

# TLN PulseCap™ Series

## High Capacitance Tantalum Solid Electrolytic Chip Capacitors Undertab Series



### FEATURES

- Large Case Size for Maximum Capacitance
- 3x Reflow 260°C Compatible
- 100% Surge Current Tested
- Low Profile Solution
- Consumer Applications  
(e.g. PCMCIA/USB Wireless Express Cards etc.)
- CV Range: 1000-3300µF / 4-10V
- 2 Case Sizes Available



LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT



RoHS  
COMPLIANT

### APPLICATIONS

- Data Transfer Modems
- SSD Backup Circuits

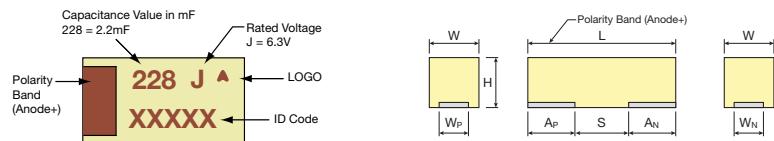
### CASE DIMENSIONS:

millimeters (inches)

| Code | EIA Code | EIA Metric | L $\pm$ 0.20 (0.008) | W $\pm$ 0.20 (0.008)<br>-0.10 (0.004) | H max.       | W <sub>P</sub> $\pm$ 0.10 (0.004) | W <sub>N</sub> $\pm$ 0.10 (0.004) | A <sub>P</sub> $\pm$ 0.10 (0.004) | A <sub>N</sub> $\pm$ 0.10 (0.004) | S Min.       |
|------|----------|------------|----------------------|---------------------------------------|--------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--------------|
| 4    | 2924     | 7361-20    | 7.30 (0.287)         | 6.10 (0.240)                          | 2.00 (0.079) | 4.75 (0.187)                      | 4.75 (0.187)                      | 2.00 (0.079)                      | 3.20 (0.126)                      | 2.10 (0.083) |
| 6    | 5831     | 14878-20   | 14.80 (0.583)        | 7.80 (0.307)                          | 2.00 (0.079) | 5.50 (0.217)                      | 5.50 (0.217)                      | 2.45 (0.096)                      | 2.45 (0.096)                      | 9.90 (0.390) |

### MARKING

#### 4, 6 CASE



### HOW TO ORDER

**TLN**      **6**      **228**      **M**      **006**      **R**      **0055**  
 Type      Case Size      Capacitance Code      Tolerance      Rated DC Voltage      Packaging      ESR in mΩ  
 See table      pF code: 1st two digits  
 above      represent significant  
 figures, 3rd digit represents  
 multiplier

### TECHNICAL SPECIFICATIONS

|                                    |  |     |     |    |  |
|------------------------------------|--|-----|-----|----|--|
| Technical Data:                    | All technical data relate to an ambient temperature of +25°C   |     |     |    |  |
| Capacitance Range:                 | 1000 µF to 3300 µF   |     |     |    |  |
| Capacitance Tolerance:             | ±20%   |     |     |    |  |
| Leakage Current DCL:               | 0.01CV   |     |     |    |  |
| Rated Voltage (V <sub>R</sub> )    | -55°C ≤ +40°C:   | 4   | 6.3 | 10 |  |
| Category Voltage (V <sub>C</sub> ) | at 85°C:   | 2   | 3.2 | 5  |  |
| Category Voltage (V <sub>C</sub> ) | at 125°C:  | 0.8 | 1.3 | 2  |  |
| Temperature Range:                 | -55°C to +125°C with category voltage  |     |     |    |  |
| Reliability:                       | 0.2% per 1000 hours at 85°C, 0.5xV <sub>R</sub> with 0.1Ω/V series impedance with 60% confidence level |     |     |    |  |

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

| Capacitance |      | Voltage Rating DC (VR) to 85°C |          |              |
|-------------|------|--------------------------------|----------|--------------|
| µF          | Code | 4V (G)                         | 6.3V (J) | 10V (A)      |
| 680         | 687  |                                |          |              |
| 1000        | 108  |                                |          | 4(100)/6(55) |
| 1500        | 158  |                                | 4(100)   | 6(55)        |
| 2200        | 228  |                                | 6(55)    |              |
| 3300        | 338  | 6(55)                          |          |              |

Released ratings (ESR ratings in mOhms in parentheses)

