



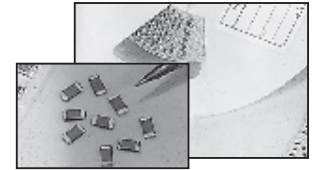
**FEATURES**

- CRACK RESISTANT TERMINATION
- SOFT TERMINATION, OPEN MODE FAILURE
- WIDE VOLTAGE RANGE (6.3V TO 5KV)
- HIGH CAPACITANCE (UP TO 10μF)
- RoHS COMPLIANT
- SAC SOLDER COMPATIBLE\*

**RoHS  
Compliant**

Includes all homogeneous materials

\*See Part Number System for Details



**SPECIFICATIONS**

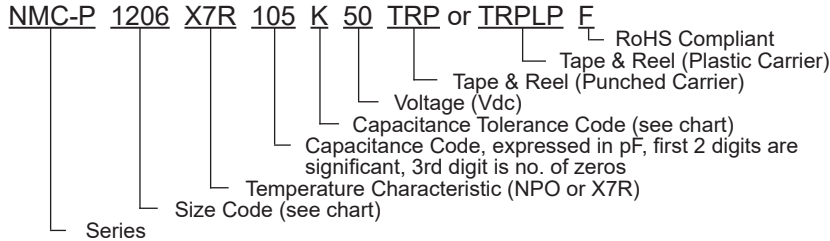
| Temperature Coefficient         | NPO  | X7R  | X5R                  |
|---------------------------------|--|--|----------------------|
| Capacitance Range               | 0.1pF ~ 0.22μF   | 100pF ~ 10μF   | 33,000pF ~ 10μF      |
| Capacitance Tolerance           | For 0.1pF ~ 10pF: ±0.1pF (B), ±0.25pF (C), ±0.5pF (D), ±1% (F)<br>**Above 10pF: ±1% (F), ±2% (G), ±5% (J), ±10% (K)  | ±10% (K)<br>±20% (M)   | ±10% (K)<br>±20% (M) |
| Operating Temperature Range     | -55°C ~ +125°C   |  | -55°C ~ +85°C        |
| Temperature Characteristics     | ±30ppm/°C  | ±15% Δ Cap.  | ±15% Δ Cap.          |
| Rated Voltages                  | 6.3Vdc ~ 5KVdc   | 6.3Vdc ~ 3KVdc   | 6.3Vdc ~ 25Vdc       |
| Q or Dissipation Factor         | Q = ≥ 1000 (more than 30pF)***<br>Q = ≥ 400 + 20 x C in pF (30pF and below)***   | Dissipation Factor<br>1KHz, 1.0V ± 0.2Vrms (See Values & Sizes Tables) |                      |
| Insulation Resistance           | NPO 10,000Megohm or<br>500Megohm/μF whichever is less @ +25°C  | See Tables on Pages 21 ~ 25  |                      |
| Dielectric Withstanding Voltage | 250% of rated voltage for 5 seconds, 50mA max. (6.3V ~ 100V)<br>200% of rated voltage for 5 seconds, 50mA max. (200V ~ 250V)<br>120% of rated voltage for 5 seconds, 50mA max. (400V ~ 450V)<br>150% of rated voltage for 5 seconds, 50mA max. (500V ~ 630V)<br>120% of rated voltage for 5 seconds, 50mA max. (1KV ~ 3KV)<br>110% of rated voltage for 5 seconds, 50mA max. (4KV) |  |                      |

\*Reflow soldering allowed for all case sizes. Contact NIC for wave soldering restrictions

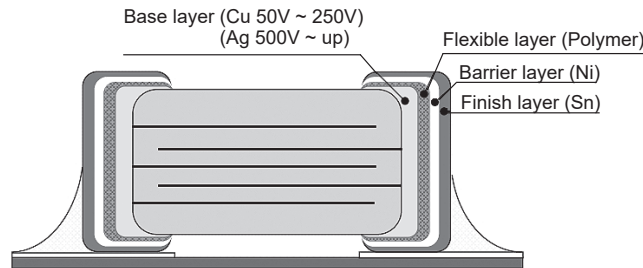
\*\*Contact NIC regarding available tolerances for NPO parts above 0.01μF

\*\*\*Test Frequency & Voltage: Up to 100pF 1MHz/1.0Vrms, Above 100pF 1KHz/1.0Vrms

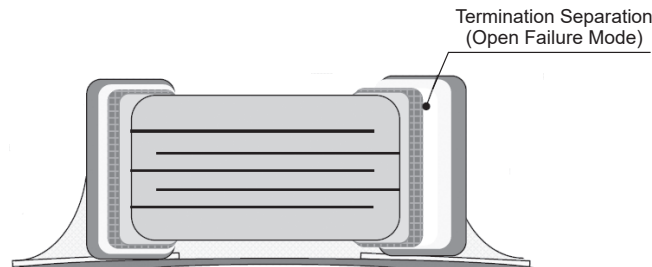
**PART NUMBER SYSTEM**



**CONSTRUCTION**



**OPEN MODE FAILURE AS A RESULT OF BENDING STRESS**



**NMC-P Series**  
**Surface Mount Multilayer Ceramic Capacitors**



**NPO VALUES AND SIZES (mm)**

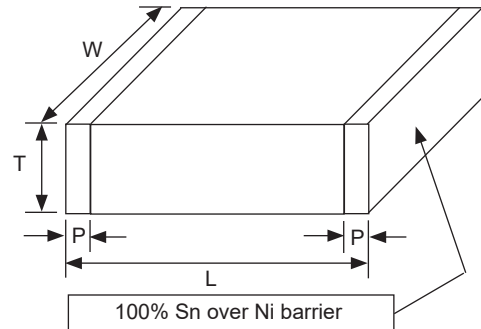
| EIA Case Size         | 0402                  |    |    |    |     | 0603       |    |    |    |     |     |     |
|-----------------------|-----------------------|----|----|----|-----|------------|----|----|----|-----|-----|-----|
| Length (L)            | 1.00 ± 0.2            |    |    |    |     | 1.60 ± 0.1 |    |    |    |     |     |     |
| Width (W)             | 0.50 ± 0.2            |    |    |    |     | 0.80 ± 0.1 |    |    |    |     |     |     |
| Thickness max. (T)    | 0.70 max.             |    |    |    |     | 1.10 max.  |    |    |    |     |     |     |
| Termination Width (P) | 0.15 min.             |    |    |    |     | 0.15 min.  |    |    |    |     |     |     |
| Capacitance           | Working Voltage (Vdc) |    |    |    |     |            |    |    |    |     |     |     |
|                       | 10                    | 16 | 25 | 50 | 100 | 10         | 16 | 25 | 50 | 100 | 200 | 250 |
| 0.1pF                 |                       |    |    |    |     |            |    |    |    |     |     |     |
| 0.2                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 0.3                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 0.4                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 0.5                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 1.0                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 1.2                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 1.5                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 1.8                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 2.0                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 2.2                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 2.7                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 3.0                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 3.3                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 3.9                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 4.0                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 4.7                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 5.0                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 5.6                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 6.0                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 6.8                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 7.0                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 8.0                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 8.2                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 9.0                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 10                    |                       |    |    |    |     |            |    |    |    |     |     |     |
| 12                    |                       |    |    |    |     |            |    |    |    |     |     |     |
| 15                    |                       |    |    |    |     |            |    |    |    |     |     |     |
| 18                    |                       |    |    |    |     |            |    |    |    |     |     |     |
| 22                    |                       |    |    |    |     |            |    |    |    |     |     |     |
| 27                    |                       |    |    |    |     |            |    |    |    |     |     |     |
| 33                    |                       |    |    |    |     |            |    |    |    |     |     |     |
| 39                    |                       |    |    |    |     |            |    |    |    |     |     |     |
| 47                    |                       |    |    |    |     |            |    |    |    |     |     |     |
| 56                    |                       |    |    |    |     |            |    |    |    |     |     |     |
| 68                    |                       |    |    |    |     |            |    |    |    |     |     |     |
| 82                    |                       |    |    |    |     |            |    |    |    |     |     |     |
| 100                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 120                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 150                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 180                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 220                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 270                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 330                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 390                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 470                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 560                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 680                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 820                   |                       |    |    |    |     |            |    |    |    |     |     |     |
| 1000                  |                       |    |    |    |     |            |    |    |    |     |     |     |
| 1200                  |                       |    |    |    |     |            |    |    |    |     |     |     |
| 1500                  |                       |    |    |    |     |            |    |    |    |     |     |     |
| 1800                  |                       |    |    |    |     |            |    |    |    |     |     |     |
| 2200                  |                       |    |    |    |     |            |    |    |    |     |     |     |
| 2700                  |                       |    |    |    |     |            |    |    |    |     |     |     |
| 3300                  |                       |    |    |    |     |            |    |    |    |     |     |     |

