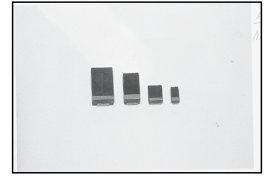


## FEATURES

- MOLDED CONSTRUCTION FOR HIGH SOLDERING HEAT RESISTANCE
- SEVEN CASE SIZES (P, A, B, C, V, D AND E)
- BOTH FLOW AND REFLOW SOLDERING APPLICABLE
- TAPE & REEL PACKAGING COMPATIBLE WITH AUTOMATIC PICK & PLACE EQUIPMENT



**RoHS Compliant**  
includes all homogeneous materials

\*See Part Number System for Details

## SPECIFICATIONS & PERFORMANCE CHARACTERISTICS

| Capacitance Range  | 0.1µF to 470µF   |     |     |          |    |    |          |    |    |
|--|--|-----|-----|----------|----|----|----------|----|----|
| Capacitance Tolerance                                      | ±10% (K), ±20% (M)   |     |     |          |    |    |          |    |    |
| Rated Voltage Range @ 85°C (Vdc)                           | 2.5  | 4.0 | 6.3 | 10       | 16 | 20 | 25       | 35 | 50 |
| Surge Voltage Rating @ 85°C (Vdc)                          | 3.3  | 5.2 | 8.0 | 13       | 20 | 28 | 33       | 46 | 85 |
| Derated Voltage @ 125°C (Vdc)                              | 1.8  | 2.5 | 4.0 | 6.3      | 10 | 13 | 16       | 22 | 32 |
| Operating Temperature Range                                | -55°C to +125°C (voltage derating at temperatures over +85°C as referenced above)        |     |     |          |    |    |          |    |    |
| Dissipation Factor   | See Case Size and Specifications Table   |     |     |          |    |    |          |    |    |
| Leakage Current @ +25°C (After 5 Minutes at Rated Voltage) | Not More Than 0.01CV or 0.5µA, whichever is greater                                      |     |     |          |    |    |          |    |    |
| Capacitance Change With Temperature                        | -55°C  |     |     | +85°C    |    |    | +125°C   |    |    |
| A2, A, B2, B, C, D & E Case Size                           | ΔC - 12%   |     |     | ΔC ± 12% |    |    | ΔC ± 12% |    |    |
| J & P Case Size  | ΔC - 20%   |     |     | ΔC ± 20% |    |    | ΔC ± 20% |    |    |
| Resistance to Soldering Heat (+260°C for 5 Seconds)        | ΔC ± 5%* Max, LC = Less than initial specification. DF = Less than initial specification |     |     |          |    |    |          |    |    |
| Moisture Resistance (500 hours; 90~95% RH @ 40°C)          | ΔC ± 5%* Max, LC = Less than initial specification. DF = 150% of initial specification   |     |     |          |    |    |          |    |    |
| Temperature Cycling (5 cycles; -55°C ~ +125°C)             | ΔC ± 5%* Max, LC = Less than initial specification. DF = Less than initial specification |     |     |          |    |    |          |    |    |
| Load Life (at Rated Voltage) (2,000 hours @ 85°C)          | ΔC ± 10%* Max, LC = 125% of initial specification. DF = Less than initial specification  |     |     |          |    |    |          |    |    |
| Base Failure Rate (1.0Ω/Volt)                              | 1%/1000 hours at 60% confidence level (+85°C)  |     |     |          |    |    |          |    |    |

\*±12% ~ ±15% for extended values, ±20% for P case size values

### RIPPLE CURRENT CORRECTION FACTOR:

| Ambient Temperature | 25°C | +55°C | +85°C | +105°C | +125°C |
|---------------------|------|-------|-------|--------|--------|
| Correction Factor   | 1.0  | 0.90  | 0.80  | 0.40   | 0.15   |

### RIPPLE CURRENT/VOLTAGE RATINGS:

$$I_{max.} = \sqrt{\frac{P_d}{ESR}} \quad V_{max.} = Z \cdot \sqrt{\frac{P_d}{ESR}}$$

I<sub>max.</sub> = Ripple Current rating (Arms)

P<sub>d</sub> = Power dissipation (watt)

ESR = Equivalent series resistance (ohm)

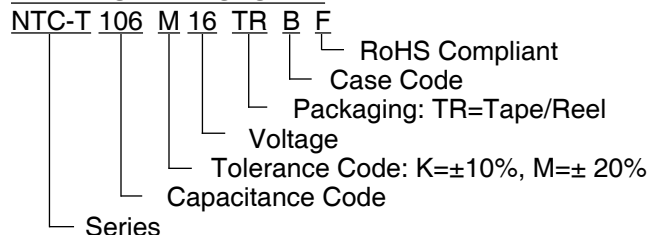
V<sub>max.</sub> = Ripple voltage rating (Vrms)

$$Z = \text{The capacitors impedance (ohm)} = \sqrt{(ESR)^2 + (XL - XC)^2}$$

### POWER DISSIPATION @ 25°C (FREE AIR) & EQUIVALENT SERIES INDUCTANCE (ESL)

| Case Code | Pd Max. (W) | ESL (nH) |
|-----------|-------------|----------|
| P         | 0.025       | 1.00     |
| A         | 0.070       | 1.20     |
| B         | 0.080       | 1.50     |
| C         | 0.110       | 2.70     |
| V         | 0.125       | -        |
| D         | 0.150       | 3.00     |
| E         | 0.165       | 3.00     |

### PART NUMBER SYSTEM



### PRECAUTIONS

Please review the notes on correct use, safety and precautions found on our website at [www.niccomp.com/tantpc](http://www.niccomp.com/tantpc)  
If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: [tpmg@niccomp.com](mailto:tpmg@niccomp.com)