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

**RATINGS & PART NUMBER REFERENCE**

| Part Number            | Case Size | Capacitance (µF) | Rated Voltage (V) | Rated Temperature (°C) | Category Voltage (V) | Category Temperature (°C) | DCL Max. (µA) | ESR Max. @ 100kHz (mΩ) | 100kHz RMS Current (mA) |      |       | MSL |
|------------------------|-----------|------------------|-------------------|------------------------|----------------------|---------------------------|---------------|------------------------|-------------------------|------|-------|-----|
|                        |           |                  |                   |                        |                      |                           |               |                        | 25°C                    | 85°C | 125°C |     |
| <b>4 Volt @ 40°C</b>   |           |                  |                   |                        |                      |                           |               |                        |                         |      |       |     |
| TLN6338M004#0055       | 6         | 3300             | 4                 | 40                     | 0.8                  | 125                       | 132           | 55                     | 2045                    | 1840 | 818   | 3   |
| <b>6.3 Volt @ 40°C</b> |           |                  |                   |                        |                      |                           |               |                        |                         |      |       |     |
| TLN4158M006#0100       | 4         | 1500             | 6.3               | 40                     | 1.3                  | 125                       | 90            | 100                    | 1285                    | 1156 | 514   | 3   |
| TLN6228M006#0055       | 6         | 2200             | 6.3               | 40                     | 1.3                  | 125                       | 132           | 55                     | 2045                    | 1840 | 818   | 3   |
| <b>10 Volt @ 40°C</b>  |           |                  |                   |                        |                      |                           |               |                        |                         |      |       |     |
| TLN4108M010#0100       | 4         | 1000             | 10                | 40                     | 2                    | 125                       | 100           | 100                    | 1285                    | 1156 | 514   | 3   |
| TLN6108M010#0055       | 6         | 1000             | 10                | 40                     | 2                    | 125                       | 100           | 55                     | 2045                    | 1840 | 818   | 3   |
| TLN6158M010#0055       | 6         | 1500             | 10                | 40                     | 2                    | 125                       | 150           | 55                     | 2045                    | 1840 | 818   | 3   |

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.

ESR allowed to move up to 1.25 times catalogue limit post mounting

DCL allowed to move up to 2.00 times catalogue limit post mounting

For typical weight and composition, refer to the *Product Safety Information Datasheet* at the end of the Polymer, Tantalum and Niobium Oxide Capacitors catalog.

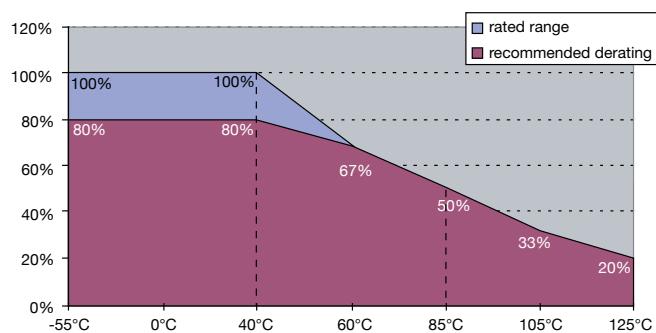
NOTE: KYOCERA AVX reserves the right to supply higher voltage ratings or tighter tolerance part in the same case size, to the same reliability standards.