**NMC-P Series**  
**Surface Mount Multilayer Ceramic Capacitors**



**NPO VALUES AND SIZES (mm)**

| EIA Case Size         | 0805       |    |    |    |     |     |     |     |     |     |
|-----------------------|------------|----|----|----|-----|-----|-----|-----|-----|-----|
| Length (L)            | 2.00 ± 0.3 |    |    |    |     |     |     |     |     |     |
| Width (W)             | 1.25 ± 0.3 |    |    |    |     |     |     |     |     |     |
| Thickness max. (T)    | 1.55 max.  |    |    |    |     |     |     |     |     |     |
| Termination Width (P) | 0.30 min.  |    |    |    |     |     |     |     |     |     |
| Capacitance           | 10         | 16 | 25 | 50 | 100 | 200 | 250 | 500 | 630 | 1KV |
| 0.5pF                 |            |    |    |    |     |     |     |     |     |     |
| 1.0                   |            |    |    |    |     |     |     |     |     |     |
| 1.2                   |            |    |    |    |     |     |     |     |     |     |
| 1.5                   |            |    |    |    |     |     |     |     |     |     |
| 1.8                   |            |    |    |    |     |     |     |     |     |     |
| 2.0                   |            |    |    |    |     |     |     |     |     |     |
| 2.2                   |            |    |    |    |     |     |     |     |     |     |
| 2.7                   |            |    |    |    |     |     |     |     |     |     |
| 3.0                   |            |    |    |    |     |     |     |     |     |     |
| 3.3                   |            |    |    |    |     |     |     |     |     |     |
| 3.9                   |            |    |    |    |     |     |     |     |     |     |
| 4.0                   |            |    |    |    |     |     |     |     |     |     |
| 4.7                   |            |    |    |    |     |     |     |     |     |     |
| 5.0                   |            |    |    |    |     |     |     |     |     |     |
| 5.6                   |            |    |    |    |     |     |     |     |     |     |
| 6.0                   |            |    |    |    |     |     |     |     |     |     |
| 6.8                   |            |    |    |    |     |     |     |     |     |     |
| 7.0                   |            |    |    |    |     |     |     |     |     |     |
| 8.0                   |            |    |    |    |     |     |     |     |     |     |
| 8.2                   |            |    |    |    |     |     |     |     |     |     |
| 9.0                   |            |    |    |    |     |     |     |     |     |     |
| 10                    |            |    |    |    |     |     |     |     |     |     |
| 12                    |            |    |    |    |     |     |     |     |     |     |
| 15                    |            |    |    |    |     |     |     |     |     |     |
| 18                    |            |    |    |    |     |     |     |     |     |     |
| 22                    |            |    |    |    |     |     |     |     |     |     |
| 27                    |            |    |    |    |     |     |     |     |     |     |
| 33                    |            |    |    |    |     |     |     |     |     |     |
| 39                    |            |    |    |    |     |     |     |     |     |     |
| 47                    |            |    |    |    |     |     |     |     |     |     |
| 56                    |            |    |    |    |     |     |     |     |     |     |
| 68                    |            |    |    |    |     |     |     |     |     |     |
| 82                    |            |    |    |    |     |     |     |     |     |     |
| 100                   |            |    |    |    |     |     |     |     |     |     |
| 120                   |            |    |    |    |     |     |     |     |     |     |
| 150                   |            |    |    |    |     |     |     |     |     |     |
| 180                   |            |    |    |    |     |     |     |     |     |     |
| 220                   |            |    |    |    |     |     |     |     |     |     |
| 270                   |            |    |    |    |     |     |     |     |     |     |
| 330                   |            |    |    |    |     |     |     |     |     |     |
| 390                   |            |    |    |    |     |     |     |     |     |     |
| 470                   |            |    |    |    |     |     |     |     |     |     |
| 560                   |            |    |    |    |     |     |     |     |     |     |
| 680                   |            |    |    |    |     |     |     |     |     |     |
| 820                   |            |    |    |    |     |     |     |     |     |     |
| 1000                  |            |    |    |    |     |     |     |     |     |     |
| 1200                  |            |    |    |    |     |     |     |     |     |     |
| 1500                  |            |    |    |    |     |     |     |     |     |     |
| 1800                  |            |    |    |    |     |     |     |     |     |     |
| 2200                  |            |    |    |    |     |     |     |     |     |     |
| 2700                  |            |    |    |    |     |     |     |     |     |     |
| 3300                  |            |    |    |    |     |     |     |     |     |     |
| 3900                  |            |    |    |    |     |     |     |     |     |     |
| 4700                  |            |    |    |    |     |     |     |     |     |     |
| 5600                  |            |    |    |    |     |     |     |     |     |     |
| 6800                  |            |    |    |    |     |     |     |     |     |     |
| 8200                  |            |    |    |    |     |     |     |     |     |     |
| 10000                 |            |    |    |    |     |     |     |     |     |     |



