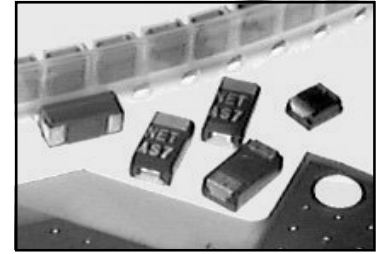


Surface Mount Polymer-Tantalum Capacitor

NTP Series

FEATURES

- Ultra Low ESR and High Ripple Current Ratings
- Values from 2.2 μ F to 470 μ F
- Suitable for Reflow Soldering
- Available in EIA J, P, A2, A, B2, B, C, V and D Case Sizes



CHARACTERISTICS

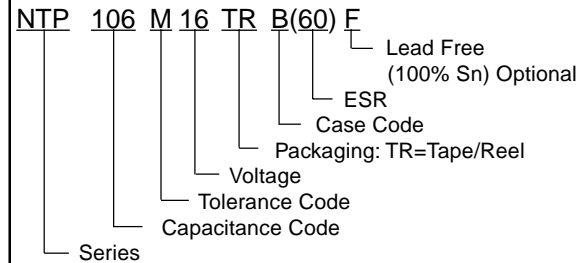
| | | |
|---|--|------------------|
| Capacitance Range | 2.2 μ F to 470 μ F | |
| Capacitance Tolerance | \pm 20% (M) | |
| Rated Working Voltage | 4.0Vdc to 10Vdc* | |
| Operating Temperature Range | -55°C ~ +105°C (derating above 85°C) | |
| Dissipation Factor (120Hz/20°C) | See specifications table | |
| Leakage Current Rating (after 5 minutes) | 0.1CV or 3 μ A whichever is greater | |
| Capacitance Change Verse Temperature | -55°C | +105°C |
| | Δ C - 20% | Δ C + 50% |
| Soldering Heat Resistance (+240°C for 5 ~ 10 sec.) | Δ Capacitance: \pm 20% Leakage Current: 130% of initial value Dissipation Factor: less than value in specifications table. | |
| Moisture Resistance (500 hours; 90~95% RH @40°C) | Δ Capacitance: + 30% ~ -20% Leakage Current: less than value in specifications table. Dissipation Factor: less than value in specifications table. | |
| Load Life Test (rated voltage @ 85°C) 1000 hours | Δ Capacitance: \pm 30% Leakage Current: less than value in specifications table. Dissipation Factor: 150% of value in specifications table. | |
| Base Failure Rate | 1%/1000 hours at +85°C | |

* It is recommended that the applied voltage be less than 80% of the rated voltage

CASE SIZES AND MAXIMUM DISSIPATION FACTOR

| Rated Voltage @ +85 °C | 4 | 6.3 | 10 | |
|-------------------------|------|---------------------|------------------------------|---------------------|
| Surge Voltage @ +85 °C | 5.2 | 8 | 13 | |
| Derated Voltage @ 105°C | 3.3 | 5 | 8 | |
| Capacitance μ F | Code | Case Sizes | Case Sizes | Case Sizes |
| 2.2 | 225 | - | J (4%) | - |
| 3.3 | 335 | - | J (4%) P (6%) | A (6%) |
| 4.7 | 475 | - | J (4%) P (6%) | A2/A (6%) |
| 6.8 | 685 | - | P/A (6%) | A (6%) B (8%) |
| 10 | 106 | P/A (6%) | P/A2/A (6%) | A (6%) B (8%) |
| 15 | 156 | - | A (6%) B (8%) | B (8%) C (9%) |
| 22 | 226 | B (8%) | A (6%) B2 (10%) B (8%) | B (8%) C (9%) |
| 33 | 336 | A (6%) | B2 (10%) B (8%) | B (8%) C (9%) |
| 47 | 476 | A (6%) B2 (10%) | B (8%) C (9%) | C (9%) V/D (10%) |
| 68 | 686 | C (9%) | B (8%) C (9%) | V/D (10%) |
| 100 | 107 | B (8%) | B (8%) C (9%) | V/D (10%) |
| 150 | 157 | C (9%) | C (9%) V/D (10%) | D (10%) |
| 220 | 227 | C (9%) V/D (10%) | D (10%) | D (10%) |
| 330 | 337 | D (10%) | D (10%) | - |
| 470 | 477 | D (10%) | - | - |