## QUALIFICATION TABLE

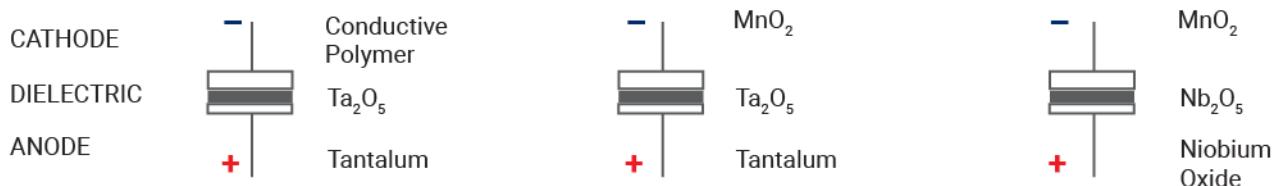
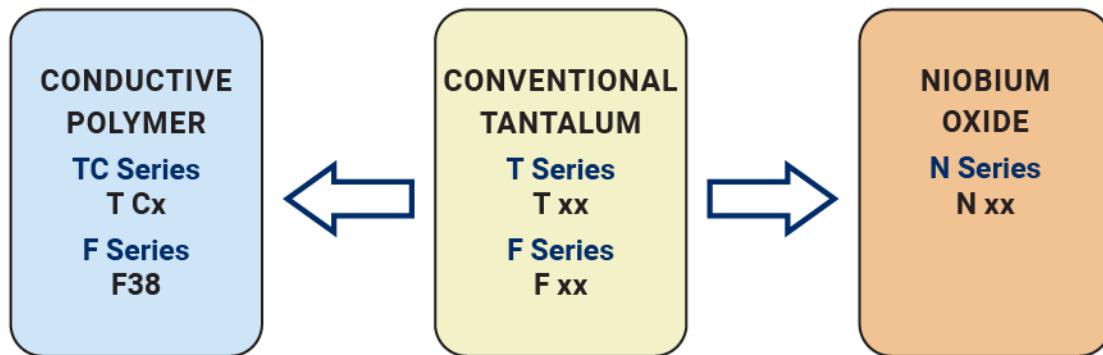
| TEST                  | TLN PulseCap™ series (Temperature range -55°C to +125°C)   |                    |                                    |                    |                                   |       |       |        |       |  |
|-----------------------|--|--------------------|------------------------------------|--------------------|-----------------------------------|-------|-------|--------|-------|--|
|                       | Condition  |                    | Characteristics                    |                    |                                   |       |       |        |       |  |
| Endurance             | Apply rated voltage (Ur) at 40°C and / or category voltage (Uc) at 85°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                | 2 x initial limit                  |                    |                                   |       |       |        |       |  |
|                       |  | $\Delta C/C$       | within +5/-30% of initial value    |                    |                                   |       |       |        |       |  |
|                       |  | ESR                | 1.25 x initial limit               |                    |                                   |       |       |        |       |  |
| Humidity              | Store at 65°C and 90-95% relative humidity for 500 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 $\pm 10\%$ of initial value |                    |                                   |       |       |        |       |  |
|                       |  | ESR                | 1.25 x initial limit               |                    |                                   |       |       |        |       |  |
| Temperature Stability | Step   | Temperature°C      | Duration(min)                      |                    |                                   |       |       |        |       |  |
|                       | 1  | +20                | 15                                 |                    |                                   |       |       |        |       |  |
|                       | 2  | -55                | 15                                 | DCL                | 2 x IL*                           |       |       |        |       |  |
|                       | 3  | +20                | 15                                 | $\Delta C/C$       | n/a                               |       |       |        |       |  |
|                       | 4  | +85                | 15                                 | ESR                | n/a                               |       |       |        |       |  |
|                       | 5  | +125               | 15                                 |                    |                                   |       |       |        |       |  |
|                       | 6  | +20                | 15                                 |                    |                                   |       |       |        |       |  |
| Surge Voltage         | Apply 1.3x rated voltage (Ur) at 40°C for 1000 cycles of duration 6 min (30 sec charge, 5 min 30 sec discharge) through a charge / discharge resistance of 1000Ω   |                    |                                    | +20°C              | -55°C                             | +20°C | +85°C | +125°C | +20°C |  |
|                       |  |                    |                                    | DCL                | 2 x IL*                           |       |       |        |       |  |
|                       |  |                    |                                    | $\Delta C/C$       | within $\pm 5\%$ of initial value |       |       |        |       |  |
|                       |  |                    |                                    | ESR                | 1.25 x initial limit              |       |       |        |       |  |
| Mechanical Shock      | MIL-STD-202, Method 213, Condition C   |                    |                                    | Visual examination | no visible damage                 |       |       |        |       |  |
|                       |  |                    |                                    | DCL                | initial limit                     |       |       |        |       |  |
|                       |  |                    |                                    | $\Delta C/C$       | within $\pm 5\%$ of initial value |       |       |        |       |  |
|                       |  |                    |                                    | DF                 | initial limit                     |       |       |        |       |  |
|                       |  |                    |                                    | ESR                | initial limit                     |       |       |        |       |  |
| Vibration             | MIL-STD-202, Method 204, Condition D   |                    |                                    | Visual examination | no visible damage                 |       |       |        |       |  |
|                       |  |                    |                                    | DCL                | initial limit                     |       |       |        |       |  |
|                       |  |                    |                                    | $\Delta C/C$       | within $\pm 5\%$ of initial value |       |       |        |       |  |
|                       |  |                    |                                    | DF                 | initial limit                     |       |       |        |       |  |
|                       |  |                    |                                    | ESR                | initial limit                     |       |       |        |       |  |

\*Initial Limit

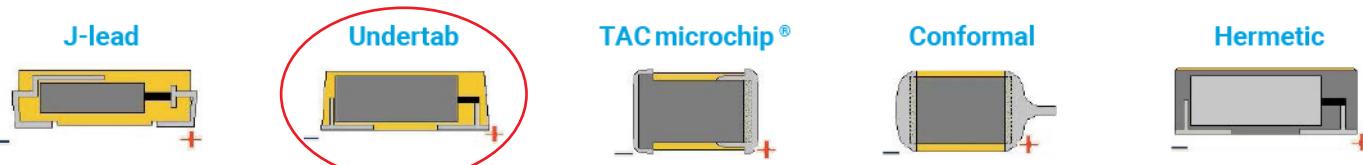
Voltage vs Temperature Rating



### SOLID ELECTROLYTIC CAPACITOR ROADMAP



### FIVE CAPACITOR CONSTRUCTION STYLES



### SERIES LINE UP : CONVENTIONAL SMD $MnO_2$

