

### FEATURES

- MOLDED CONSTRUCTION FOR HIGH SOLDERING HEAT RESISTANCE
- NINE CASE SIZES, MANY NEW EXTENDED RANGE RATINGS
- BOTH FLOW AND REFLOW SOLDERING APPLICABLE
- TAPE & REEL PACKAGING COMPATIBLE WITH AUTOMATIC PICK & PLACE EQUIPMENT

**RoHS  
Compliant**

includes all homogeneous materials



### SPECIFICATIONS & PERFORMANCE CHARACTERISTICS

\*See Part Number System for Details

|                                                               |                                                                                             |     |     |          |    |    |          |    |    |  |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----|-----|----------|----|----|----------|----|----|--|
| Capacitance Range                                             | 0.1μF to 680μF                                                                              |     |     |          |    |    |          |    |    |  |
| Capacitance Tolerance                                         | ±20% (M), ±10% (K)                                                                          |     |     |          |    |    |          |    |    |  |
| 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 +85°C (to +125°C with Derating)                                                    |     |     |          |    |    |          |    |    |  |
| Dissipation Factor                                            | See Case Size and Specifications Table                                                      |     |     |          |    |    |          |    |    |  |
| Leakage Current @ +25°C<br>(After 5 Minutes at Rated Voltage) | Not More Than 0.01CV or 0.5μA, whichever is greater                                         |     |     |          |    |    |          |    |    |  |
| Capacitance Change<br>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<br>(+260°C for 5 Seconds)        | ΔC ± 5%* Max, LC = Less than initial specification.<br>DF = Less than initial specification |     |     |          |    |    |          |    |    |  |
| Moisture Resistance<br>(500 hours; 90~95% RH @ 40°C)          | ΔC ± 5%* Max, LC = Less than initial specification.<br>DF = 150% of initial specification   |     |     |          |    |    |          |    |    |  |
| Temperature Cycling<br>(5 cycles; -55°C ~ +125°C)             | ΔC ± 5%* Max, LC = Less than initial specification.<br>DF = Less than initial specification |     |     |          |    |    |          |    |    |  |
| Load Life (at Rated Voltage)<br>(2,000 hours @ 85°C)          | ΔC ± 10%* Max, LC = 125% of initial specification.<br>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 J & 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:

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

$I_{max.}$  = Ripple Current rating (Arms)

$P_d$  = Power dissipation (watt)

$ESR$  = Equivalent series resistance (ohm)

$V_{max.}$  = Ripple voltage rating (Vrms)

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

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

| Case Code | $P_d$ Max. (W) | ESL (nH) |
|-----------|----------------|----------|
| P         | 0.025          | 1.00     |
| A2        | 0.050          | 1.20     |
| A         | 0.070          | 1.20     |
| B2        | 0.070          | 1.50     |
| B         | 0.080          | 1.50     |
| C         | 0.110          | 2.70     |
| D         | 0.150          | 3.00     |
| E         | 0.165          | 3.00     |

### PART NUMBER SYSTEM

NTC-T 106 M 16 TR B E

Series: NTC-T  
Capacitance Code: 106  
Tolerance Code: M = ±20%, K = ±10%  
Voltage: 16  
Packaging: TR = Tape/Reel  
Case Code: B  
RoHS Compliant: E