### STANDARD AND EXTENDED PRODUCT SPECIFICATIONS TABLE

\*Extended Case Sizes

| Part Number      | Cap. (μF) | Voltage (Vdc) | Dissipation Factor @ 120Hz/20°C | Leakage Current (μA) @ 20°C | ESR (ohms) @ 100KHz/20°C | Ripple Current Rating (mA) @ 100KHz/25°C |
|------------------|-----------|---------------|---------------------------------|-----------------------------|--------------------------|--|
| NTC-T156K2.5TRAF | 15*       | 2.5           | 8%                              | 0.5                         | 5.0                      | 118                                      |
| NTC-T226M2.5TRPF | 22        | 2.5           | 20%                             | 0.55                        | 4.0                      | 79                                       |
| NTC-T226K2.5TRAF | 22*       | 2.5           | 8%                              | 0.55                        | 4.0                      | 132                                      |
| NTC-T336M2.5TRPF | 33        | 2.5           | 20%                             | 0.83                        | 5.0                      | 71                                       |
| NTC-T336K2.5TRAF | 33*       | 2.5           | 8%                              | 0.83                        | 3.5                      | 141                                      |
| NTC-T476K2.5TRAF | 47*       | 2.5           | 12%                             | 1.18                        | 4.5                      | 125                                      |
| NTC-T686K2.5TRAF | 68        | 2.5           | 18%                             | 1.7                         | 2.0                      | 187                                      |
| NTC-T686K2.5TRBF | 68        | 2.5           | 8%                              | 1.7                         | 2.0                      | 200                                      |
| NTC-T107K2.5TRAF | 100       | 2.5           | 30%                             | 2.5                         | 2.0                      | 187                                      |
| NTC-T107K2.5TRBF | 100       | 2.5           | 8%                              | 2.5                         | 2.0                      | 200                                      |
| NTC-T157K2.5TRBF | 150*      | 2.5           | 16%                             | 3.75                        | 5.0                      | 126                                      |
| NTC-T227K2.5TRBF | 220       | 2.5           | 18%                             | 5.5                         | 2.0                      | 200                                      |
| NTC-T477K2.5TRCF | 470       | 2.5           | 18%                             | 11.75                       | 1.2                      | 303                                      |
| NTC-T335M4TRPF   | 3.3       | 4             | 20%                             | 0.5                         | 20                       | 35                                       |
| NTC-T335K4TRAF   | 3.3       | 4             | 4%                              | 0.5                         | 8.0                      | 94                                       |
| NTC-T475M4TRPF   | 4.7       | 4             | 20%                             | 0.5                         | 12                       | 46                                       |
| NTC-T475K4TRAF   | 4.7       | 4             | 4%                              | 0.5                         | 7.5                      | 97                                       |
| NTC-T685M4TRPF   | 6.8       | 4             | 20%                             | 0.5                         | 12                       | 46                                       |
| NTC-T685K4TRAF   | 6.8*      | 4             | 8%                              | 0.5                         | 6.0                      | 108                                      |
| NTC-T106K4TRAF   | 10*       | 4             | 8%                              | 0.5                         | 5.0                      | 118                                      |
| NTC-T106K4TRBF   | 10        | 4             | 6%                              | 0.5                         | 3.5                      | 151                                      |
| NTC-T156K4TRAF   | 15*       | 4             | 8%                              | 0.6                         | 4.0                      | 132                                      |
| NTC-T156K4TRBF   | 15*       | 4             | 8%                              | 0.6                         | 3.0                      | 163                                      |
| NTC-T226K4TRAF   | 22*       | 4             | 8%                              | 0.88                        | 3.5                      | 141                                      |
| NTC-T226K4TRBF   | 22*       | 4             | 8%                              | 0.88                        | 2.8                      | 169                                      |
| NTC-T336K4TRAF   | 33*       | 4             | 10%                             | 1.32                        | 4.5                      | 39                                       |
| NTC-T336K4TRBF   | 33*       | 4             | 8%                              | 1.32                        | 2.4                      | 183                                      |
| NTC-T476K4TRAF   | 47        | 4             | 12%                             | 1.88                        | 5.0                      | 118                                      |