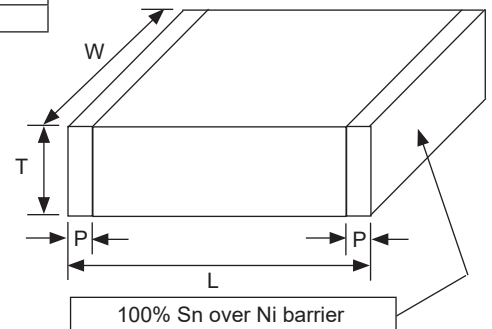
# NMC-P Series

## Surface Mount Multilayer Ceramic Capacitors



### NPO VALUES AND SIZES (mm)

| EIA Case Size         | 1206                  |    |    |    |     |     |     |     |     |     |       |     |     |
|-----------------------|-----------------------|----|----|----|-----|-----|-----|-----|-----|-----|-------|-----|-----|
| Length (L)            | 3.20 ± 0.5            |    |    |    |     |     |     |     |     |     |       |     |     |
| Width (W)             | 1.60 ± 0.5            |    |    |    |     |     |     |     |     |     |       |     |     |
| Thickness max. (T)    | 3.10 max.             |    |    |    |     |     |     |     |     |     |       |     |     |
| Termination Width (P) | 0.25 min.             |    |    |    |     |     |     |     |     |     |       |     |     |
| Capacitance           | Working Voltage (Vdc) |    |    |    |     |     |     |     |     |     |       |     |     |
|                       | 10                    | 16 | 25 | 50 | 100 | 200 | 250 | 500 | 630 | 1KV | 1.5KV | 2KV | 3KV |
| 1.2pF                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 1.5 ~ 4.7             |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 5.0                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 12                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 15                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 18                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 22                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 27                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 33                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 39                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 47                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 56                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 68                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 82                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 100                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 120                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 150                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 180                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 220                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 270                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 330                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 390                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 470                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 560                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 680                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 820                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 1000                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 1200                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 1500                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 1800                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 2200                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 2700                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 3300                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 3900                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 4700                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 5600                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 6800                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 8200                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 10000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 12000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 15000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 18000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 22000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 27000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 33000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 39000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |

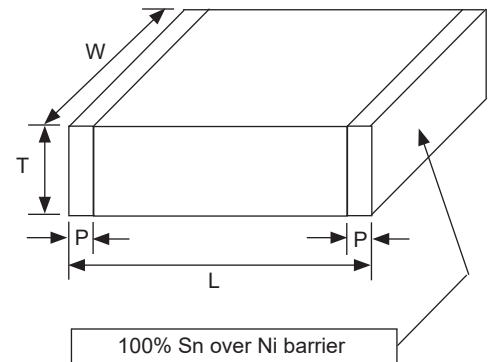


**NMC-P Series**  
Surface Mount Multilayer Ceramic Capacitors



**NPO VALUES AND SIZES (mm)**

| EIA Case Size         | 1210                  |    |    |    |     |     |     |     |     |     |       |     |
|-----------------------|-----------------------|----|----|----|-----|-----|-----|-----|-----|-----|-------|-----|
| Length (L)            | 3.20 ± 0.6            |    |    |    |     |     |     |     |     |     |       |     |
| Width (W)             | 2.50 ± 0.5            |    |    |    |     |     |     |     |     |     |       |     |
| Thickness max. (T)    | 3.00 max.             |    |    |    |     |     |     |     |     |     |       |     |
| Termination Width (P) | 0.50 min.             |    |    |    |     |     |     |     |     |     |       |     |
| Capacitance           | Working Voltage (Vdc) |    |    |    |     |     |     |     |     |     |       |     |
|                       | 10                    | 16 | 25 | 50 | 100 | 200 | 250 | 500 | 630 | 1KV | 1.5KV | 2KV |
| 10pF                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 12                    |                       |    |    |    |     |     |     |     |     |     |       |     |
| 15                    |                       |    |    |    |     |     |     |     |     |     |       |     |
| 18                    |                       |    |    |    |     |     |     |     |     |     |       |     |
| 22                    |                       |    |    |    |     |     |     |     |     |     |       |     |
| 27                    |                       |    |    |    |     |     |     |     |     |     |       |     |
| 33                    |                       |    |    |    |     |     |     |     |     |     |       |     |
| 39                    |                       |    |    |    |     |     |     |     |     |     |       |     |
| 47                    |                       |    |    |    |     |     |     |     |     |     |       |     |
| 56                    |                       |    |    |    |     |     |     |     |     |     |       |     |
| 68                    |                       |    |    |    |     |     |     |     |     |     |       |     |
| 82                    |                       |    |    |    |     |     |     |     |     |     |       |     |
| 100                   |                       |    |    |    |     |     |     |     |     |     |       |     |
| 120                   |                       |    |    |    |     |     |     |     |     |     |       |     |
| 150                   |                       |    |    |    |     |     |     |     |     |     |       |     |
| 180                   |                       |    |    |    |     |     |     |     |     |     |       |     |
| 220                   |                       |    |    |    |     |     |     |     |     |     |       |     |
| 270                   |                       |    |    |    |     |     |     |     |     |     |       |     |
| 330                   |                       |    |    |    |     |     |     |     |     |     |       |     |
| 390                   |                       |    |    |    |     |     |     |     |     |     |       |     |
| 470                   |                       |    |    |    |     |     |     |     |     |     |       |     |
| 560                   |                       |    |    |    |     |     |     |     |     |     |       |     |
| 680                   |                       |    |    |    |     |     |     |     |     |     |       |     |
| 820                   |                       |    |    |    |     |     |     |     |     |     |       |     |
| 1000                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 1200                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 1500                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 1800                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 2200                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 2700                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 3300                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 3900                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 4700                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 5600                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 6800                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 8200                  |                       |    |    |    |     |     |     |     |     |     |       |     |
| 10000                 |                       |    |    |    |     |     |     |     |     |     |       |     |
| 12000                 |                       |    |    |    |     |     |     |     |     |     |       |     |
| 15000                 |                       |    |    |    |     |     |     |     |     |     |       |     |
| 18000                 |                       |    |    |    |     |     |     |     |     |     |       |     |
| 22000                 |                       |    |    |    |     |     |     |     |     |     |       |     |
| 27000                 |                       |    |    |    |     |     |     |     |     |     |       |     |
| 33000                 |                       |    |    |    |     |     |     |     |     |     |       |     |
| 39000                 |                       |    |    |    |     |     |     |     |     |     |       |     |
| 47000                 |                       |    |    |    |     |     |     |     |     |     |       |     |
| 56000                 |                       |    |    |    |     |     |     |     |     |     |       |     |
| 68000                 |                       |    |    |    |     |     |     |     |     |     |       |     |
| 100000                |                       |    |    |    |     |     |     |     |     |     |       |     |