### STANDARD AND EXTENDED PRODUCT SPECIFICATIONS TABLE

\* Extended Case Sizes

Chart shows Case Size, Max Tan  $\delta$  @ 120Hz/+20°C, Max. ESR @ 100KHz/+20°C

| Cap. ( $\mu$ F) | Code | Working Voltage (Vdc)                                       |                                                                                                                                |                                                                                                        |                                                                                                         |                                                                                                         |                                                             |                                        |                                                             |                   |
|-----------------|------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------|-------------------------------------------------------------|-------------------|
|                 |      | 2.5                                                         | 4.0                                                                                                                            | 6.3                                                                                                    | 10                                                                                                      | 16                                                                                                      | 20                                                          | 25                                     | 35                                                          | 50                |
| 0.1             | 104  | -                                                           | -                                                                                                                              | -                                                                                                      | -                                                                                                       | -                                                                                                       | A2*6%/40 $\Omega$                                           | -                                      | A 4%/18 $\Omega$                                            | -                 |
| 0.15            | 154  | -                                                           | -                                                                                                                              | -                                                                                                      | -                                                                                                       | -                                                                                                       | A2*6%/325 $\Omega$                                          | -                                      | A 4%/18 $\Omega$                                            | A 4%/19 $\Omega$  |
| 0.22            | 224  | -                                                           | -                                                                                                                              | -                                                                                                      | -                                                                                                       | -                                                                                                       | A2*6%/35 $\Omega$                                           | -                                      | A 4%/18 $\Omega$                                            | B 4%/14 $\Omega$  |