| NTC-T476K4TRBF   | 47*       | 4             | 8%                              | 1.88                        | 2.4                      | 188                                      |
| NTC-T476K4TRCF   | 47*       | 4             | 8%                              | 1.88                        | 1.8                      | 247                                      |
| NTC-T686K4TRAF   | 68        | 4             | 12%                             | 2.72                        | 2.5                      | 167                                      |
| NTC-T686K4TRBF   | 68*       | 4             | 8%                              | 2.72                        | 2.0                      | 200                                      |
| NTC-T686K4TRCF   | 68*       | 4             | 8%                              | 2.72                        | 1.6                      | 262                                      |
| NTC-T107K4TRAF   | 100       | 4             | 30%                             | 4.0                         | 2.0                      | 187                                      |
| NTC-T107K4TRBF   | 100*      | 4             | 12%                             | 4.0                         | 2.0                      | 200                                      |
| NTC-T107K4TRCF   | 100*      | 4             | 8%                              | 4.0                         | 1.2                      | 303                                      |
| NTC-T107K4TRDF   | 100*      | 4             | 8%                              | 4.0                         | 0.8                      | 433                                      |
| NTC-T157K4TRBF   | 150       | 4             | 18%                             | 6.0                         | 2.0                      | 200                                      |
| NTC-T157K4TRCF   | 150*      | 4             | 10%                             | 6.0                         | 1.0                      | 332                                      |
| NTC-T157K4TRDF   | 150*      | 4             | 8%                              | 6.0                         | 0.7                      | 463                                      |
| NTC-T227K4TRBF   | 220       | 4             | 18%                             | 8.8                         | 0.5                      | 400                                      |
| NTC-T227K4TRCF   | 220       | 4             | 12%                             | 8.8                         | 1.2                      | 303                                      |
| NTC-T227K4TRDF   | 220*      | 4             | 8%                              | 8.8                         | 0.7                      | 463                                      |
| NTC-T477K4TRDF   | 470       | 4             | 16%                             | 18.8                        | 1.0                      | 387                                      |
| NTC-T687K4TRDF   | 680*      | 4             | 25%                             | 27.2                        | 0.3                      | 707                                      |
| NTC-T105M6.3TRPF | 1.0       | 6.3           | 10%                             | 0.5                         | 25                       | 32                                       |
| NTC-T155M6.3TRPF | 1.5       | 6.3           | 10%                             | 0.5                         | 25                       | 32                                       |
| NTC-T225M6.3TRPF | 2.2       | 6.3           | 20%                             | 0.5                         | 20                       | 35                                       |
| NTC-T225K6.3TRAF | 2.2       | 6.3           | 4%                              | 0.5                         | 8.0                      | 94                                       |
| NTC-T335M6.3TRPF | 3.3       | 6.3           | 20%                             | 0.5                         | 13                       | 44                                       |
| NTC-T335K6.3TRAF | 3.3       | 6.3           | 4%                              | 0.5                         | 7.5                      | 97                                       |
| NTC-T475M6.3TRPF | 4.7       | 6.3           | 20%                             | 0.5                         | 12                       | 29                                       |
| NTC-T475K6.3TRAF | 4.7*      | 6.3           | 8%                              | 0.5                         | 6.0                      | 41                                       |
| NTC-T685K6.3TRPF | 6.8       | 6.3           | 20%                             | 0.5                         | 12                       | 29                                       |
| NTC-T685K6.3TRAF | 6.8*      | 6.3           | 8%                              | 0.5                         | 5.0                      | 45                                       |
| NTC-T685K6.3TRBF | 6.8*      | 6.3           | 6%                              | 0.5                         | 3.5                      | 53                                       |
| NTC-T106M6.3TRPF | 10        | 6.3           | 20%                             | 0.63                        | 12                       | 46                                       |
| NTC-T106K6.3TRAF | 10*       | 6.3           | 8%                              | 0.63                        | 4.0                      | 132                                      |
| NTC-T106K6.3TRBF | 10        | 6.3           | 6%                              | 0.63                        | 3.0                      | 163                                      |

