacitance          |                   | Voltage Rating DC (V <sub>R</sub> ) at 85°C |      |      |        |          |     |
|----------------------|-------------------|---------------------------------------------|------|------|--------|----------|-----|
| μF                   | Code              | 2.0V                                        | 3.0V | 4.0V | 6.3V   | 10V      | 16V |
| 0.10<br>0.15<br>0.22 | 104<br>154<br>224 |                                             |      |      |        |          |     |
| 0.33<br>0.47<br>0.68 | 334<br>474<br>684 |                                             |      |      |        |          |     |
| 1.0<br>1.5<br>2.2    | 105<br>155<br>225 |                                             |      |      |        | U        | U   |
| 3.3<br>4.7<br>6.8    | 335<br>475<br>685 |                                             |      | U    | U      |          |     |
| 10<br>15<br>22       | 106<br>156<br>226 | U                                           |      | J    | H<br>H | H/V<br>V |     |
| 33<br>47<br>68       | 336<br>476<br>686 |                                             | H    | H    | T      | T        |     |
| 100<br>150<br>220    | 107<br>157<br>227 |                                             | T    |      | T      |          |     |

Not recommended for new designs, higher voltage or smaller case size substitution are offered.

Released codes

Engineering samples - please contact manufacturer

\*Codes under development - subject to change.

Standard Height Profile: A, B, K, L, R Case

Low Profile: H, J, T, U, V Case

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

## RATINGS &amp; 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>(μA)<br>Max. | DF<br>%<br>Max. | ESR<br>Max. (Ω)<br>@ 100kHz | MSL | 100kHz RMS Current (mA) |      |       | Product<br>Category |
|-----------------|--------------|---------------------|-------------------------|------------------------------|----------------------------|---------------------------------|---------------------|-----------------|-----------------------------|-----|-------------------------|------|-------|---------------------|
|                 |              |                     |                         |                              |                            |                                 |                     |                 |                             |     | 25°C                    | 85°C | 125°C |                     |
| 2 Volt @ 85°C   |              |                     |                         |                              |                            |                                 |                     |                 |                             |     |                         |      |       |                     |
| TACU106*002#TA  | U            | 10                  | 2                       | 85                           | 1.3                        | 125                             | 0.5                 | 8               | 5                           | 1   | 84                      | 75   | 33    | 1                   |
| 3 Volt @ 85°C   |              |                     |                         |                              |                            |                                 |                     |                 |                             |     |                         |      |       |                     |
| TACH476*003#TA  | H            | 47                  | 3                       | 85                           | 2                          | 125                             | 1.4                 | 20              | 5                           | 1   | 89                      | 80   | 36    | 3                   |
| TACT227*003#TA  | T            | 220                 | 3                       | 85                           | 2                          | 125                             | 6.6                 | 20              | 1                           | 1   | 200                     | 180  | 80    | 3                   |
| 4 Volt @ 85°C   |              |                     |                         |                              |                            |                                 |                     |                 |                             |     |                         |      |       |                     |
| TACU475*004#TA  | U            | 4.7                 | 4                       | 85                           | 2.7                        | 125                             | 0.5                 | 8               | 5                           | 1   | 84                      | 75   | 33    | 1                   |
| TACJ106*004#TA  | J            | 10                  | 4                       | 85                           | 2.7                        | 125                             | 0.5                 | 20              | 7.5                         | 1   | 52                      | 46   | 21    | 3                   |
| TACH336*004#TA  | H            | 33                  | 4                       | 85                           | 2.7                        | 125                             | 1.3                 | 14              | 5                           | 1   | 89                      | 80   | 36    | 2                   |
| 6.3 Volt @ 85°C |              |                     |                         |                              |                            |                                 |                     |                 |                             |     |                         |      |       |                     |
| TACU335*006#TA  | U            | 3.3                 | 6.3                     | 85                           | 4                          | 125                             | 0.5                 | 8               | 5                           | 1   | 84                      | 75   | 33    | 1                   |
| TACH156*006#TA  | H            | 15                  | 6.3                     | 85                           | 4                          | 125                             | 0.9                 | 8               | 5                           | 1   | 89                      | 80   | 36    | 3                   |
| TACH226*006#TA  | H            | 22                  | 6.3                     | 85                           | 4                          | 125                             | 1.4                 | 10              | 5                           | 1   | 89                      | 80   | 36    | 2                   |
| TACT686*006#TA  | T            | 68                  | 6.3                     | 85                           | 4                          | 125                             | 4.3                 | 15              | 1                           | 1   | 200                     | 180  | 80    | 2                   |
| TACT107*006#TA  | T            | 100                 | 6.3                     | 85                           | 4                          | 125                             | 6.3                 | 12              | 1                           | 1   | 200                     | 180  | 80    | 2                   |
| 10 Volt @ 85°C  |              |                     |                         |                              |                            |                                 |                     |                 |                             |     |                         |      |       |                     |
| TACU225*010#TA  | U            | 2.2                 | 10                      | 85                           | 7                          | 125                             | 0.5                 | 8               | 5                           | 1   | 84                      | 75   | 33    | 1                   |
| TACH106*010#TA  | H            | 10                  | 10                      | 85                           | 7                          | 125                             | 1.0                 | 8               | 5                           | 1   | 89                      | 80   | 36    | 2                   |
| TACV106*010#TA  | V            | 10                  | 10                      | 85                           | 7                          | 125                             | 1.0                 | 10              | 2                           | 1   | 132                     | 119  | 53    | 2                   |
| TACV156*010#TA  | V            | 15                  | 10                      | 85                           | 7                          | 125                             | 1.5                 | 10              | 2                           | 1   | 132                     | 119  | 53    | 2                   |
| TACT476*010#TA  | T            | 47                  | 10                      | 85                           | 7                          | 125                             | 4.7                 | 12              | 1                           | 1   | 200                     | 180  | 80    | 1                   |
| 16 Volt @ 85°C  |              |                     |                         |                              |                            |                                 |                     |                 |                             |     |                         |      |       |                     |
| TACU105*016#TA  | U            | 1                   | 16                      | 85                           | 10                         | 125                             | 0.5                 | 8               | 5                           | 1   | 84                      | 75   | 33    | 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 200.

