Topdiode Manufacturing Company
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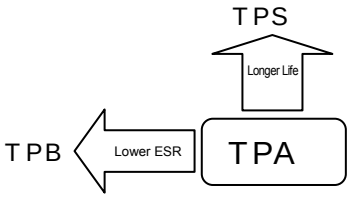
# T PA Series RADIAL LEAD TYPE, STANDARD

## CONDUCTIVE POLYMER ALUMINUM SOLID ELECTROLYTIC CAPACITORS

- Operating with wide temperature range -55~+105°C
- Low ESR, high ripple current
- Load life of 2000 hours
- RoHS & REACH compliant, Halogen-free





## SPECIFICATIONS

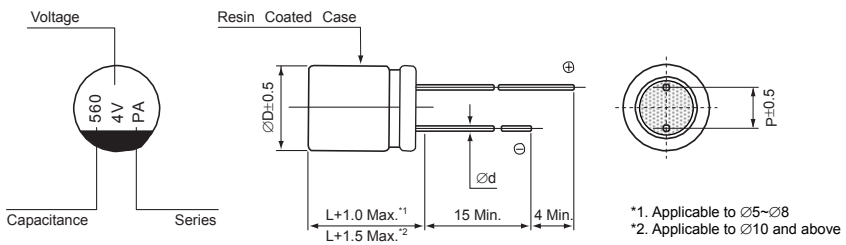
| Items | Characteristics |
|---|---|
| **Operation Temperature Range** | -55 ~ +105°C |
| **Voltage Range** | 2.5 ~ 25V |
| **Capacitance Range** | 6.8 ~ 1500μF |
| **Capacitance Tolerance** | ±20% at 120Hz, 20°C |
| **Leakage Current** (*1) | ≤Specified value (after 2 minutes application of rated voltage at 20°C). |
| **Dissipation Factor (tan δ)** | ≤Specified value at 120Hz, 20°C. |
| **ESR** (*2) | ≤Specified value at 100KHz, 20°C. |
| **Stability at Low Temperature** | Measurement frequency : 100KHz<br>Impedance Ratio ZT/Z20 (max.): Z(+105°C)/Z(20°C) ≤1.25; Z(-55°C)/Z(20°C) ≤1.25 |
| **Damp Heat (Steady State)** | When the capacitors are restored to 20°C after the rated voltage is applied for 1000 hours at 60°C, 90% RH, they meet the characteristics listed below.<br>Capacitance Change: Within ±20% of initial value (*3)<br>Dissipation Factor: 150% or less of initial specified value<br>ESR (*2): 150% or less of initial specified value<br>Leakage Current: Initial specified value or less |
| **Endurance** | After 2000 hours application of the rated voltage at 105°C, they meet the characteristics listed below.<br>Capacitance Change: Within ±20% of initial value (*3)<br>Dissipation Factor: 150% or less of initial specified value<br>ESR (*2): 150% or less of initial specified value<br>Leakage Current: Initial specified value or less |
| **Resistance to Soldering Heat** | After reflow soldering and restored at room temperature, they meet the characteristics listed below.<br>Capacitance Change: Within ±10% of initial value (*3)<br>Dissipation Factor: 130% or less of initial specified value<br>ESR (*2): 130% or less of initial specified value<br>Leakage Current: Initial specified value or less |
| **Marking** | Red print on the case top. |

(*1) If any doubt arises, measure the leakage current after the voltage treatment of applying DC rated voltage continuously to the capacitor for 120 minutes at 105°C.

(*2) Should be measured at both of the terminal ends closest to the capacitor body.

(*3) The value before test of examination of resistance to soldering.

## DRAWING (Unit: mm)



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CONDUCTIVE POLYMER ALUMINUM SOLID ELECTROLYTIC CAPACITORS

# T PA Series

## DIMENSIONS (Unit: mm)

| ØD × L | 5 × 7/9/11 | 6.3 × 6/7 | 6.3 × 8/9 | 6.3 × 10.5/11/12 | 8 × 7/8/9 | 8 × 11/12 | 10 × 8/10/13 |
|---|---|---|---|---|---|---|---|
| P | 2.0 | 2.5 | 2.5 | 2.5 | 3.5 | 3.5 | 5.0 |
| Ød | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| L | 7.0/9.0/11.0 | 6.0/7.0 | 8.0/9.0 | 10.5/11.0/12.0 | 7.0/8.0/9.0 | 11.0/12.0 | 8.0/10.0/13.0 |