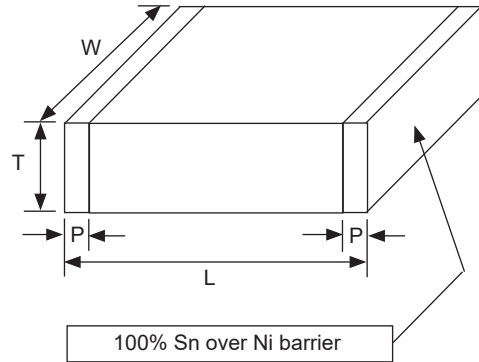
# NMC-P Series

## Surface Mount Multilayer Ceramic Capacitors



### NPO VALUES AND SIZES (mm)

| EIA Case Size         | 1808                  |     |     |       |     |     |    |
|-----------------------|-----------------------|-----|-----|-------|-----|-----|----|
| Length (L)            | 4.50 +0.6/-0.4        |     |     |       |     |     |    |
| Width (W)             | 3.20 ± 0.4            |     |     |       |     |     |    |
| Thickness max. (T)    | 2.20 max.             |     |     |       |     |     |    |
| Termination Width (P) | 0.25 min.             |     |     |       |     |     |    |
| Capacitance           | Working Voltage (Vdc) |     |     |       |     |     |    |
|                       | 500                   | 630 | 1KV | 1.5KV | 2KV | 3KV | 5K |
| 2.2                   |                       |     |     |       |     |     |    |
| 2.7                   |                       |     |     |       |     |     |    |
| 3.0                   |                       |     |     |       |     |     |    |
| 3.3                   |                       |     |     |       |     |     |    |
| 3.9                   |                       |     |     |       |     |     |    |
| 4.0                   |                       |     |     |       |     |     |    |
| 4.7                   |                       |     |     |       |     |     |    |
| 5.0                   |                       |     |     |       |     |     |    |
| 5.6                   |                       |     |     |       |     |     |    |
| 6.0                   |                       |     |     |       |     |     |    |
| 6.8                   |                       |     |     |       |     |     |    |
| 7.0                   |                       |     |     |       |     |     |    |
| 8.0                   |                       |     |     |       |     |     |    |
| 8.2                   |                       |     |     |       |     |     |    |
| 9.0                   |                       |     |     |       |     |     |    |
| 10                    |                       |     |     |       |     |     |    |
| 12                    |                       |     |     |       |     |     |    |
| 15                    |                       |     |     |       |     |     |    |
| 18                    |                       |     |     |       |     |     |    |
| 22                    |                       |     |     |       |     |     |    |
| 27                    |                       |     |     |       |     |     |    |
| 33                    |                       |     |     |       |     |     |    |
| 39                    |                       |     |     |       |     |     |    |
| 47                    |                       |     |     |       |     |     |    |
| 56                    |                       |     |     |       |     |     |    |
| 68                    |                       |     |     |       |     |     |    |
| 82                    |                       |     |     |       |     |     |    |
| 100                   |                       |     |     |       |     |     |    |
| 120                   |                       |     |     |       |     |     |    |
| 150                   |                       |     |     |       |     |     |    |
| 180                   |                       |     |     |       |     |     |    |
| 220                   |                       |     |     |       |     |     |    |
| 270                   |                       |     |     |       |     |     |    |
| 330                   |                       |     |     |       |     |     |    |
| 390                   |                       |     |     |       |     |     |    |
| 470                   |                       |     |     |       |     |     |    |
| 560                   |                       |     |     |       |     |     |    |
| 680                   |                       |     |     |       |     |     |    |
| 820                   |                       |     |     |       |     |     |    |
| 1000                  |                       |     |     |       |     |     |    |
| 1200                  |                       |     |     |       |     |     |    |
| 1500                  |                       |     |     |       |     |     |    |
| 1800                  |                       |     |     |       |     |     |    |
| 2200                  |                       |     |     |       |     |     |    |
| 2700                  |                       |     |     |       |     |     |    |
| 3300                  |                       |     |     |       |     |     |    |

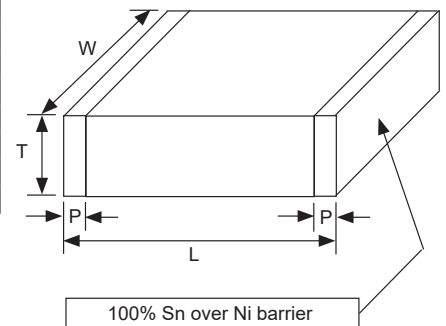


**NMC-P Series**  
Surface Mount Multilayer Ceramic Capacitors



**NPO VALUES AND SIZES (mm)**

| EIA Case Size         | 1812                  |    |    |    |     |     |     |     |     |     |       |     |     |
|-----------------------|-----------------------|----|----|----|-----|-----|-----|-----|-----|-----|-------|-----|-----|
| Length (L)            | 4.5 +0.6/-0.4         |    |    |    |     |     |     |     |     |     |       |     |     |
| Width (W)             | 3.20 ± 0.4            |    |    |    |     |     |     |     |     |     |       |     |     |
| Thickness max. (T)    | 3.00 max.             |    |    |    |     |     |     |     |     |     |       |     |     |
| Termination Width (P) | 0.25 min.             |    |    |    |     |     |     |     |     |     |       |     |     |
| Capacitance           | Working Voltage (Vdc) |    |    |    |     |     |     |     |     |     |       |     |     |
|                       | 10                    | 16 | 25 | 50 | 100 | 200 | 250 | 500 | 630 | 1KV | 1.5KV | 2KV | 3KV |
| 10pF                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 12                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 15                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 18                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 22                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 27                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 33                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 39                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 47                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 56                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 68                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 82                    |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 100                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 120                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 150                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 180                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 220                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 270                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 330                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 390                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 470                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 560                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 680                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 820                   |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 1000                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 1200                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 1500                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 1800                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 2200                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 2700                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 3300                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 3900                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 4700                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 5600                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 6800                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 8200                  |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 10000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 12000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 15000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 18000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 22000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 27000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 33000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 39000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 47000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 56000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 68000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 82000                 |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 100000                |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 120000                |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 150000                |                       |    |    |    |     |     |     |     |     |     |       |     |     |
| 220000                |                       |    |    |    |     |     |     |     |     |     |       |     |     |



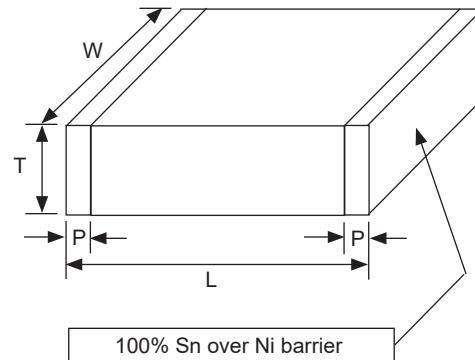
# NMC-P Series

## Surface Mount Multilayer Ceramic Capacitors



### NPO VALUES AND SIZES (mm)

| EIA Case Size         | 1825                  |     |     |     |     |     |     |     |
|-----------------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|
| Length (L)            | 4.5 +0.6/-0.4         |     |     |     |     |     |     |     |
| Width (W)             | 6.30 ± 0.4            |     |     |     |     |     |     |     |
| Thickness max. (T)    | 3.10 max.             |     |     |     |     |     |     |     |
| Termination Width (P) | 0.40 min.             |     |     |     |     |     |     |     |
| Capacitance           | Working Voltage (Vdc) |     |     |     |     |     |     |     |
|                       | 100                   | 200 | 250 | 500 | 630 | 1KV | 2KV | 3KV |
| 10pF                  |                       |     |     |     |     |     |     |     |
| 12                    |                       |     |     |     |     |     |     |     |
| 15                    |                       |     |     |     |     |     |     |     |
| 18                    |                       |     |     |     |     |     |     |     |
| 22                    |                       |     |     |     |     |     |     |     |
| 27                    |                       |     |     |     |     |     |     |     |
| 33                    |                       |     |     |     |     |     |     |     |
| 39                    |                       |     |     |     |     |     |     |     |
| 47                    |                       |     |     |     |     |     |     |     |
| 56                    |                       |     |     |     |     |     |     |     |
| 68                    |                       |     |     |     |     |     |     |     |
| 82                    |                       |     |     |     |     |     |     |     |
| 100                   |                       |     |     |     |     |     |     |     |
| 120                   |                       |     |     |     |     |     |     |     |
| 150                   |                       |     |     |     |     |     |     |     |
| 180                   |                       |     |     |     |     |     |     |     |
| 220                   |                       |     |     |     |     |     |     |     |
| 270                   |                       |     |     |     |     |     |     |     |
| 330                   |                       |     |     |     |     |     |     |     |
| 390                   |                       |     |     |     |     |     |     |     |
| 470                   |                       |     |     |     |     |     |     |     |
| 560                   |                       |     |     |     |     |     |     |     |
| 680                   |                       |     |     |     |     |     |     |     |
| 820                   |                       |     |     |     |     |     |     |     |
| 1000                  |                       |     |     |     |     |     |     |     |
| 1200                  |                       |     |     |     |     |     |     |     |
| 1500                  |                       |     |     |     |     |     |     |     |
| 1800                  |                       |     |     |     |     |     |     |     |
| 2200                  |                       |     |     |     |     |     |     |     |
| 2700                  |                       |     |     |     |     |     |     |     |
| 3300                  |                       |     |     |     |     |     |     |     |
| 3900                  |                       |     |     |     |     |     |     |     |
| 4700                  |                       |     |     |     |     |     |     |     |
| 5600                  |                       |     |     |     |     |     |     |     |
| 6800                  |                       |     |     |     |     |     |     |     |
| 8200                  |                       |     |     |     |     |     |     |     |
| 10000                 |                       |     |     |     |     |     |     |     |
| 12000                 |                       |     |     |     |     |     |     |     |
| 15000                 |                       |     |     |     |     |     |     |     |
| 18000                 |                       |     |     |     |     |     |     |     |
| 22000                 |                       |     |     |     |     |     |     |     |
| 27000                 |                       |     |     |     |     |     |     |     |
| 33000                 |                       |     |     |     |     |     |     |     |
| 39000                 |                       |     |     |     |     |     |     |     |
| 47000                 |                       |     |     |     |     |     |     |     |
| 56000                 |                       |     |     |     |     |     |     |     |
| 68000                 |                       |     |     |     |     |     |     |     |
| 82000                 |                       |     |     |     |     |     |     |     |
| 100000                |                       |     |     |     |     |     |     |     |
| 0.1µF                 |                       |     |     |     |     |     |     |     |