Note: 20% (M) tolerance parts available special order



### STANDARD AND EXTENDED PRODUCT SPECIFICATIONS TABLE

\*Extended Case Sizes

| Part Number      | Cap. (µF) | Voltage (Vdc) | Dissipation Factor @ 120Hz/20°C | Leakage Current (µA) @ 20°C | ESR (ohms) @ 100KHz/20°C | Ripple Current Rating (mA) @ 100KHz/25°C |
|------------------|-----------|---------------|---------------------------------|-----------------------------|--------------------------|--|
| NTC-T156M6.3TRPF | 15        | 6.3           | 20%                             | 0.95                        | 5.0                      | 71                                       |
| NTC-T156K6.3TRBF | 15*       | 6.3           | 8%                              | 0.95                        | 2.5                      | 100                                      |
| NTC-T226M6.3TRPF | 22        | 6.3           | 20%                             | 1.39                        | 4.0                      | 79                                       |
| NTC-T226K6.3TRAF | 22*       | 6.3           | 10%                             | 1.39                        | 4.5                      | 125                                      |
| NTC-T226K6.3TRBF | 22*       | 6.3           | 8%                              | 1.39                        | 2.3                      | 187                                      |
| NTC-T226K6.3TRCF | 22        | 6.3           | 6%                              | 1.39                        | 1.8                      | 247                                      |
| NTC-T336K6.3TRAF | 33        | 6.3           | 12%                             | 2.08                        | 5.0                      | 118                                      |
| NTC-T336K6.3TRBF | 33*       | 6.3           | 8%                              | 2.08                        | 2.0                      | 200                                      |
| NTC-T336K6.3TRCF | 33*       | 6.3           | 8%                              | 2.08                        | 1.8                      | 247                                      |
| NTC-T476K6.3TRAF | 47        | 6.3           | 12%                             | 2.96                        | 2.0                      | 187                                      |
| NTC-T476K6.3TRBF | 47*       | 6.3           | 8%                              | 2.96                        | 2.0                      | 200                                      |
| NTC-T476K6.3TRCF | 47*       | 6.3           | 8%                              | 2.96                        | 1.6                      | 262                                      |
| NTC-T686K6.3TRBF | 68*       | 6.3           | 10%                             | 4.29                        | 1.8                      | 211                                      |
| NTC-T686K6.3TRCF | 68*       | 6.3           | 8%                              | 4.29                        | 1.2                      | 303                                      |
| NTC-T686K6.3TRDF | 68*       | 6.3           | 8%                              | 4.29                        | 0.8                      | 433                                      |
| NTC-T107K6.3TRBF | 100       | 6.3           | 12%                             | 6.3                         | 1.2                      | 258                                      |
| NTC-T107K6.3TRCF | 100*      | 6.3           | 10%                             | 6.3                         | 0.9                      | 350                                      |
| NTC-T107K6.3TRDF | 100       | 6.3           | 8%                              | 6.3                         | 0.8                      | 433                                      |
| NTC-T157K6.3TRBF | 150       | 6.3           | 12%                             | 9.45                        | 1.0                      | 283                                      |
| NTC-T157K6.3TRCF | 150       | 6.3           | 10%                             | 9.45                        | 1.2                      | 303                                      |
| NTC-T157K6.3TRDF | 150*      | 6.3           | 8%                              | 9.45                        | 0.7                      | 463                                      |
| NTC-T227K6.3TRCF | 220       | 6.3           | 14%                             | 13.9                        | 1.2                      | 303                                      |
| NTC-T227K6.3TRVF | 220       | 6.3           | 12%                             | 13.9                        | 0.5                      | 500                                      |
| NTC-T227K6.3TRDF | 220*      | 6.3           | 12%                             | 13.9                        | 0.8                      | 433                                      |
| NTC-T337K6.3TRDF | 330       | 6.3           | 14%                             | 20.8                        | 1.0                      | 387                                      |
| NTC-T477K6.3TRDF | 470       | 6.3           | 20%                             | 29.6                        | 0.3                      | 707                                      |
| NTC-T105M10TRPF  | 1         | 10            | 10%                             | 0.5                         | 25                       | 32                                       |
| NTC-T155K10TRAF  | 1.5       | 10            | 4%                              | 0.5                         | 8.0                      | 94                                       |
| NTC-T225M10TRPF  | 2.2       | 10            | 20%                             | 0.5                         | 20                       | 35                                       |
| NTC-T225K10TRAF  | 2.2       | 10            | 8%                              | 0.5                         | 5.5                      | 113                                      |
| NTC-T475M10TRPF  | 4.7       | 10            | 20%                             | 1.0                         | 10                       | 50                                       |
| NTC-T475K10TRAF  | 4.7*      | 10            | 8%                              | 1.0                         | 5.0                      | 118                                      |
| NTC-T475K10TRBF  | 4.7       | 10            | 4%                              | 1.0                         | 3.5                      | 151                                      |
| NTC-T685K10TRAF  | 6.8*      | 10            | 8%                              | 0.68                        | 4.5                      | 125                                      |
| NTC-T685K10TRBF  | 6.8       | 10            | 8%                              | 0.68                        | 3.0                      | 163                                      |
| NTC-T106M10TRPF  | 10        | 10            | 20%                             | 1.0                         | 6.0                      | 65                                       |
| NTC-T106K10TRAF  | 10*       | 10            | 8%                              | 1.0                         | 3.2                      | 148                                      |
| NTC-T106K10TRBF  | 10*       | 10            | 8%                              | 1.0                         | 2.5                      | 179                                      |
| NTC-T106K10TRCF  | 10        | 10            | 8%                              | 1.0                         | 1.8                      | 247                                      |
| NTC-T156K10TRCF  | 15        | 10            | 8%                              | 1.5                         | 1.8                      | 247                                      |
| NTC-T226K10TRAF  | 22        | 10            | 12%                             | 2.2                         | 2.5                      | 167                                      |
| NTC-T226K10TRBF  | 22*       | 10            | 8%                              | 2.2                         | 2.4                      | 183                                      |
| NTC-T226K10TRCF  | 22*       | 10            | 8%                              | 2.2                         | 1.8                      | 247                                      |
| NTC-T336K10TRBF  | 33        | 10            | 8%                              | 3.3                         | 2.0                      | 200                                      |
| NTC-T336K10TRCF  | 33*       | 10            | 8%                              | 3.3                         | 1.6                      | 262                                      |
| NTC-T336K10TRDF  | 33*       | 10            | 6%                              | 3.3                         | 0.8                      | 433                                      |
| NTC-T476K10TRBF  | 47        | 10            | 8%                              | 4.7                         | 3.0                      | 163                                      |
| NTC-T476K10TRCF  | 47*       | 10            | 8%                              | 4.7                         | 1.6                      | 262                                      |
| NTC-T476K10TRDF  | 47        | 10            | 8%                              | 4.7                         | 0.8                      | 433                                      |
| NTC-T686K10TRBF  | 68        | 10            | 12%                             | 6.8                         | 0.9                      | 298                                      |
| NTC-T686K10TRCF  | 68*       | 10            | 8%                              | 6.8                         | 1.2                      | 303                                      |
| NTC-T686K10TRDF  | 68*       | 10            | 8%                              | 6.8                         | 0.8                      | 433                                      |
| NTC-T107K10TRCF  | 100       | 10            | 10%                             | 10                          | 1.2                      | 303                                      |
| NTC-T107K10TRVF  | 100       | 10            | 8%                              | 10                          | 0.5                      | 500                                      |
| NTC-T107K10TRDF  | 100*      | 10            | 8%                              | 10                          | 0.7                      | 463                                      |
| NTC-T157K10TRDF  | 150*      | 10            | 10%                             | 15                          | 0.7                      | 463                                      |
| NTC-T227K10TRDF  | 220       | 10            | 12%                             | 22                          | 1.0                      | 387                                      |
| NTC-T227K10TRDF  | 220*      | 10            | 8%                              | 22                          | 0.9                      | 428                                      |
| NTC-T105M16TRPF  | 1.0       | 16            | 20%                             | 0.5                         | 25                       | 32                                       |