PART NUMBERING SYSTEM



SURFACE MOUNT

Surface Mount Polymer-Tantalum Capacitor

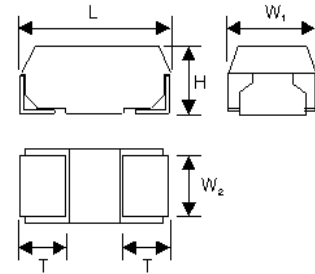
NTP Series

MAX. ESR (mΩ) @ 20°C/100KHz

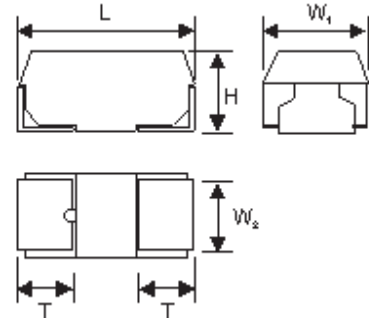
RIPPLE CURRENT (mA_{rms}) @20°C 1MHz/100KHz

| Capacitance(μF) | Working Voltage (Vdc) | | |
|-----------------|---|--|---|
| | 4 | 6.3 | 10 |
| 2.2 | - | J(600)=129/96 | - |
| 3.3 | - | J(600)=129/96 P(500)=224/168 | A(800)=652/489 |
| 4.7 | - | J(600)=129/96 P(500)=224/168 | A2(500)=346/259 A(800)=306/229 |
| 6.8 | - | P(500)=224/168 A(800)=306/229 | B(500)=412/309 |
| 10 | P(500)=224/168 A(500)=387/290 | P(500)=224/168 A2(500)=346/259 A(500)=387/290 | A(300)=500/375 B(300)=532/399 |
| 15 | - | A(500)=387/290 B(300)=532/399 | B(300)=532/399 C(200)=742/556 |
| 22 | B(300)=532/399 | A(500)=387/290 B2(80)=968/726 B(300)=532/399 | B(300)=532/399 C(150)=856/642 |
| 33 | A(500)=387/290 | B2(80)=968/726 B(300)=532/399 | B(200)=652/489 C(100)=1049/786 |
| 47 | A(200)=612/459 B2(80)=968/726 | B(200)=652/489 B(70)=1102/826 C(100)=1049/786 | C(100)=1049/786 V(60)=1443/1082 D(100)=1225/918 |
| 68 | C(100)=1049/786 | B(200)=652/489 B(70)=1102/826 C(100)=1049/786 | V(60)=1443/1082 D(100)=1225/918 |
| 100 | B(70)=1031/773 B(45)=1374/1030 | B(70)=1102/826 B(45)=1374/1030 C(100)=1049/786 | V(45)=1667/1250 D(55)=1651/1238 |
| 150 | C(100)=1049/786 | C(100)=1049/786 C(55)=1414/1060 V(45)=1667/1250 D(55)=1651/1238 D(40)=1936/1452 D(25)=2449/1836 | D(55)=1651/1238 D(40)=1936/1452 |
| 220 | C(55)=1414/1060 V(45)=1667/1250 D(55)=1651/1238 D(40)=1936/1452 D(25)=2449/1836 | D(55)=1651/1238 D(40)=1936/1452 | D(40)=1936/1452 D(25)=2449/1836 |
| 330 | D(40)=1936/1452 D(25)=2449/1836 D(15)=3162/2370 | D(40)=1936/1452 D(25)=2449/1836 | - |
| 470 | D(25)=2449/1836 D(18)=2887/2165 | - | - |

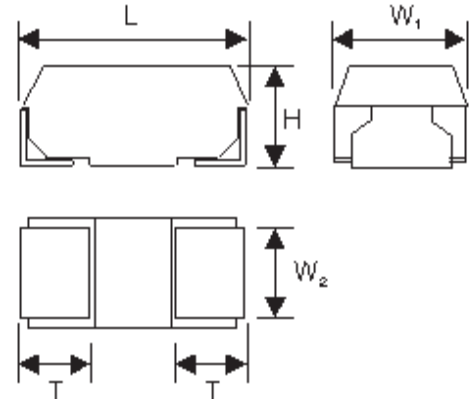
“J, P, A2, A” Case Size



“B2, B” Case Size



“C, V & D” Case Size



RIPPLE CURRENT TEMPERATURE DERATING

| 20°C | 85°C | 105°C |
|------|------|-------|
| 1.0 | 0.9 | 0.6 |

CASE DIMENSIONS (mm)

| Case Size | EIA Code | L | H | W ₁ | W ₂ | T |
|-----------|----------|-----------|-----------|----------------|----------------|------------|
| J | 0603 | 1.6 ± 0.1 | 0.8 ± 0.1 | 0.8 ± 0.1 | 0.8 ± 0.1 | 0.3 ± 0.15 |
| P | 2012 | 2.0 ± 0.2 | 1.1 ± 0.1 | 1.25 ± 0.2 | 0.9 ± 0.1 | 0.5 ± 0.1 |
| A2 | 3216L | 3.2 ± 0.2 | 1.1 ± 0.1 | 1.6 ± 0.2 | 1.2 ± 0.1 | 0.8 ± 0.3 |
| A | 3216 | 3.2 ± 0.2 | 1.6 ± 0.2 | 1.6 ± 0.2 | 1.2 ± 0.1 | 0.8 ± 0.3 |
| B2 | 3528L | 3.5 ± 0.2 | 1.1 ± 0.1 | 2.8 ± 0.2 | 2.2 ± 0.1 | 0.8 ± 0.3 |
| B | 3528 | 3.5 ± 0.2 | 1.9 ± 0.2 | 2.8 ± 0.2 | 2.3 ± 0.1 | 0.8 ± 0.3 |
| C | 6032 | 6.0 ± 0.2 | 2.5 ± 0.3 | 3.2 ± 0.2 | 1.8 ± 0.1 | 1.3 ± 0.3 |
| V | 7343 | 7.3 ± 0.2 | 1.9 ± 0.1 | 4.3 ± 0.2 | 2.4 ± 0.1 | 1.3 ± 0.3 |
| D | 7343 | 7.3 ± 0.2 | 2.8 ± 0.2 | 4.3 ± 0.2 | 2.4 ± 0.1 | 1.3 ± 0.3 |