**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 – CATEGORY 1

| TEST                  | TAC low profile series (Temperature range -55°C to +125°C)                                                                                                                                                                                                                                     |               |               |                    |                              |            |       |            |            |       |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|--------------------|------------------------------|------------|-------|------------|------------|-------|
|                       | Condition                                                                                                                                                                                                                                                                                      |               |               | Characteristics    |                              |            |       |            |            |       |
| Endurance             | Determine after application of rated voltage for 2000 +48/-0 hours at 85±2°C and then leaving 1-2 hours at room temperature. Also determine of 125°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 ±10% of initial value |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DF                 | 1.5 x initial limit          |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ESR                | 1.5 x initial limit          |            |       |            |            |       |
| Humidity              | Determine after storage without applied voltage at 40±2°C and 90-95% relative humidity for 1344 +48/-0 hours and then recovery 1-2 hours at room temperature                                                                                                                                   |               |               | Visual examination | no visible damage            |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DCL                | initial limit                |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ΔC/C               | within ±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±2         | 15            | DCL                | IL*                          | n/a        | IL*   | 10 x IL*   | 12.5 x IL* | IL*   |
|                       | 2                                                                                                                                                                                                                                                                                              | -55+0/-3      | 15            |                    |                              |            |       |            |            |       |
|                       | 3                                                                                                                                                                                                                                                                                              | +20±2         | 15            | ΔC/C               | n/a                          | +0/-10%    | ±5%   | +10/-0%    | +15/-0%    | ±5%   |
|                       | 4                                                                                                                                                                                                                                                                                              | +85+3/-0      | 15            | DF                 | IL*                          | 1.5 x IL*  | IL*   | 1.5 x IL*  | 2 x IL*    | IL*   |
|                       | 5                                                                                                                                                                                                                                                                                              | +125+3/-0     | 15            | ESR                | IL*                          | 1.25 x IL* | IL*   | 1.25 x IL* | 2 x IL*    | IL*   |
|                       | 6                                                                                                                                                                                                                                                                                              | +20±2         | 15            |                    |                              |            |       |            |            |       |
| Surge Voltage         | Test temperature: 85°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, 5 min 30 sec discharge                                                          |               |               | Visual examination | no visible damage            |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DCL                | initial limit                |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ΔC/C               | within ±10% of initial value |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DF                 | initial limit                |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ESR                | initial limit                |            |       |            |            |       |