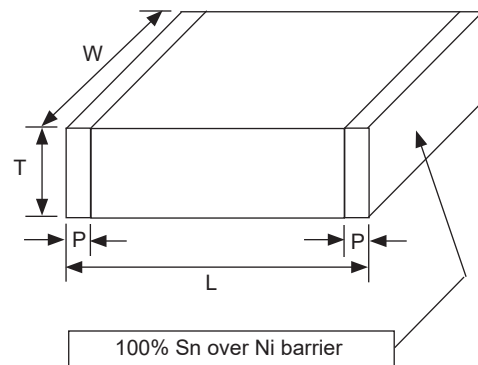
# NMC-P Series

## Surface Mount Multilayer Ceramic Capacitors



### NPO VALUES AND SIZES (mm)

| EIA Case Size         | 2220                  |     |     |     |     |     |     |     |     |
|-----------------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Length (L)            | 5.70 ± 0.5            |     |     |     |     |     |     |     |     |
| Width (W)             | 5.00 ± 0.4            |     |     |     |     |     |     |     |     |
| Thickness max. (T)    | 3.10 max.             |     |     |     |     |     |     |     |     |
| Termination Width (P) | 0.50 min.             |     |     |     |     |     |     |     |     |
| Capacitance           | Working Voltage (Vdc) |     |     |     |     |     |     |     |     |
|                       | 100                   | 200 | 250 | 500 | 630 | 1KV | 2KV | 3KV | 5KV |
| 8.2pF                 |                       |     |     |     |     |     |     |     |     |
| 10                    |                       |     |     |     |     |     |     |     |     |
| 12                    |                       |     |     |     |     |     |     |     |     |
| 15                    |                       |     |     |     |     |     |     |     |     |
| 18                    |                       |     |     |     |     |     |     |     |     |
| 22                    |                       |     |     |     |     |     |     |     |     |
| 27                    |                       |     |     |     |     |     |     |     |     |
| 33                    |                       |     |     |     |     |     |     |     |     |
| 39                    |                       |     |     |     |     |     |     |     |     |
| 47                    |                       |     |     |     |     |     |     |     |     |
| 56                    |                       |     |     |     |     |     |     |     |     |
| 68                    |                       |     |     |     |     |     |     |     |     |
| 82                    |                       |     |     |     |     |     |     |     |     |
| 100                   |                       |     |     |     |     |     |     |     |     |
| 120                   |                       |     |     |     |     |     |     |     |     |
| 150                   |                       |     |     |     |     |     |     |     |     |
| 180                   |                       |     |     |     |     |     |     |     |     |
| 220                   |                       |     |     |     |     |     |     |     |     |
| 270                   |                       |     |     |     |     |     |     |     |     |
| 330                   |                       |     |     |     |     |     |     |     |     |
| 390                   |                       |     |     |     |     |     |     |     |     |
| 470                   |                       |     |     |     |     |     |     |     |     |
| 560                   |                       |     |     |     |     |     |     |     |     |
| 680                   |                       |     |     |     |     |     |     |     |     |
| 820                   |                       |     |     |     |     |     |     |     |     |
| 1000                  |                       |     |     |     |     |     |     |     |     |
| 1200                  |                       |     |     |     |     |     |     |     |     |
| 1500                  |                       |     |     |     |     |     |     |     |     |
| 1800                  |                       |     |     |     |     |     |     |     |     |
| 2200                  |                       |     |     |     |     |     |     |     |     |
| 2700                  |                       |     |     |     |     |     |     |     |     |
| 3300                  |                       |     |     |     |     |     |     |     |     |
| 3900                  |                       |     |     |     |     |     |     |     |     |
| 4700                  |                       |     |     |     |     |     |     |     |     |
| 5600                  |                       |     |     |     |     |     |     |     |     |
| 6800                  |                       |     |     |     |     |     |     |     |     |
| 8200                  |                       |     |     |     |     |     |     |     |     |
| 10000                 |                       |     |     |     |     |     |     |     |     |
| 12000                 |                       |     |     |     |     |     |     |     |     |
| 15000                 |                       |     |     |     |     |     |     |     |     |
| 18000                 |                       |     |     |     |     |     |     |     |     |
| 22000                 |                       |     |     |     |     |     |     |     |     |
| 27000                 |                       |     |     |     |     |     |     |     |     |
| 33000                 |                       |     |     |     |     |     |     |     |     |
| 39000                 |                       |     |     |     |     |     |     |     |     |
| 47000                 |                       |     |     |     |     |     |     |     |     |
| 68000                 |                       |     |     |     |     |     |     |     |     |
| 82000                 |                       |     |     |     |     |     |     |     |     |
| 0.1µF                 |                       |     |     |     |     |     |     |     |     |