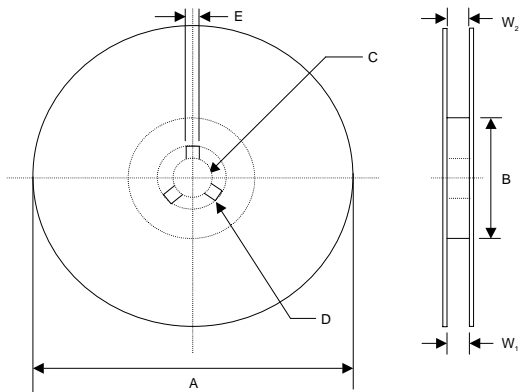
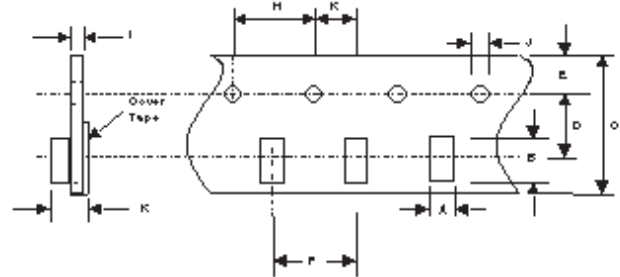


TAPE SPECIFICATIONS (mm)

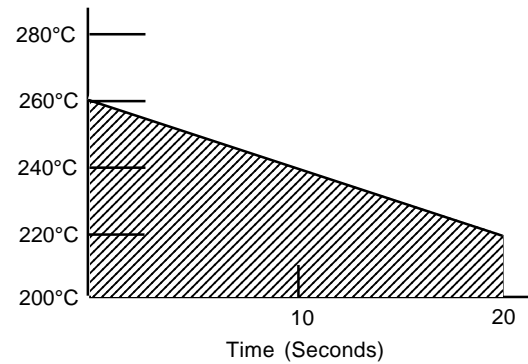
| Case Size | A +0.2 | B +0.2 | C +0.3 | D +0.1 | E +0.1 | F +0.1 | G +0.05 | H +0.1 | J +0.1 | K +0.2 | t max. | Reel Qty | | |
|-----------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|----------|------|------|
| J | 1.0 | 1.8 | 8.0 | 3.5 | 1.75 | 4.0 | 2.0 | 4.0 | φ 1.5 | 1.1 | 0.2 | 4000 | | |
| P | 1.4 | 2.2 | | | | | | | | 1.4 | | | 3000 | |
| A2 | 1.9 | 3.5 | | | | | | | | 1.4 | | | | 3000 |
| A | 1.9 | | | | | | | | | 1.9 | | | | |
| B2 | 3.2 | 3.8 | | | | | | | | 1.4 | | | | 3000 |
| B | 3.3 | | | | | | | | | 2.1 | | | | |
| C | 3.7 | 6.4 | 12.0 | 5.5 | 8.0 | 8.0 | 2.0 | 4.0 | φ 1.5 | 3.0 | 0.3 | 500 | | |
| V | 4.8 | 7.7 | | | | | | | | 2.1 | | | | |
| D | 4.8 | 7.7 | | | | | | | | 3.3 | | | | |

REEL SPECIFICATIONS (mm)

| Tape Width | A + 2.0 | B min. | C + 0.5 | D + 0.5 | E + 0.5 | W ₁ + 1.0 | W ₂ max. |
|------------|---------|--------|---------|---------|---------|----------------------|---------------------|
| 8 mm | φ 178 | φ 50 | φ 13 | φ 21 | 2.0 | 10 | 14.5 |
| 12 mm | φ 178 | φ 50 | φ 13 | φ 21 | 2.0 | 14.5 | 18.5 |



RECOMMENDED PEAK TEMPERATURE/TIME



RECOMMENDED LAND PATTERN (mm)

| Case Size | S max. | X min. | Y min. |
|-----------|--------|--------|--------|
| A | 1.1 | 3.8 | 1.5 |
| B | 1.4 | 4.1 | 2.7 |
| C | 2.9 | 6.9 | 2.7 |
| D | 4.1 | 8.2 | 2.9 |