\*Initial Limit

### QUALIFICATION TABLE – CATEGORY 2

| TEST                  | TAC low profile series (Temperature range -55°C to +125°C)                                                                                                                                                                                                                                     |               |               |                    |                              |            |       |            |            |       |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|--------------------|------------------------------|------------|-------|------------|------------|-------|
|                       | Condition                                                                                                                                                                                                                                                                                      |               |               | Characteristics    |                              |            |       |            |            |       |
| Endurance             | Determine after application of rated voltage for 2000 +48/-0 hours at 85±2°C and then leaving 1-2 hours at room temperature. Also determine of 125°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 ±15% of initial value |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DF                 | 1.5 x initial limit          |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ESR                | 1.5 x initial limit          |            |       |            |            |       |
| Humidity              | Determine after storage without applied voltage at 40±2°C and 90-95% relative humidity for 1344 +48/-0 hours and then recovery 1-2 hours at room temperature                                                                                                                                   |               |               | Visual examination | no visible damage            |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DCL                | initial limit                |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ΔC/C               | within ±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±2         | 15            | DCL                | IL*                          | n/a        | IL*   | 10 x IL*   | 12.5 x IL* | IL*   |
|                       | 2                                                                                                                                                                                                                                                                                              | -55+0/-3      | 15            |                    |                              |            |       |            |            |       |
|                       | 3                                                                                                                                                                                                                                                                                              | +20±2         | 15            | ΔC/C               | n/a                          | +0/-15%    | ±5%   | +15/-0%    | +20/-0%    | ±5%   |
|                       | 4                                                                                                                                                                                                                                                                                              | +85+3/-0      | 15            | DF                 | IL*                          | 1.5 x IL*  | IL*   | 1.5 x IL*  | 2 x IL*    | IL*   |
|                       | 5                                                                                                                                                                                                                                                                                              | +125+3/-0     | 15            | ESR                | IL*                          | 1.25 x IL* | IL*   | 1.25 x IL* | 2 x IL*    | IL*   |
|                       | 6                                                                                                                                                                                                                                                                                              | +20±2         | 15            |                    |                              |            |       |            |            |       |
| Surge Voltage         | Test temperature: 85°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, 5 min 30 sec discharge                                                          |               |               | Visual examination | no visible damage            |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DCL                | 1.5 x initial limit          |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ΔC/C               | within ±15% of initial value |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DF                 | 1.5 x initial limit          |            |       |            |            |       |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ESR                | 1.5 x initial limit          |            |       |            |            |       |

\*Initial Limit

### QUALIFICATION TABLE – CATEGORY 3

| TEST                  | TAC low profile series (Temperature range -55°C to +125°C)                                                                                                                                                                                                                                     |               |               |                    |                              |            |       |            |            |           |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|--------------------|------------------------------|------------|-------|------------|------------|-----------|
|                       | Condition                                                                                                                                                                                                                                                                                      |               |               | Characteristics    |                              |            |       |            |            |           |
| Endurance             | Determine after application of rated voltage for 2000 +48/-0 hours at 85±2°C and then leaving 1-2 hours at room temperature. Also determine of 125°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 |            |       |            |            |           |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DF                 | 1.5 x initial limit          |            |       |            |            |           |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ESR                | 1.5 x initial limit          |            |       |            |            |           |
| Humidity              | Determine after storage without applied voltage at 40±2°C and 90-95% relative humidity for 1344 +48/-0 hours and then recovery 1-2 hours at room temperature                                                                                                                                   |               |               | Visual examination | no visible damage            |            |       |            |            |           |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DCL                | 2 x initial limit            |            |       |            |            |           |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ΔC/C               | within ±30% of initial value |            |       |            |            |           |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DF                 | 1.5 x initial limit          |            |       |            |            |           |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ESR                | 1.25 x initial limit         |            |       |            |            |           |
| Temperature Stability | Step                                                                                                                                                                                                                                                                                           | Temperature°C | Duration(min) |                    | +20°C                        | -55°C      | +20°C | +85°C      | +125°C     | +20°C     |
|                       | 1                                                                                                                                                                                                                                                                                              | +20±2         | 15            | DCL                | IL*                          | n/a        | IL*   | 10 x IL*   | 12.5 x IL* | IL*       |
|                       | 2                                                                                                                                                                                                                                                                                              | -55+0/-3      | 15            |                    |                              |            |       |            |            |           |
|                       | 3                                                                                                                                                                                                                                                                                              | +20±2         | 15            | ΔC/C               | n/a                          | +0/-25%    | ±5%   | +20/-0%    | +25/-0%    | ±20%      |
|                       | 4                                                                                                                                                                                                                                                                                              | +85+3/-0      | 15            | DF                 | IL*                          | 1.5 x IL*  | IL*   | 1.5 x IL*  | 2 x IL*    | 1.5 x IL* |
|                       | 5                                                                                                                                                                                                                                                                                              | +125+3/-0     | 15            |                    |                              |            |       |            |            |           |
|                       | 6                                                                                                                                                                                                                                                                                              | +20±2         | 15            | ESR                | IL*                          | 1.25 x IL* | IL*   | 1.25 x IL* | 2 x IL*    | 1.5 x IL* |
| Surge Voltage         | Test temperature: 85°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, 5 min 30 sec discharge                                                          |               |               | Visual examination | no visible damage            |            |       |            |            |           |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DCL                | 2 x initial limit            |            |       |            |            |           |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ΔC/C               | within ±30% of initial value |            |       |            |            |           |
|                       |                                                                                                                                                                                                                                                                                                |               |               | DF                 | 2 x initial limit            |            |       |            |            |           |
|                       |                                                                                                                                                                                                                                                                                                |               |               | ESR                | 2 x initial limit            |            |       |            |            |           |

\*Initial Limit