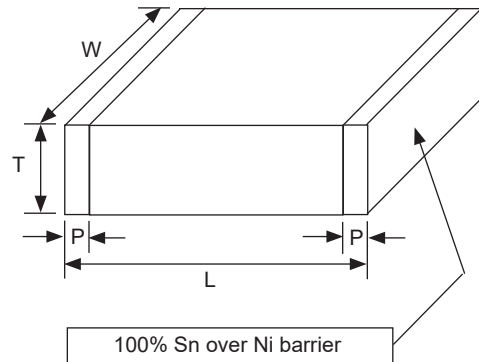
# NMC-P Series

## Surface Mount Multilayer Ceramic Capacitors



### NPO VALUES AND SIZES (mm)

| EIA Case Size         | 2225                  |     |     |     |     |     |     |     |
|-----------------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|
| Length (L)            | 5.70 ± 0.5            |     |     |     |     |     |     |     |
| Width (W)             | 6.30 ± 0.4            |     |     |     |     |     |     |     |
| Thickness max. (T)    | 3.10 max.             |     |     |     |     |     |     |     |
| Termination Width (P) | 0.50 min.             |     |     |     |     |     |     |     |
| Capacitance           | Working Voltage (Vdc) |     |     |     |     |     |     |     |
|                       | 100                   | 200 | 250 | 500 | 630 | 1KV | 2KV | 3KV |
| 10pF                  |                       |     |     |     |     |     |     |     |
| 12                    |                       |     |     |     |     |     |     |     |
| 15                    |                       |     |     |     |     |     |     |     |
| 18                    |                       |     |     |     |     |     |     |     |
| 22                    |                       |     |     |     |     |     |     |     |
| 27                    |                       |     |     |     |     |     |     |     |
| 33                    |                       |     |     |     |     |     |     |     |
| 39                    |                       |     |     |     |     |     |     |     |
| 47                    |                       |     |     |     |     |     |     |     |
| 56                    |                       |     |     |     |     |     |     |     |
| 68                    |                       |     |     |     |     |     |     |     |
| 82                    |                       |     |     |     |     |     |     |     |
| 100                   |                       |     |     |     |     |     |     |     |
| 120                   |                       |     |     |     |     |     |     |     |
| 150                   |                       |     |     |     |     |     |     |     |
| 180                   |                       |     |     |     |     |     |     |     |
| 220                   |                       |     |     |     |     |     |     |     |
| 270                   |                       |     |     |     |     |     |     |     |
| 330                   |                       |     |     |     |     |     |     |     |
| 390                   |                       |     |     |     |     |     |     |     |
| 470                   |                       |     |     |     |     |     |     |     |
| 560                   |                       |     |     |     |     |     |     |     |
| 680                   |                       |     |     |     |     |     |     |     |
| 820                   |                       |     |     |     |     |     |     |     |
| 1000                  |                       |     |     |     |     |     |     |     |
| 1200                  |                       |     |     |     |     |     |     |     |
| 1500                  |                       |     |     |     |     |     |     |     |
| 1800                  |                       |     |     |     |     |     |     |     |
| 2200                  |                       |     |     |     |     |     |     |     |
| 2700                  |                       |     |     |     |     |     |     |     |
| 3300                  |                       |     |     |     |     |     |     |     |
| 3900                  |                       |     |     |     |     |     |     |     |
| 4700                  |                       |     |     |     |     |     |     |     |
| 5600                  |                       |     |     |     |     |     |     |     |
| 6800                  |                       |     |     |     |     |     |     |     |
| 8200                  |                       |     |     |     |     |     |     |     |
| 10000                 |                       |     |     |     |     |     |     |     |
| 12000                 |                       |     |     |     |     |     |     |     |
| 15000                 |                       |     |     |     |     |     |     |     |
| 18000                 |                       |     |     |     |     |     |     |     |
| 22000                 |                       |     |     |     |     |     |     |     |
| 27000                 |                       |     |     |     |     |     |     |     |
| 33000                 |                       |     |     |     |     |     |     |     |
| 39000                 |                       |     |     |     |     |     |     |     |
| 47000                 |                       |     |     |     |     |     |     |     |
| 68000                 |                       |     |     |     |     |     |     |     |
| 82000                 |                       |     |     |     |     |     |     |     |
| 0.1µF                 |                       |     |     |     |     |     |     |     |



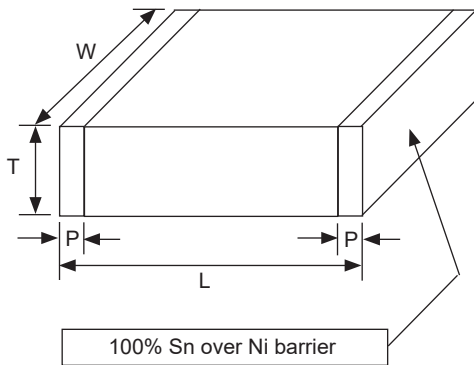


**X7R VALUES AND SIZES (mm)**

| EIA Case Size         | 0402                  |      |      |      |      |
|-----------------------|-----------------------|------|------|------|------|
| Length (L)            | 1.00 ± 0.2            |      |      |      |      |
| Width (W)             | 0.50 ± 0.1            |      |      |      |      |
| Thickness max. (T)    | 0.70 max.             |      |      |      |      |
| Termination Width (P) | 0.15 min.             |      |      |      |      |
| Capacitance           | Working Voltage (Vdc) |      |      |      |      |
|                       | 10                    | 16   | 25   | 50   | 100  |
| 100pF                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 120                   | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 150                   | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 180                   | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 220                   | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 270                   | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 330                   | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 390                   | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 470                   | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 560                   | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 680                   | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 820                   | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 1000                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 1200                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 1500                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 1800                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 2200                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 2700                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 3300                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 3900                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 4700                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |
| 5600                  | 5%                    | 3.5% | 3.5% | 2.5% |      |
| 6800                  | 5%                    | 3.5% | 3.5% | 2.5% |      |
| 8200                  | 5%                    | 3.5% | 3.5% | 2.5% |      |
| 10000                 | 5%                    | 3.5% | 3.5% | 2.5% |      |
| 12000                 | 5%                    | 3.5% | 3.5% |      |      |
| 15000                 | 5%                    | 3.5% | 3.5% |      |      |
| 18000                 | 5%                    | 3.5% | 3.5% |      |      |
| 22000                 | 5%                    | 3.5% | 3.5% |      |      |
| 27000                 | 5%                    | 3.5% | 3.5% |      |      |
| 33000                 | 5%                    | 5%   | 3.5% |      |      |
| 39000                 | 5%                    | 5%   | 3.5% |      |      |
| 47000                 | 5%                    | 5%   | 3.5% |      |      |
| 56000                 | 5%                    | 5%   |      |      |      |
| 68000                 | 5%                    | 5%   |      |      |      |
| 82000                 | 5%                    | 5%   |      |      |      |
| 0.1µF                 | 5%                    | 5%   |      |      |      |

| EIA Case Size         | 0603                  |       |       |       |       |     |     |  |
|-----------------------|-----------------------|-------|-------|-------|-------|-----|-----|--|
| Length (L)            | 1.60 ± 0.3            |       |       |       |       |     |     |  |
| Width (W)             | 0.80 ± 0.3            |       |       |       |       |     |     |  |
| Thickness max. (T)    | 1.10 max.             |       |       |       |       |     |     |  |
| Termination Width (P) | 0.25 min.             |       |       |       |       |     |     |  |
| Capacitance           | Working Voltage (Vdc) |       |       |       |       |     |     |  |
|                       | 10                    | 16    | 25    | 50    | 100   | 200 | 250 |  |
| 100pF                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 120                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 150                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 180                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 220                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 270                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 330                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 390                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 470                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 560                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 680                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 820                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 1000                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 1200                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 1500                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 1800                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 2200                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 2700                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 3300                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 3900                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 4700                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 5600                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 6800                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 8200                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 10000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 5%  | 5%  |  |
| 12000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% |     |     |  |
| 15000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% |     |     |  |
| 18000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% |     |     |  |
| 22000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% |     |     |  |
| 27000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% |     |     |  |
| 33000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% |     |     |  |
| 39000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% |     |     |  |
| 47000                 | 5%                    | 3.50% | 3.50% | 3%    | 2.50% |     |     |  |
| 56000                 | 5%                    | 3.50% | 3.50% | 3%    | 2.50% |     |     |  |
| 68000                 | 5%                    | 3.50% | 3.50% | 3%    | 5%    |     |     |  |
| 82000                 | 5%                    | 3.50% | 3.50% | 3%    | 5%    |     |     |  |
| 0.1µF                 | 5%                    | 3.50% | 3.50% | 10%   | 5%    |     |     |  |
| 0.12                  | 5%                    | 3.50% | 3.50% |       |       |     |     |  |
| 0.15                  | 5%                    | 5%    | 3.50% |       |       |     |     |  |
| 0.18                  | 5%                    | 5%    | 3.50% |       |       |     |     |  |
| 0.22                  | 5%                    | 5%    | 3.50% | 10%   |       |     |     |  |
| 0.27                  | 5%                    | 5%    | 3.50% |       |       |     |     |  |
| 0.33                  | 10%                   | 5%    | 7%    |       |       |     |     |  |
| 0.39                  | 10%                   | 5%    | 7%    |       |       |     |     |  |
| 0.47                  | 10%                   | 5%    | 10%   |       |       |     |     |  |
| 0.56                  | 10%                   | 5%    |       |       |       |     |     |  |
| 0.68                  | 10%                   | 10%   |       |       |       |     |     |  |
| 0.82                  | 10%                   | 10%   |       |       |       |     |     |  |
| 1.0                   | 10%                   | 10%   | 10%   |       |       |     |     |  |