| 0.33            | 334  | -                                                           | -                                                                                                                              | -                                                                                                      | -                                                                                                       | P 10%/40 $\Omega$                                                                                       | A2*6%/30 $\Omega$                                           | -                                      | A 4%/15 $\Omega$                                            | B 4%/10 $\Omega$  |
| 0.47            | 474  | -                                                           | -                                                                                                                              | -                                                                                                      | -                                                                                                       | P 10%/35 $\Omega$                                                                                       | A2*6%/27 $\Omega$                                           | A 4%/14 $\Omega$                       | A*6%/12 $\Omega$<br>B 4%/8.0 $\Omega$                       | B 4%/9.0 $\Omega$ |
| 0.68            | 684  | -                                                           | -                                                                                                                              | -                                                                                                      | P 10%/25 $\Omega$                                                                                       | P 10%/25 $\Omega$<br>A2*6%/25 $\Omega$                                                                  | A2*6%/15 $\Omega$<br>A 4%/12 $\Omega$                       | A*6%/10 $\Omega$                       | A*6%/9.0 $\Omega$<br>B 4%/5.4 $\Omega$                      | C 4%/7.0 $\Omega$ |
| 1.0             | 105  | -                                                           | -                                                                                                                              | P 10%/25 $\Omega$                                                                                      | P 10%/25 $\Omega$<br>A2*8%/25 $\Omega$                                                                  | J 10%/30 $\Omega$<br>P 20%/25 $\Omega$<br>A2*6%/16 $\Omega$<br>A 4%/10 $\Omega$                         | A2*6%/13 $\Omega$<br>A*6%/9.0 $\Omega$                      | A*6%/8.0 $\Omega$                      | A*6%/8.0 $\Omega$<br>B 4%/4.8 $\Omega$                      | C 4%/5.5 $\Omega$ |
| 1.5             | 155  | -                                                           | P 10%/25 $\Omega$                                                                                                              | P 10%/25 $\Omega$<br>A2*8%/25 $\Omega$                                                                 | J 20%/30 $\Omega$<br>P 20%/25 $\Omega$<br>A2*8%/20 $\Omega$<br>A 4%/8.0 $\Omega$                        | A2*6%/13 $\Omega$<br>A 4%/8.0 $\Omega$                                                                  | A2*6%/13 $\Omega$<br>A*6%/6.5 $\Omega$                      | A*6%/8.0 $\Omega$<br>B 4%/4.6 $\Omega$ | A*6%/8.0 $\Omega$<br>B*6%/4.0 $\Omega$<br>C 4%/3.0 $\Omega$ | C 4%/4.0 $\Omega$ |
| 2.2             | 225  | P 10%/25 $\Omega$                                           | P 10%/25 $\Omega$<br>A2*8%/25 $\Omega$                                                                                         | J 20%/20 $\Omega$<br>P 20%/20 $\Omega$<br>A2*8%/18 $\Omega$<br>A 4%/8.0 $\Omega$                       | J 20%/30 $\Omega$<br>P 20%/20 $\Omega$<br>A2*8%/12 $\Omega$<br>A 4%/7.0 $\Omega$                        | A2*6%/13 $\Omega$<br>A*6%/6.0 $\Omega$                                                                  | A*6%/6.0 $\Omega$<br>B 4%/3.5 $\Omega$                      | A*6%/8.0 $\Omega$<br>B*6%/4.0 $\Omega$ | B*6%/4.2 $\Omega$<br>C 4%/3.0 $\Omega$                      | D 4%/1.8 $\Omega$ |