## DIMENSIONS & STANDARD RATINGS

| WV (V) / Parameter / Cap. (μF) | | 2.5 | | | | | 4 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Case size ØD×L (mm) | Dissipation factor (tan δ) | Leakage current (μA) | ESR (mΩ) max. 20°C, 100KHz | Ripple current (mA rms) 105°C, 100KHz | Case size ØD×L (mm) | Dissipation factor (tan δ) | Leakage current (μA) | ESR (mΩ) max. 20°C, 100KHz | Ripple current (mA rms) 105°C, 100KHz |
| 270 | 277 | | | | | | 6.3 × 9<br>(6.3 × 10.5) | 0.08<br>(0.08) | 216<br>(216) | 7<br>(20) | 5600<br>(3200) |
| 330 | 337 | 6.3 × 9 | 0.08 | 165 | 7 | 5600 | | | | | |
| 390 | 397 | 6.3 × 10.5 | 0.08 | 195 | 20 | 3200 | 6.3 × 10.5 | 0.08 | 312 | 24 | 3300 |
| 560 | 567 | 6.3 × 9 | 0.08 | 280 | 7 | 5600 | 8 × 9<br>(8 × 12) | 0.08<br>(0.08) | 448<br>(448) | 7<br>(7) | 5200<br>(5500) |
| 680 | 687 | 8 × 9 | 0.08 | 340 | 7 | 4800 | 8 × 12 | 0.08 | 544 | 6 | 6200 |
| 820 | 827 | 6.3 × 9 | 0.08 | 410 | 7 | 5600 | 10 × 13 | 0.08 | 656 | 6 | 6500 |
| 1000 | 108 | 10 × 13 | 0.08 | 500 | 6 | 6500 | 10 × 13 | 0.08 | 800 | 6 | 6640 |
| 1200 | 128 | 10 × 13 | 0.08 | 600 | 8 | 5300 | 10 × 13 | 0.08 | 960 | 8 | 5600 |
| 1500 | 158 | 8 × 12 | 0.08 | 750 | 7 | 6100 | | | | | |

| WV (V) / Parameter / Cap. (μF) | | 6.3 | | | | | 10 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Case size ØD×L (mm) | Dissipation factor (tan δ) | Leakage current (μA) | ESR (mΩ) max. 20°C, 100KHz | Ripple current (mA rms) 105°C, 100KHz | Case size ØD×L (mm) | Dissipation factor (tan δ) | Leakage current (μA) | ESR (mΩ) max. 20°C, 100KHz | Ripple current (mA rms) 105°C, 100KHz |
| 47 | 476 | | | | | | 6.3 × 10.5 | 0.08 | 94 | 25 | 2900 |
| 68 | 686 | | | | | | 6.3 × 10.5 | 0.08 | 136 | 25 | 2900 |
| 100 | 107 | | | | | | 6.3 × 8<br>(6.3 × 10.5) | 0.08<br>(0.08) | 200<br>(200) | 25<br>(25) | 2900<br>(2900) |
| 150 | 157 | | | | | | 6.3 × 10.5 | 0.08 | 300 | 25 | 2900 |
| 220 | 227 | 5 × 7<br>(6.3 × 10.5) | 0.08<br>(0.08) | 277<br>(277) | 20<br>(20) | 3000<br>(3200) | 6.3 × 7 | 0.08 | 440 | 12 | 3150 |
| 270 | 277 | | | | | | 8 × 12 | 0.08 | 540 | 8 | 4900 |
| 330 | 337 | 6.3×10.5 | 0.08 | 416 | 24 | 3300 | | | | | |
| 470 | 477 | 8 × 9<br>(8 × 12) | 0.08<br>(0.08) | 592<br>(592) | 7<br>(7) | 5200<br>(5500) | 5 × 11<br>(8 × 8)<br>(10 × 13) | 0.08<br>(0.08)<br>(0.08) | 940<br>(940)<br>(940) | 16<br>(12)<br>(7) | 3000<br>(5300)<br>(5700) |
| 560 | 567 | | | | | | 10 × 13 | 0.08 | 1120 | 7 | 5900 |
| 680 | 687 | 10 × 13 | 0.08 | 857 | 6 | 6300 | 10 × 13 | 0.08 | 1360 | 7 | 6100 |