Note: 20% (M) tolerance parts available special order



## STANDARD AND EXTENDED PRODUCT SPECIFICATIONS TABLE

\*Extended Case Sizes

| Part Number     | Cap. (μF) | Voltage (Vdc) | Dissipation Factor @ 120Hz/20°C | Leakage Current (μA) @ 20°C | ESR (ohms) @ 100KHz/20°C | Ripple Current Rating (mA) @ 100KHz/25°C |
|-----------------|-----------|---------------|---------------------------------|-----------------------------|--------------------------|--|
| NTC-T105K16TRAF | 1.0       | 16            | 4%                              | 0.5                         | 10                       | 84                                       |
| NTC-T155K16TRAF | 1.5       | 16            | 4%                              | 0.5                         | 8.0                      | 94                                       |
| NTC-T225K16TRAF | 2.2       | 16            | 6%                              | 0.5                         | 6.0                      | 108                                      |
| NTC-T335K16TRAF | 3.3*      | 16            | 6%                              | 0.53                        | 5.0                      | 118                                      |
| NTC-T335K16TRBF | 3.3       | 16            | 4%                              | 0.53                        | 3.5                      | 151                                      |
| NTC-T475K16TRAF | 4.7*      | 16            | 6%                              | 0.75                        | 5.0                      | 118                                      |
| NTC-T475K16TRBF | 4.7       | 16            | 6%                              | 0.75                        | 3.0                      | 163                                      |
| NTC-T685K16TRAF | 6.8*      | 16            | 6%                              | 1.09                        | 5.0                      | 118                                      |
| NTC-T685K16TRBF | 6.8*      | 16            | 6%                              | 1.09                        | 2.5                      | 179                                      |
| NTC-T106K16TRAF | 10        | 16            | 8%                              | 1.6                         | 5.0                      | 118                                      |
| NTC-T106K16TRBF | 10*       | 16            | 6%                              | 1.6                         | 2.4                      | 183                                      |
| NTC-T106K16TRCF | 10        | 16            | 6%                              | 1.6                         | 1.8                      | 247                                      |
| NTC-T156K16TRAF | 15        | 16            | 12%                             | 2.4                         | 5.0                      | 118                                      |
| NTC-T156K16TRBF | 15*       | 16            | 6%                              | 2.4                         | 2.5                      | 167                                      |
| NTC-T156K16TRCF | 15*       | 16            | 6%                              | 2.4                         | 1.8                      | 247                                      |
| NTC-T226K16TRBF | 22*       | 16            | 6%                              | 3.52                        | 2.5                      | 179                                      |
| NTC-T226K16TRCF | 22*       | 16            | 6%                              | 3.52                        | 1.6                      | 209                                      |
| NTC-T226K16TRDF | 22        | 16            | 6%                              | 3.52                        | 0.8                      | 296                                      |
| NTC-T336K16TRBF | 33        | 16            | 8%                              | 5.28                        | 1.4                      | 239                                      |
| NTC-T336K16TRCF | 33*       | 16            | 6%                              | 5.28                        | 1.2                      | 303                                      |
| NTC-T336K16TRDF | 33*       | 16            | 6%                              | 5.28                        | 0.8                      | 433                                      |
| NTC-T476K16TRCF | 47*       | 16            | 6%                              | 7.52                        | 1.2                      | 303                                      |
| NTC-T476K16TRDF | 47*       | 16            | 6%                              | 7.52                        | 0.8                      | 433                                      |
| NTC-T686K16TRCF | 68        | 16            | 6%                              | 10.9                        | 0.7                      | 396                                      |
| NTC-T686K16TRDF | 68*       | 16            | 6%                              | 10.9                        | 0.7                      | 463                                      |
| NTC-T107K16TRDF | 100*      | 16            | 10%                             | 16.0                        | 1.0                      | 387                                      |
| NTC-T157K16TRDF | 150*      | 16            | 6%                              | 24.0                        | 0.9                      | 408                                      |
| NTC-T105K20TRAF | 1*        | 20            | 6%                              | 0.5                         | 9.0                      | 88                                       |
| NTC-T155K20TRAF | 1.5*      | 20            | 6%                              | 0.5                         | 6.5                      | 104                                      |
| NTC-T225K20TRAF | 2.2*      | 20            | 6%                              | 0.5                         | 6.0                      | 108                                      |
| NTC-T225K20TRBF | 2.2       | 20            | 4%                              | 0.5                         | 3.5                      | 151                                      |
| NTC-T335K20TRAF | 3.3*      | 20            | 6%                              | 0.66                        | 5.0                      | 118                                      |
| NTC-T335K20TRBF | 3.3*      | 20            | 6%                              | 0.66                        | 3.0                      | 163                                      |
| NTC-T475K20TRAF | 4.7*      | 20            | 6%                              | 0.94                        | 5.0                      | 118                                      |
| NTC-T475K20TRBF | 4.7*      | 20            | 6%                              | 0.94                        | 3.0                      | 163                                      |
| NTC-T475K20TRCF | 4.7       | 20            | 4%                              | 0.94                        | 2.4                      | 214                                      |
| NTC-T685K20TRBF | 6.8*      | 20            | 6%                              | 1.36                        | 2.8                      | 169                                      |
| NTC-T685K20TRCF | 6.8       | 20            | 6%                              | 1.36                        | 1.9                      | 241                                      |
| NTC-T106K20TRBF | 10*       | 20            | 6%                              | 2.0                         | 2.5                      | 179                                      |
| NTC-T106K20TRCF | 10*       | 20            | 6%                              | 2.0                         | 1.8                      | 247                                      |
| NTC-T106K20TRDF | 10        | 20            | 6%                              | 2.0                         | 1.3                      | 340                                      |
| NTC-T156K20TRCF | 15*       | 20            | 6%                              | 3.0                         | 1.7                      | 254                                      |
| NTC-T156K20TRDF | 15        | 20            | 6%                              | 3.0                         | 0.8                      | 433                                      |
| NTC-T226K20TRCF | 22*       | 20            | 6%                              | 4.4                         | 1.5                      | 271                                      |
| NTC-T226K20TRDF | 22*       | 20            | 6%                              | 4.4                         | 0.8                      | 433                                      |
| NTC-T336K20TRDF | 33*       | 20            | 6%                              | 6.6                         | 0.8                      | 433                                      |
| NTC-T476K20TRDF | 47*       | 20            | 6%                              | 9.4                         | 0.8                      | 433                                      |
| NTC-T474K25TRAF | 0.47      | 25            | 4%                              | 0.5                         | 14                       | 71                                       |
| NTC-T684K25TRAF | 0.68*     | 25            | 6%                              | 0.5                         | 10                       | 84                                       |
| NTC-T105K25TRAF | 1*        | 25            | 6%                              | 0.5                         | 8.0                      | 94                                       |
| NTC-T155K25TRAF | 1.5*      | 25            | 6%                              | 0.5                         | 8.0                      | 94                                       |
| NTC-T155K25TRBF | 1.5       | 25            | 4%                              | 0.5                         | 4.6                      | 132                                      |
| NTC-T225K25TRAF | 2.2*      | 25            | 6%                              | 0.55                        | 8.0                      | 94                                       |
| NTC-T225K25TRBF | 2.2       | 25            | 6%                              | 0.55                        | 4.0                      | 141                                      |
| NTC-T335K25TRBF | 3.3*      | 25            | 6%                              | 0.83                        | 3.5                      | 151                                      |
| NTC-T335K25TRCF | 3.3       | 25            | 4%                              | 0.83                        | 2.5                      | 210                                      |
| NTC-T475K25TRBF | 4.7*      | 25            | 6%                              | 1.18                        | 3.0                      | 163                                      |
| NTC-T475K25TRCF | 4.7       | 25            | 4%                              | 1.18                        | 2.4                      | 214                                      |
| NTC-T685K25TRBF | 6.8       | 25            | 6%                              | 1.7                         | 2.5                      | 179                                      |