| 3.3             | 335  | P 10%/25 $\Omega$                                           | P 20%/20 $\Omega$<br>A2*8%/18 $\Omega$<br>A 4%/8.0 $\Omega$                                                                    | J 20%/20 $\Omega$<br>P 20%/13 $\Omega$<br>A2*8%/9.0 $\Omega$<br>A 4%/7.5 $\Omega$                      | P 20%/20 $\Omega$<br>A2*8%/12 $\Omega$<br>A*8%/5.5 $\Omega$                                             | A*6%/5.0 $\Omega$<br>B 4%/3.5 $\Omega$                                                                  | A*6%/5.0 $\Omega$<br>B*6%/3.0 $\Omega$                      | B*6%/3.5 $\Omega$<br>C 4%/2.5 $\Omega$ | B*6%/4.0 $\Omega$<br>C 4%/2.5 $\Omega$<br>D 4%/2.0 $\Omega$ | D 4%/1.4 $\Omega$ |
| 4.7             | 475  | P 20%/20 $\Omega$<br>A2*8%/18 $\Omega$                      | P 20%/12 $\Omega$<br>A2*8%/10 $\Omega$<br>A 4%/7.5 $\Omega$                                                                    | J 20%/15 $\Omega$<br>P 20%/12 $\Omega$<br>A2*8%/7.5 $\Omega$<br>A*8%/6.0 $\Omega$                      | P 20%/10 $\Omega$<br>A2*8%/8.0 $\Omega$<br>A*8%/5.0 $\Omega$<br>B 4%/3.5 $\Omega$                       | A*6%/5.0 $\Omega$<br>B*6%/3.0 $\Omega$                                                                  | A*6%/5.0 $\Omega$<br>B*6%/3.0 $\Omega$<br>C 4%/2.4 $\Omega$ | B*6%/3.0 $\Omega$<br>C 4%/2.4 $\Omega$ | C*6%/2.2 $\Omega$<br>D 4%/1.5 $\Omega$                      | D 4%/1.4 $\Omega$ |
| 6.8             | 685  | P 20%/20 $\Omega$<br>A2*8%/16 $\Omega$                      | J 20%/15 $\Omega$<br>P 20%/12 $\Omega$<br>A2*8%/8.0 $\Omega$<br>A*8%/6.0 $\Omega$                                              | P 20%/12 $\Omega$<br>A2*8%/7.5 $\Omega$<br>A*8%/5.0 $\Omega$<br>B 6%/3.5 $\Omega$                      | A*8%/4.5 $\Omega$<br>B 8%/3.0 $\Omega$                                                                  | A2*6%/5.0 $\Omega$<br>A*6%/5.0 $\Omega$<br>B2 6%/5.0 $\Omega$<br>B*6%/2.5 $\Omega$<br>C 6%/1.9 $\Omega$ | B*6%/2.8 $\Omega$<br>C 6%/1.9 $\Omega$                      | C*6%/1.9 $\Omega$<br>D6%/1.4 $\Omega$  | C*6%/1.9 $\Omega$<br>D 6%/1.3 $\Omega$                      | -                 |
| 10              | 106  | J 20%/12 $\Omega$<br>P 20%/12 $\Omega$<br>A2*8%/15 $\Omega$ | J 20%/12 $\Omega$<br>P 20%/12 $\Omega$<br>A2*12%/8.0 $\Omega$<br>A*8%/5.0 $\Omega$<br>B 6%/3.5 $\Omega$                        | J 20%/8.0 $\Omega$<br>P 20%/12 $\Omega$<br>A2*8%/10 $\Omega$<br>A*8%/4.0 $\Omega$<br>B 6%/3.0 $\Omega$ | A2 8%/5.0 $\Omega$<br>A*8%/3.2 $\Omega$<br>B2*8%/3.2 $\Omega$<br>B*8%/2.5 $\Omega$<br>C 6%/1.8 $\Omega$ | A 8%/5.0 $\Omega$<br>B2 8%/4.0 $\Omega$<br>B*6%/2.4 $\Omega$<br>C 6%/1.8 $\Omega$                       | B*6%/2.5 $\Omega$<br>C*6%/1.8 $\Omega$<br>D 6%/1.3 $\Omega$ | C*6%/1.8 $\Omega$<br>D 6%/1.2 $\Omega$ | D*6%/1.0 $\Omega$                                           | -                 |
| 15              | 156  | A2*12%/10 $\Omega$<br>A*8%/5.0 $\Omega$                     | P 20%/A2*12%/8.0 $\Omega$<br>A*8%/4.0 $\Omega$<br>B*8%/3.0 $\Omega$                                                            | A2 12%/A*8%/3.5 $\Omega$<br>B2*8%/3.5 $\Omega$<br>B*8%/2.5 $\Omega$<br>C 6%/1.8 $\Omega$               | B2*8%/2.5 $\Omega$<br>C 6%/1.8 $\Omega$                                                                 | B2*6%/2.5 $\Omega$<br>C*6%/1.8 $\Omega$<br>D 6%/1.8 $\Omega$                                            | C*6%/1.7 $\Omega$<br>D 6%/0.8 $\Omega$                      | D*6%/1.0 $\Omega$                      | D*6%/0.9 $\Omega$                                           | -                 |
| 22              | 226  | A2*12%/10 $\Omega$<br>A*8%/4.0 $\Omega$                     | P 20%/5.0 $\Omega$<br>A2 12%/4.0 $\Omega$<br>A*8%/3.5 $\Omega$<br>B2*8%/3.5 $\Omega$<br>B*8%/2.8 $\Omega$<br>C 6%/1.8 $\Omega$ | A*10%/4.5 $\Omega$<br>B2*12%/4.5 $\Omega$<br>B*8%/2.3 $\Omega$<br>C 6%/1.8 $\Omega$                    | B2 12%/4.0 $\Omega$<br>B*8%/2.4 $\Omega$<br>C*8%/1.8 $\Omega$<br>D 6%/1.5 $\Omega$                      | B*6%/2.5 $\Omega$<br>C*6%/1.6 $\Omega$<br>D 6%/0.8 $\Omega$                                             | C*6%/1.5 $\Omega$<br>D*6%/0.8 $\Omega$                      | D*6%/0.8 $\Omega$                      | -                                                           | -                 |