| WV (V) / Parameter / Cap. (μF) | | 16 | | | | | 20 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Case size ØD×L (mm) | Dissipation factor (tan δ) | Leakage current (μA) | ESR (mΩ) max. 20°C, 100KHz | Ripple current (mA rms) 105°C, 100KHz | Case size ØD×L (mm) | Dissipation factor (tan δ) | Leakage current (μA) | ESR (mΩ) max. 20°C, 100KHz | Ripple current (mA rms) 105°C, 100KHz |
| 22 | 226 | | | | | | 6.3 × 6 | 0.12 | 88 | 50 | 1700 |
| 39 | 396 | | | | | | 8 × 7 | 0.12 | 156 | 45 | 2000 |
| 47 | 476 | | | | | | 8 × 7 | 0.12 | 188 | 45 | 2000 |
| 56 | 566 | | | | | | 10 × 8 | 0.12 | 224 | 40 | 2400 |
| 68 | 686 | | | | | | 10 × 8 | 0.12 | 272 | 40 | 2600 |
| 82 | 826 | | | | | | 10 × 8 | 0.12 | 328 | 40 | 2600 |
| 100 | 107 | 5 × 8<br>(6.3 × 7)<br>(6.3 × 10.5) | 0.08<br>(0.08)<br>(0.08) | 320<br>(320)<br>(320) | 25<br>(25)<br>(24) | 2350<br>(2600)<br>(2900) | 8 × 12 | 0.12 | 400 | 22 | 3320 |
| 120 | 127 | | | | | | 10 × 10 | 0.12 | 480 | 35 | 2800 |
| 150 | 157 | | | | | | 10 × 13 | 0.12 | 600 | 20 | 4320 |
| 180 | 187 | 5 × 9<br>(8 × 8)<br>(8 × 12) | 0.08<br>(0.08)<br>(0.08) | 576<br>(576)<br>(576) | 12<br>(10)<br>(9) | 2750<br>(4200)<br>(5000) | | | | | |
| 220 | 227 | 6.3 × 8<br>(6.3 × 12) | 0.08<br>(0.08) | 704<br>(704) | 12<br>(12) | 3800<br>(4400) | | | | | |
| 270 | 277 | 8 × 8<br>(8 × 12) | 0.08<br>(0.08) | 864<br>(864) | 10<br>(9) | 4600<br>(5100) | | | | | |
| 330 | 337 | 10 × 13 | 0.08 | 1056 | 9 | 6100 | | | | | |
| 470 | 477 | 10 × 13 | 0.08 | 1504 | 9 | 6100 | | | | | |

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## DIMENSIONS & STANDARD RATINGS

| WV (V) / Parameter / Cap. (μF) | | 25 | | | | |
|---|---|---|---|---|---|---|
| | | Case size ØD×L (mm) | Dissipation factor (tan δ) | Leakage current (μA) | ESR (mΩ) max. 20°C, 100KHz | Ripple current (mA rms) 105°C, 100KHz |
| **6.8** | **685** | 6.3 × 6 | 0.12 | 34 | 80 | 1200 |
| **10** | **106** | 6.3 × 6 | 0.12 | 50 | 65 | 1500 |
| **22** | **226** | 8 × 7 | 0.12 | 110 | 60 | 1500 |
| **33** | **336** | 8 × 7 | 0.12 | 165 | 50 | 1800 |
| **47** | **476** | 6.3 × 7<br>(10 × 13) | 0.12<br>(0.12) | 235<br>(235) | 49<br>(30) | 1300<br>(3000) |
| **56** | **566** | 10 × 13 | 0.12 | 280 | 28 | 3800 |
| **100** | **107** | 5 × 11<br>(6.3 × 8)<br>(6.3 × 11) | 0.12<br>(0.12)<br>(0.12) | 500<br>(500)<br>(500) | 30<br>(30)<br>(30) | 2500<br>(2500)<br>(3000) |
| **220** | **227** | 6.3 × 12<br>(8 × 11) | 0.12<br>(0.12) | 1100<br>(1100) | 20<br>(18) | 4000<br>(4300) |

## How to order

| TPA | A | 108 | M | 0016 | B | 0025 |
|---|---|---|---|---|---|---|
| ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| Type | Material Code | Capacitance code | Tolerance | Rated DC Voltage | Package | Pitch size |
| TPA | A: Polymer electrolytic cap | pF Code: 1st two digits represent significant figures<br>3rd digit represents mulitplier (number of zeros to follow)<br>108 = 1000uF<br>158 = 1500uF | M: +/-20% | Code 0004 : 4VDC<br>0002 = 2.5VDC<br>0006 = 6.3VDC<br>0007 = 7.5VDC<br>0010 = 10VDC<br>0012 = 12VDC<br>0016 = 16VDC | B: Bulk | 0020: pitch size 2.0mm<br>0025: pitch size 2.5mm<br>0035: pitch size 3.5mm<br>0050: pitch size 5.0mm |