Note: 20% (M) tolerance parts available special order



### STANDARD AND EXTENDED PRODUCT SPECIFICATIONS TABLE

\*Extended Case Sizes

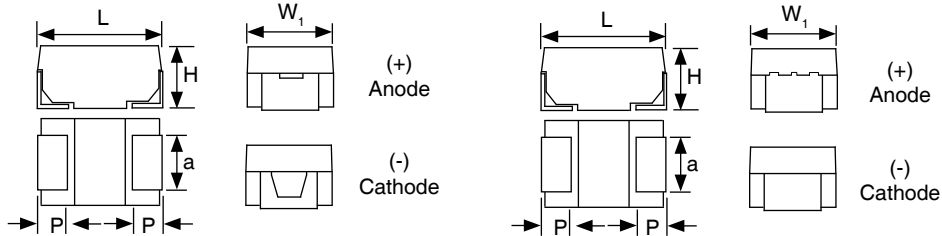
| Part NuKber     | Cap. (μF) | Voltage (Vdc) | Dissipation Factor @ 120Hz/20°C | Leakage Current (μA) @ 20°C | ESR (ohms) @ 100KHz/20°C | Ripple Current Rating (mA) @ 100KHz/25°C |
|-----------------|-----------|---------------|---------------------------------|-----------------------------|--------------------------|--|
| NTC-T685K25TRCF | 6.8*      | 25            | 6%                              | 1.7                         | 1.9                      | 241                                      |
| NTC-T106K25TRCF | 10*       | 25            | 6%                              | 2.5                         | 1.8                      | 247                                      |
| NTC-T106K25TRDF | 10        | 25            | 6%                              | 2.5                         | 1.2                      | 354                                      |
| NTC-T156K25TRCF | 15        | 25            | 6%                              | 3.75                        | 1.5                      | 271                                      |
| NTC-T156K25TRDF | 15*       | 25            | 6%                              | 3.75                        | 1.0                      | 387                                      |
| NTC-T226K25TRDF | 22*       | 25            | 6%                              | 5.5                         | 0.8                      | 433                                      |
| NTC-T336K25TRDF | 33        | 25            | 6%                              | 8.25                        | 0.7                      | 463                                      |
| NTC-T104K35TRAF | 0.1       | 35            | 4%                              | 0.5                         | 18                       | 62                                       |
| NTC-T224K35TRAF | 0.22      | 35            | 4%                              | 0.5                         | 18                       | 62                                       |
| NTC-T334K35TRAF | 0.33      | 35            | 4%                              | 0.5                         | 15                       | 68                                       |
| NTC-T474K35TRAF | 0.47*     | 35            | 6%                              | 0.5                         | 12                       | 76                                       |
| NTC-T474K35TRBF | 0.47      | 35            | 4%                              | 0.5                         | 8.0                      | 100                                      |
| NTC-T105K35TRAF | 1*        | 35            | 6%                              | 0.5                         | 8.0                      | 94                                       |
| NTC-T105K35TRBF | 1         | 35            | 4%                              | 0.5                         | 4.8                      | 129                                      |
| NTC-T155K35TRAF | 1.5*      | 35            | 6%                              | 0.53                        | 8.0                      | 94                                       |
| NTC-T155K35TRBF | 1.5*      | 35            | 6%                              | 0.53                        | 4.0                      | 141                                      |
| NTC-T155K35TRCF | 1.5       | 35            | 4%                              | 0.53                        | 3.0                      | 191                                      |
| NTC-T225K35TRAF | 2.2       | 35            | 6%                              | 0.77                        | 5.0                      | 118                                      |
| NTC-T225K35TRBF | 2.2*      | 35            | 6%                              | 0.77                        | 4.2                      | 138                                      |
| NTC-T225K35TRCF | 2.2       | 35            | 4%                              | 0.77                        | 3.0                      | 191                                      |
| NTC-T335K35TRBF | 3.3*      | 35            | 6%                              | 1.16                        | 4.0                      | 141                                      |
| NTC-T335K35TRCF | 3.3       | 35            | 4%                              | 1.16                        | 2.5                      | 210                                      |
| NTC-T475K35TRCF | 4.7       | 35            | 6%                              | 1.65                        | 2.2                      | 224                                      |
| NTC-T475K35TRDF | 4.7       | 35            | 4%                              | 1.65                        | 1.5                      | 316                                      |
| NTC-T685K35TRCF | 6.8*      | 35            | 6%                              | 2.38                        | 1.9                      | 241                                      |
| NTC-T685K35TRDF | 6.8       | 35            | 6%                              | 2.38                        | 1.3                      | 340                                      |
| NTC-T106K35TRCF | 10        | 35            | 6%                              | 3.5                         | 1.5                      | 271                                      |
| NTC-T106K35TRDF | 10        | 35            | 6%                              | 3.5                         | 1.0                      | 387                                      |
| NTC-T106K35TREF | 10*       | 35            | 6%                              | 3.5                         | 1.0                      | 406                                      |
| NTC-T156K35TRDF | 15*       | 35            | 6%                              | 5.25                        | 0.9                      | 408                                      |
| NTC-T105K50TRCF | 1         | 50            | 4%                              | 0.5                         | 5.5                      | 141                                      |
| NTC-T225K50TRDF | 2.2       | 50            | 4%                              | 1.1                         | 1.8                      | 289                                      |
| NTC-T335K50TRDF | 3.3       | 50            | 4%                              | 1.65                        | 1.4                      | 327                                      |
| NTC-T475K50TRDF | 4.7       | 50            | 4%                              | 2.35                        | 1.4                      | 327                                      |