### STANDARD AND EXTENDED PRODUCT SPECIFICATIONS TABLE

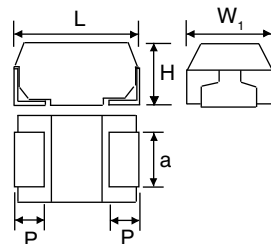
\*Extended Case Sizes  
Chart Shows Case Sizes, Max. Tan  $\delta$  @ 120Hz/20°C, Max. ESR @ 100KHz/20°C

| Cap ( $\mu$ F) | Code | Working Voltage (Vdc)                                                              |                                                                                                          |                                                                                    |                                                             |                                        |                   |          |
|----------------|------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------|-------------------|----------|
|                |      | 2.5                                                                                | 4.0                                                                                                      | 6.3                                                                                | 10                                                          | 16                                     | 20                | 25       |
| 33             | 336  | P 20%/5.0 $\Omega$<br>A*8%/3.5 $\Omega$<br>B2*8%/3.5 $\Omega$<br>B*8%/3.0 $\Omega$ | A*10%/4.5 $\Omega$<br>B212%/4.5 $\Omega$<br>B*8%/2.4 $\Omega$<br>C 6%/1.8 $\Omega$                       | A 12%/5.0 $\Omega$<br>B*8%/2.0 $\Omega$<br>C*8%/1.8 $\Omega$<br>D 6%/1.5 $\Omega$  | B*8%/2.0 $\Omega$<br>C*8%/1.6 $\Omega$<br>D 6%/0.8 $\Omega$ | C*6%/1.2 $\Omega$<br>D*6%/0.8 $\Omega$ | D*6%/0.8 $\Omega$ | D 6%/0.7 |
| 47             | 476  | A*12%/4.5 $\Omega$<br>B2*12%/4.5 $\Omega$<br>B*8%/2.4 $\Omega$                     | A 12%/5.0 $\Omega$<br>B2 12%/3.0 $\Omega$<br>B*8%/2.0 $\Omega$<br>C*8%/1.8 $\Omega$<br>D 6%/1.2 $\Omega$ | B2 12%/3.0 $\Omega$<br>B*8%/2.0 $\Omega$<br>C*8%/1.6 $\Omega$<br>D 6%/0.8 $\Omega$ | B 8%/3.0 $\Omega$<br>C*8%/1.6 $\Omega$<br>D*8%/0.8 $\Omega$ | C*6%/1.2 $\Omega$<br>D*6%/0.8 $\Omega$ | D*6%/0.8 $\Omega$ | -        |
| 68             | 686  | A 18%/3.0 $\Omega$<br>B*8%/2.0 $\Omega$                                            | B2 15%/3.0 $\Omega$<br>B*8%/2.0 $\Omega$<br>C*8%/1.6 $\Omega$<br>D 6%/0.8                                | B*10%/1.8 $\Omega$<br>C*8%/1.2 $\Omega$<br>D*8%/0.8 $\Omega$                       | C*8%/1.2 $\Omega$<br>D*8%/0.8 $\Omega$                      | D*6%/0.7 $\Omega$                      | -                 | -        |
| 100            | 107  | B2 18%/2.0 $\Omega$<br>B*8%/2.0 $\Omega$                                           | B*12%/2.0 $\Omega$<br>C*8%/1.2 $\Omega$<br>D*8%/0.8 $\Omega$                                             | B 12%/1.2 $\Omega$<br>C*10%/0.9 $\Omega$<br>D*8%/0.8 $\Omega$                      | C 10%/1.2 $\Omega$<br>D*8%/0.7 $\Omega$                     | D*10%/1.0 $\Omega$                     | -                 | -        |
| 150            | 157  | B*16%/5.0 $\Omega$                                                                 | B 18%/2.0 $\Omega$<br>C*10%/1.0 $\Omega$<br>D*8%/0.7 $\Omega$                                            | C 10%/1.2 $\Omega$<br>D*8%/0.7 $\Omega$                                            | D*10%/0.7 $\Omega$                                          | D*6%/0.9 $\Omega$                      | -                 | -        |
| 220            | 227  | B 18%/2.0 $\Omega$<br>C*12%/1.0 $\Omega$                                           | B 18%/0.5 $\Omega$<br>C 12%/1.2 $\Omega$<br>D*8%/0.7 $\Omega$                                            | C 14%/1.2 $\Omega$<br>D*12%/0.8 $\Omega$                                           | D 12%/1.0 $\Omega$<br>E*8%/0.9 $\Omega$                     | -                                      | -                 | -        |
| 330            | 337  | C 16%/1.2 $\Omega$                                                                 | C 14%/1.2 $\Omega$<br>D*14%/0.7 $\Omega$                                                                 | D 14%/1.0 $\Omega$                                                                 | -                                                           | -                                      | -                 | -        |
| 470            | 477  | C 18%/1.2 $\Omega$<br>D*14%/0.7 $\Omega$                                           | D 16%/1.0 $\Omega$                                                                                       | D 20%/0.3 $\Omega$                                                                 | -                                                           | -                                      | -                 | -        |
| 680            | 687  |                                                                                    | D 24%/0.3 $\Omega$                                                                                       | -                                                                                  | -                                                           | -                                      | -                 | -        |