Percentages shown are dissipation factors



Percentages shown are dissipation factors

**NMC-P Series**  
Surface Mount Multilayer Ceramic Capacitors



**X7R VALUES AND SIZES (mm)**

| EIA Case Size         | 0805                  |       |       |       |       |       |       |       |       |       |
|-----------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Length (L)            | 2.00 ± 0.3            |       |       |       |       |       |       |       |       |       |
| Width (W)             | 1.25 ± 0.3            |       |       |       |       |       |       |       |       |       |
| Thickness max. (T)    | 1.55 max.             |       |       |       |       |       |       |       |       |       |
| Termination Width (P) | 0.30 min.             |       |       |       |       |       |       |       |       |       |
| Capacitance           | Working Voltage (Vdc) |       |       |       |       |       |       |       |       |       |
|                       | 10                    | 16    | 25    | 50    | 100   | 200   | 250   | 500   | 630   | 1KV   |
| 100pF                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 120                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 150                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 180                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 220                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 270                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 330                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 390                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 470                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 560                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 680                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 820                   | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 1000                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 1200                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 1500                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 1800                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 2200                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 2700                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 3300                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 3900                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 4700                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 5600                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 6800                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 8200                  | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 10000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 12000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 15000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 18000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 22000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 27000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 33000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 39000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 47000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 56000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 68000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 82000                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 0.1µF                 | 5%                    | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 0.12                  | 5%                    | 3.50% | 3.50% | 2.50% | 5%    |       |       |       |       |       |
| 0.15                  | 5%                    | 3.50% | 3.50% | 2.50% | 5%    |       |       |       |       |       |
| 0.18                  | 5%                    | 3.50% | 3.50% | 3%    | 5%    |       |       |       |       |       |
| 0.22                  | 5%                    | 3.50% | 3.50% | 3%    | 5%    |       |       |       |       |       |
| 0.27                  | 5%                    | 3.50% | 3.50% | 3%    |       |       |       |       |       |       |
| 0.33                  | 5%                    | 3.50% | 3.50% | 3%    |       |       |       |       |       |       |
| 0.39                  | 5%                    | 3.50% | 3.50% | 3%    |       |       |       |       |       |       |
| 0.47                  | 5%                    | 3.50% | 3.50% | 3%    | 10%   |       |       |       |       |       |
| 0.56                  | 5%                    | 3.50% | 3.50% |       |       |       |       |       |       |       |
| 0.68                  | 5%                    | 5%    | 3.50% |       |       |       |       |       |       |       |
| 0.82                  | 5%                    | 5%    | 3.50% |       |       |       |       |       |       |       |
| 1.0                   | 5%                    | 5%    | 3.50% | 10%   |       |       |       |       |       |       |
| 1.5                   | 5%                    | 5%    | 3.50% |       |       |       |       |       |       |       |
| 2.2                   | 10%                   | 10%   | 10%   |       |       |       |       |       |       |       |

Percentages shown are dissipation factors

**NMC-P Series**  
Surface Mount Multilayer Ceramic Capacitors



**X7R VALUES AND SIZES (mm)**

| EIA Case Size         | 1206                  |     |       |       |       |       |       |       |       |       |       |       |       |       |  |
|-----------------------|-----------------------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| Length (L)            | 3.20 ± 0.5            |     |       |       |       |       |       |       |       |       |       |       |       |       |  |
| Width (W)             | 1.60 ± 0.5            |     |       |       |       |       |       |       |       |       |       |       |       |       |  |
| Thickness max. (T)    | 3.10 max.             |     |       |       |       |       |       |       |       |       |       |       |       |       |  |
| Termination Width (P) | 0.25 min.             |     |       |       |       |       |       |       |       |       |       |       |       |       |  |
| Capacitance           | Working Voltage (Vdc) |     |       |       |       |       |       |       |       |       |       |       |       |       |  |
|                       | 10                    | 16  | 25    | 50    | 100   | 200   | 250   | 400   | 450   | 500   | 630   | 1KV   | 1.5KV | 2KV   |  |
| 100pF                 |                       |     |       |       |       | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 120                   |                       |     |       |       |       | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 150                   | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 180                   | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 220                   | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 270                   | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 330                   | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 390                   | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 470                   | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 560                   | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 680                   | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 820                   | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 1000                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 1200                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 1500                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 1800                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 2200                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 2700                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 3300                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 3900                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 4700                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 5600                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 6800                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 8200                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 10000                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 12000                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% |       |       |  |
| 15000                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% | 2.50% |       |       |  |
| 18000                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% |       |       |       |  |
| 22000                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% |       |       |       |  |
| 27000                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% |       |       |       |  |
| 33000                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% |       |       |       |  |
| 39000                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% |       |       |       |  |
| 47000                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% |       |       |       |  |
| 56000                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       | 2.50% | 2.50% |       |       |       |  |
| 68000                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |       |       |  |
| 82000                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |       |       |  |
| 0.1µF                 | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |       |       |  |
| 0.12                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% | 2.50% |       |       |       |       |       |       |       |       |  |
| 0.15                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% |       |       |       |       |       |       |       |       |       |  |
| 0.18                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% |       |       |       |       |       |       |       |       |       |  |
| 0.22                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% |       |       |       |       |       |       |       |       |       |  |
| 0.27                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% |       |       |       |       |       |       |       |       |       |  |
| 0.33                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% |       |       |       |       |       |       |       |       |       |  |
| 0.39                  | 5%                    | 5%  | 3.50% | 2.50% | 2.50% |       |       |       |       |       |       |       |       |       |  |
| 0.47                  | 5%                    | 5%  | 3.50% | 3%    | 3%    |       |       |       |       |       |       |       |       |       |  |
| 0.56                  | 5%                    | 5%  | 3.50% | 3%    | 3%    |       |       |       |       |       |       |       |       |       |  |
| 0.68                  | 5%                    | 5%  | 3.50% | 3%    | 3%    |       |       |       |       |       |       |       |       |       |  |
| 0.82                  | 5%                    | 5%  | 3.50% | 3%    | 3%    |       |       |       |       |       |       |       |       |       |  |
| 1.0                   | 5%                    | 5%  | 3.50% | 3%    | 3%    |       |       |       |       |       |       |       |       |       |  |
| 1.5                   | 5%                    | 5%  | 3.50% |       |       |       |       |       |       |       |       |       |       |       |  |
| 2.2                   | 10%                   | 10% | 3.50% | 10%   |       |       |       |       |       |       |       |       |       |       |  |
| 3.3                   | 10%                   | 10% | 3.50% |       |       |       |       |       |       |       |       |       |       |       |  |
| 4.7                   | 10%                   | 10% | 10%   | 2.5%  |       |       |       |       |       |       |       |       |       |       |  |
| 10                    | 10%                   |     |       |       |       |       |       |       |       |       |       |       |       |       |  |