Note: 20% (M) tolerance parts available special order

## DIMENSIONS (mm)

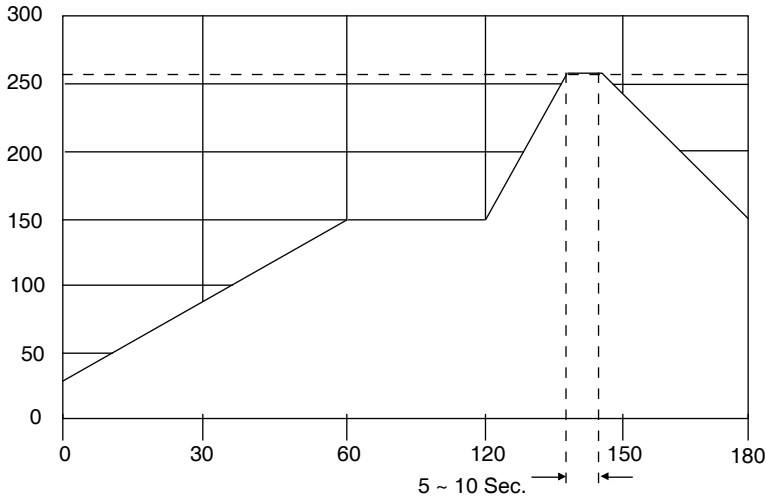
| Case Code | Metric Code | English Code | L         | W          | H         | P         | a         |
|-----------|-------------|--------------|-----------|------------|-----------|-----------|-----------|
| P         | 2012        | 0805         | 2.0 ± 0.2 | 1.25 ± 0.2 | 1.2 MAX.  | 0.5 ± 0.2 | 0.9 ± 0.1 |
| A         | 3216        | 1206         | 3.2 ± 0.2 | 1.6 ± 0.2  | 1.6 ± 0.2 | 0.8 ± 0.3 | 1.2 ± 0.1 |
| B         | 3528        | 1411         | 3.5 ± 0.2 | 2.8 ± 0.2  | 1.9 ± 0.2 | 0.8 ± 0.3 | 2.2 ± 0.1 |
| C         | 6032        | 2412         | 6.0 ± 0.3 | 3.2 ± 0.3  | 2.6 ± 0.4 | 1.3 ± 0.3 | 2.2 ± 0.1 |
| V         | 7343        | 2916         | 7.3 ± 0.2 | 4.3 ± 0.2  | 2.0 MAX.  | 1.3 ± 0.3 | 2.4 ± 0.1 |
| D         | 7343        | 2916         | 7.3 ± 0.2 | 4.3 ± 0.2  | 2.9 ± 0.3 | 1.3 ± 0.3 | 2.4 ± 0.1 |
| E         | 7343H       | 2917         | 7.3 ± 0.2 | 4.3 ± 0.2  | 4.1 ± 0.4 | 1.3 ± 0.3 | 2.4 ± 0.1 |

## LEAD-FRAME FORMAT\*



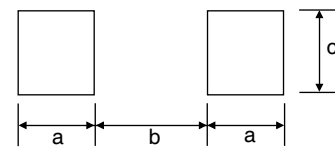
\*Parts will be supplied with one of the above lead-frame formats.

Flow/Reflow Soldering  
 Maximum Temperature/Time: Flow 260°C/5 Sec.  
 Reflow 260°C/10 Sec.



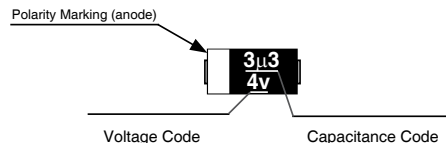
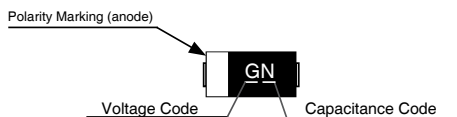
## RECOMMENDED LAND PATTERN DIMENSIONS (mm)

| Case Size | a    | b    | c    |
|-----------|------|------|------|
| P         | 1.05 | 0.50 | 1.20 |
| A         | 1.35 | 1.10 | 1.50 |
| B         | 1.35 | 1.40 | 2.70 |
| C         | 2.00 | 2.90 | 2.70 |
| D         | 2.05 | 4.10 | 2.90 |
| D         | 2.05 | 4.10 | 2.90 |

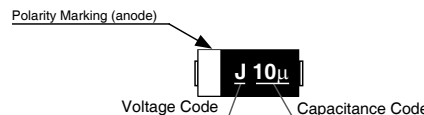
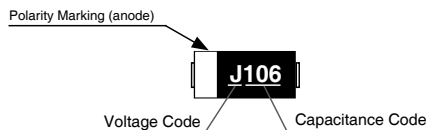


## COMPONENT MARKING

### P Case Size

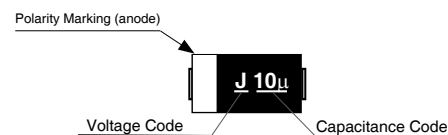
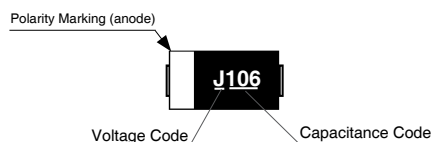


### A Case Size

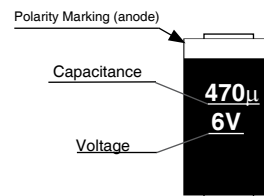
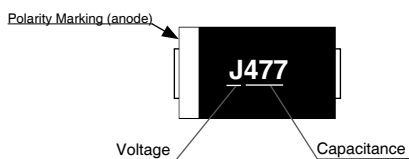


### B Case Size

2.5V marked 2, 6.3V marked 6



C, V, D & E Case Size  
2.5V marked 2, 6.3V marked 6



Note: Component body color may be Black(white marking) or Gold (black marking).