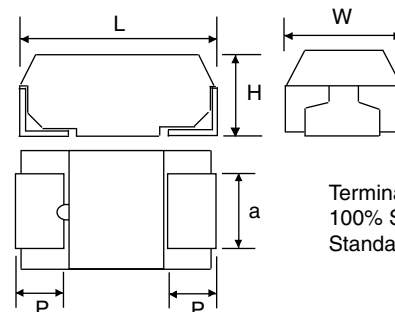
### DIMENSIONS (mm)

| Case Code | Metric Code | English Code | L             | W              | H             | P              | a             |
|-----------|-------------|--------------|---------------|----------------|---------------|----------------|---------------|
| J         | 1608        | 0603         | 1.6 $\pm$ 0.1 | 0.8 $\pm$ 0.1  | 0.8 $\pm$ 0.1 | 0.3 $\pm$ 0.15 | 0.6 $\pm$ 0.1 |
| P         | 2012        | 0805         | 2.0 $\pm$ 0.2 | 1.25 $\pm$ 0.2 | 1.2 MAX.      | 0.5 $\pm$ 0.2  | 0.9 $\pm$ 0.1 |
| A         | 3216        | 1206         | 3.2 $\pm$ 0.2 | 1.6 $\pm$ 0.2  | 1.6 $\pm$ 0.2 | 0.8 $\pm$ 0.3  | 1.2 $\pm$ 0.1 |
| A2        | 3216        | 1206         | 3.2 $\pm$ 0.2 | 1.6 $\pm$ 0.2  | 1.2 MAX.      | 0.8 $\pm$ 0.3  | 1.2 $\pm$ 0.1 |
| B         | 3528        | 1411         | 3.5 $\pm$ 0.2 | 2.8 $\pm$ 0.2  | 1.9 $\pm$ 0.2 | 0.8 $\pm$ 0.3  | 2.2 $\pm$ 0.1 |
| B2        | 3528        | 1411         | 3.5 $\pm$ 0.2 | 2.8 $\pm$ 0.2  | 1.2 MAX.      | 0.8 $\pm$ 0.3  | 2.3 $\pm$ 0.1 |
| C         | 6032        | 2412         | 6.0 $\pm$ 0.3 | 3.2 $\pm$ 0.3  | 2.6 $\pm$ 0.3 | 1.3 $\pm$ 0.3  | 2.2 $\pm$ 0.1 |
| D         | 7343        | 2916         | 7.3 $\pm$ 0.2 | 4.3 $\pm$ 0.2  | 2.9 $\pm$ 0.3 | 1.3 $\pm$ 0.3  | 2.4 $\pm$ 0.1 |
| E         | 7343H       | 2917         | 7.3 $\pm$ 0.2 | 4.3 $\pm$ 0.2  | 4.1 $\pm$ 0.2 | 1.3 $\pm$ 0.3  | 2.4 $\pm$ 0.1 |