## CAPACITANCE CODES

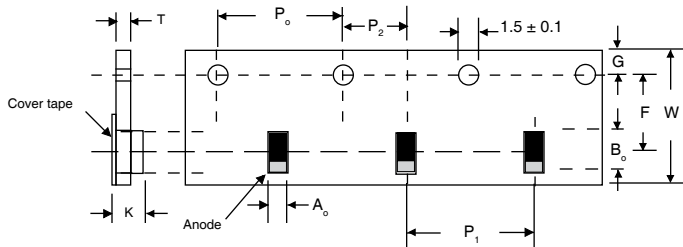
| Cap. ( $\mu\text{F}$ ) | STD EIA Code | EIA Code 198D | Code for P Case Size |
|------------------------|--------------|---------------|----------------------|
| 0.1                    | 104          | A5            | -                    |
| 0.15                   | 154          | E5            | -                    |
| 0.22                   | 224          | J5            | -                    |
| 0.33                   | 334          | N5            | N                    |
| 0.47                   | 474          | S5            | S                    |
| 0.68                   | 684          | W5            | W                    |
| 1.0                    | 105          | A6            | A                    |
| 1.5                    | 155          | E6            | E                    |
| 2.2                    | 225          | J6            | J                    |
| 3.3                    | 335          | N6            | N                    |
| 4.7                    | 475          | S6            | S                    |
| 6.8                    | 685          | W6            | W                    |
| 10                     | 106          | A7            | A                    |
| 22                     | 226          | J7            | J                    |
| 33                     | 336          | N7            | N                    |
| 47                     | 476          | S7            | S                    |

## VOLTAGE CODES

| Voltage | Code |
|---------|------|
| 2.5     | e    |
| 4       | G    |
| 6.3     | J    |
| 10      | A    |
| 16      | C    |
| 20      | D    |
| 25      | E    |
| 35      | V    |
| 50      | H    |

### TAPE DIMENSIONS (mm)

| Metric Code | Case Code | $A_0 \pm 0.2$ | $B_0 \pm 0.2$ | $W \pm 0.3$ | $F \pm 0.05$ | $P_0 \pm 0.1$ | $P_1 \pm 0.1$ | $P_2 \pm 0.05$ | $G \pm 0.1$ | $K \pm 0.2$ | T   | 7" Reel |
|-------------|-----------|---------------|---------------|-------------|--------------|---------------|---------------|----------------|-------------|-------------|-----|---------|
| 2012        | P         | 1.4           | 2.2           | 8.0         | 3.5          | 4.0           | 4.0           | 2.0            | 1.75        | 1.4         | 0.2 | 3000    |
| 3216        | A         | 1.9           | 3.5           | 8.0         | 3.5          | 4.0           | 4.0           | 2.0            | 1.75        | 1.9         | 0.2 | 2000    |
| 3528        | B         | 3.2           | 3.8           | 8.0         | 3.5          | 4.0           | 4.0           | 2.0            | 1.75        | 2.1         | 0.2 | 2000    |
| 6032        | C         | 3.7           | 6.4           | 12.0        | 5.65         | 4.0           | 8.0           | 2.0            | 1.5         | 3.0         | 0.3 | 500     |
| 7343        | V         | 4.8           | 7.7           | 12.0        | 5.65         | 4.0           | 8.0           | 2.0            | 1.5         | 2.4         | 0.3 | 500     |
| 7343        | D         | 4.8           | 7.7           | 12.0        | 5.65         | 4.0           | 8.0           | 2.0            | 1.5         | 3.3         | 0.3 | 500     |
| 7343H       | E         | 4.7           | 7.7           | 12.0        | 5.5          | 4.0           | 8.0           | 2.0            | 1.5         | 4.5         | 0.6 | 500     |



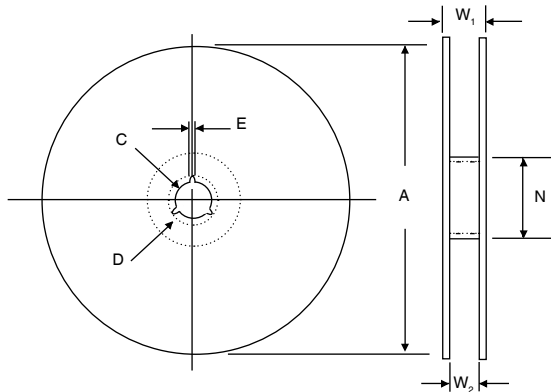
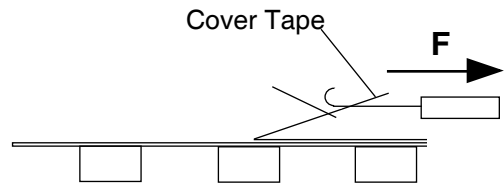
### Cover tape peel-off specification

1. Peel-off speed : 300 mm/min.
2. Peel-off force :  $F = 30 - 75g$
3. Peel-off angle :  $\Theta = 0 - 15^\circ$

Peel-off speed  
(F) = 50mm/Sec.

### REEL DIMENSIONS (mm)

| Tape Width | A         | C        | D        | E         | N       | $W_1$      | $W_2$     |
|------------|-----------|----------|----------|-----------|---------|------------|-----------|
| 8mm        | 178 ± 2.0 | 13 ± 0.5 | 21 ± 0.5 | 2.0 ± 0.5 | 50 min. | 10 ± 2.0   | 14.5 max. |
| 12mm       | 178 ± 2.0 | 13 ± 0.5 | 21 ± 0.5 | 2.0 ± 0.5 | 50 min. | 14.5 ± 2.0 | 18.5 max. |





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