#### J, P, A, A2, C, D & E CASE SIZE



#### B & B2 CASE SIZE



Terminations:  
100% Sn (Lead-Free)  
Standard

### CAPACITANCE CODES

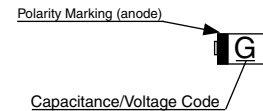
| Cap. (μF) | STD EIA Code | EIA Code 198D | Code for P Case Size | Code for J Case Size |      |        |       |       |
|-----------|--------------|---------------|----------------------|----------------------|------|--------|-------|-------|
|           |              |               |                      | 2.5Vdc               | 4Vdc | 6.3Vdc | 10Vdc | 16Vdc |
| 0.1       | 104          | A5            | -                    | -                    | -    | -      | -     | C     |
| 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                    | -                    | -    | -      | A     | -     |
| 2.2       | 225          | J6            | J                    | -                    | -    | Γ      | Λ     | -     |
| 3.3       | 335          | N6            | N                    | -                    | -    | ↵      | -     | -     |
| 4.7       | 475          | S6            | S                    | -                    | -    | J      | ∇     | -     |
| 6.8       | 685          | W6            | W                    | -                    | G    | ⌋      | -     | -     |
| 10        | 106          | A7            | Ā                    | e                    | ϖ    | Γ      | -     | -     |
| 22        | 226          | J7            | J̄                   | -                    | -    | -      | -     | -     |
| 33        | 336          | N7            | N̄                   | -                    | -    | -      | -     | -     |
| 47        | 476          | S7            | S̄                   | -                    | -    | -      | -     | -     |

### VOLTAGE CODES

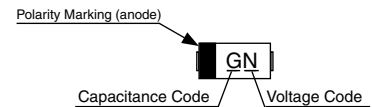
| Volts | Code |
|-------|------|
| 2.5   | e    |
| 4     | G    |
| 6.3   | J    |
| 10    | A    |
| 16    | C    |
| 20    | D    |
| 25    | E    |
| 35    | V    |
| 50    | H    |

### COMPONENT MARKING

#### J Case Size



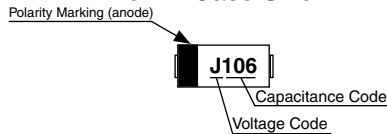
#### P Case Size



### PRODUCTION CODE

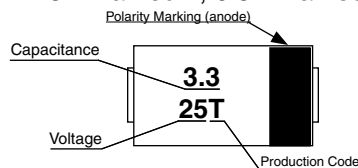
| Year | Month |     |     |     |     |     |     |     |      |     |     |     |
|------|-------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|
|      | Jan   | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec |
| 2004 | n     | p   | q   | r   | s   | t   | u   | v   | w    | x   | y   | z   |
| 2005 | A     | B   | C   | D   | E   | F   | G   | H   | J    | K   | L   | M   |
| 2006 | N     | P   | Q   | R   | S   | T   | U   | V   | W    | X   | Y   | Z   |
| 2007 | a     | b   | c   | d   | e   | f   | g   | h   | j    | k   | l   | m   |

#### A & A2 Case Size



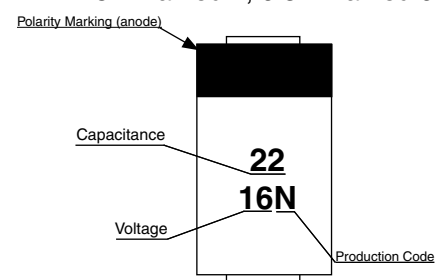
#### B, B2 & D1 Case Size

2.5V marked 2, 6.3V marked 6



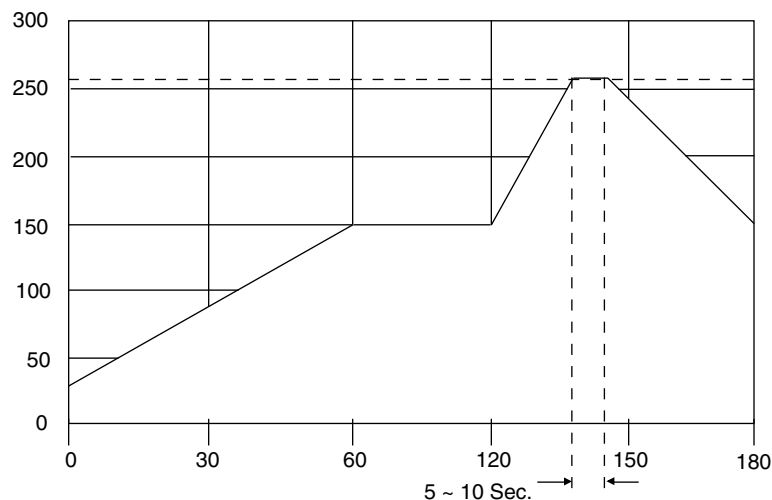
#### C & D Case Size

2.5V marked 2, 6.3V marked 6



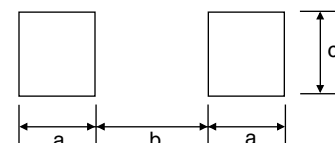
### Flow/Reflow Soldering

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



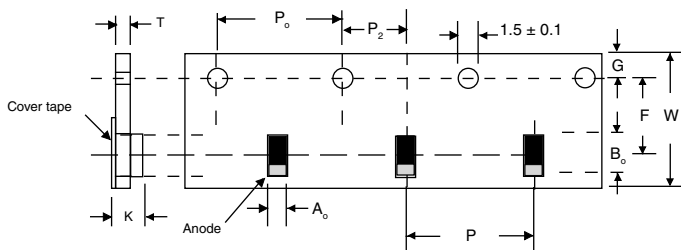
### RECOMMENDED LAND PATTERN DIMENSIONS (mm)

| Case Size | a    | b    | c    |
|-----------|------|------|------|
| J         | 0.90 | 0.70 | 1.00 |
| P         | 1.05 | 0.50 | 1.20 |
| A & A2    | 1.35 | 1.10 | 1.50 |
| B & B2    | 1.35 | 1.40 | 2.70 |
| C         | 2.00 | 2.90 | 2.70 |
| D         | 2.05 | 4.10 | 2.90 |



### TAPE DIMENSIONS (mm)

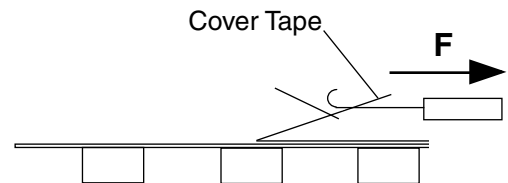
| Metric Code | Case Code | $A_0 \pm 0.2$ | $B_0 \pm 0.2$ | $W \pm 0.30$ | $F \pm 0.05$ | $P_0 \pm 0.1$ | $P_1 \pm 0.1$ | $P_2 \pm 0.05$ | $G \pm 0.1$ | $K \pm 0.2$ | T   | 7" Reel |
|-------------|-----------|---------------|---------------|--------------|--------------|---------------|---------------|----------------|-------------|-------------|-----|---------|
| 1608        | J         | 1.0           | 1.8           | 8.0          | 3.5          | 4.0           | 4.0           | 2.0            | 1.75        | 1.1         | 0.2 | 4000    |
| 2012        | P         | 1.4           | 2.2           | 8.0          | 3.5          | 4.0           | 4.0           | 2.0            | 1.75        | 1.4         | 0.2 | 3000    |
| 3216        | A2        | 1.9           | 3.5           | 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        | B2        | 3.2           | 3.8           | 8.0          | 3.5          | 4.0           | 4.0           | 2.0            | 1.75        | 1.4         | 0.2 | 3000    |
| 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        | 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       | W1             | W2       |
|------------|---------------|--------------|--------------|---------------|---------|----------------|----------|
| 8mm        | $178 \pm 2.0$ | $13 \pm 0.5$ | $21 \pm 0.5$ | $2.0 \pm 0.5$ | 50 min. | $10 \pm 2.0$   | 14.5 max |
| 12mm       | $178 \pm 2.0$ | $13 \pm 0.5$ | $21 \pm 0.5$ | $2.0 \pm 0.5$ | 50 min. | $14.5 \pm 2.0$ | 18.5 max |