Percentages shown are dissipation factors



**X7R VALUES AND SIZES (mm)**

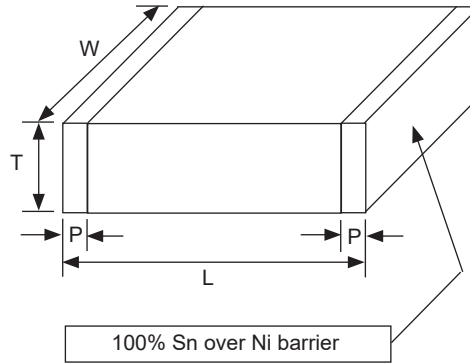
| EIA Case Size         | 1210                  |      |      |      |      |      |      |      |      |      |      |      |       |      |  |
|-----------------------|-----------------------|------|------|------|------|------|------|------|------|------|------|------|-------|------|--|
| Length (L)            | 3.20 ± 0.6            |      |      |      |      |      |      |      |      |      |      |      |       |      |  |
| Width (W)             | 2.50 ± 0.5            |      |      |      |      |      |      |      |      |      |      |      |       |      |  |
| Thickness max. (T)    | 3.00 max.             |      |      |      |      |      |      |      |      |      |      |      |       |      |  |
| Termination Width (P) | 0.50 min.             |      |      |      |      |      |      |      |      |      |      |      |       |      |  |
| Capacitance           | Working Voltage (Vdc) |      |      |      |      |      |      |      |      |      |      |      |       |      |  |
|                       | 10                    | 16   | 25   | 50   | 100  | 200  | 250  | 400  | 450  | 500  | 630  | 1KV  | 1.5KV | 2KV  |  |
| 100pF                 |                       |      |      |      |      |      |      |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 120                   |                       |      |      |      |      |      |      |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 150                   |                       |      |      |      |      |      |      |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 180                   |                       |      |      |      |      |      |      |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 220                   |                       |      |      |      |      |      |      |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 270                   |                       |      |      |      |      |      |      |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 330                   |                       |      |      |      |      |      |      |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 390                   |                       |      |      |      |      |      |      |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 470                   |                       |      |      |      |      |      |      |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 560                   |                       |      |      |      |      |      |      |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 680                   |                       |      |      |      |      |      |      |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 820                   |                       |      |      |      |      |      |      |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 1000                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 1200                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 1500                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 1800                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 2200                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 2700                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 3300                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 3900                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 4700                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 5600                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 6800                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 8200                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% | 2.5%  | 2.5% |  |
| 10000                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% |       |      |  |
| 12000                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% |       |      |  |
| 15000                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% |       |      |  |
| 18000                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% |       |      |  |
| 22000                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% |       |      |  |
| 27000                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% |       |      |  |
| 33000                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% |       |      |  |
| 39000                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% |       |      |  |
| 47000                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% | 2.5% |       |      |  |
| 56000                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% |      |       |      |  |
| 68000                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% |      |       |      |  |
| 82000                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% |      |       |      |  |
| 0.1µF                 | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      | 2.5% | 2.5% |      |       |      |  |
| 0.12                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |      |       |      |  |
| 0.15                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |      |       |      |  |
| 0.18                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |      |       |      |  |
| 0.22                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |      |       |      |  |
| 0.27                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |      |       |      |  |
| 0.33                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |      |       |      |  |
| 0.47                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |      |      |      |       |      |  |
| 0.56                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |      |      |      |       |      |  |
| 0.68                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |      |      |      |       |      |  |
| 0.82                  | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |      |      |      |      |      |      |      |       |      |  |
| 1.0                   | 5%                    | 3.5% | 3.5% | 2.5% | 2.5% |      |      |      |      |      |      |      |       |      |  |
| 1.5                   |                       | 3.5% | 3.5% | 2.5% | 2.5% |      |      |      |      |      |      |      |       |      |  |
| 2.2                   |                       | 3.5% | 3.5% | 2.5% | 5%   |      |      |      |      |      |      |      |       |      |  |
| 3.3                   |                       | 3.5% | 3.5% | 2.5% |      |      |      |      |      |      |      |      |       |      |  |
| 4.7                   | 5%                    | 3.5% | 3.5% | 5%   | 10%  |      |      |      |      |      |      |      |       |      |  |
| 10                    | 5%                    | 3.5% | 3.5% | 10%  |      |      |      |      |      |      |      |      |       |      |  |

Percentages shown are dissipation factors



**X7R VALUES AND SIZES (mm)**

| EIA Case Size         | 1808                  |      |      |       |      |      |
|-----------------------|-----------------------|------|------|-------|------|------|
| Length (L)            | 4.50 +0.6/-0.4        |      |      |       |      |      |
| Width (W)             | 2.03 ± 0.25           |      |      |       |      |      |
| Thickness max. (T)    | 2.20 max.             |      |      |       |      |      |
| Termination Width (P) | 0.25min.              |      |      |       |      |      |
| Capacitance           | Working Voltage (Vdc) |      |      |       |      |      |
|                       | 500                   | 630  | 1KV  | 1.5KV | 2KV  | 3KV  |
| 150pF                 | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 180                   | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 220                   | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 270                   | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 330                   | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 390                   | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 470                   | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 560                   | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 680                   | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 820                   | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 1000                  | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 1200                  | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 1500                  | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 1800                  | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% | 2.5% |
| 2200                  | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% |      |
| 2700                  | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% |      |
| 3300                  | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% |      |
| 3900                  | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% |      |
| 4700                  | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% |      |
| 5600                  | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% |      |
| 6800                  | 2.5%                  | 2.5% | 2.5% | 2.5%  | 2.5% |      |
| 8200                  | 2.5%                  | 2.5% | 2.5% |       |      |      |
| 10000                 | 2.5%                  | 2.5% | 2.5% |       |      |      |
| 12000                 | 2.5%                  | 2.5% | 2.5% |       |      |      |
| 15000                 | 2.5%                  | 2.5% | 2.5% |       |      |      |
| 18000                 | 2.5%                  | 2.5% | 2.5% |       |      |      |
| 22000                 | 2.5%                  | 2.5% | 2.5% |       |      |      |
| 27000                 | 2.5%                  | 2.5% | 2.5% |       |      |      |
| 33000                 | 2.5%                  | 2.5% | 2.5% |       |      |      |
| 39000                 | 2.5%                  | 2.5% | 2.5% |       |      |      |
| 47000                 | 2.5%                  | 2.5% | 2.5% |       |      |      |
| 56000                 | 2.5%                  | 2.5% | 2.5% |       |      |      |
| 68000                 | 2.5%                  | 2.5% |      |       |      |      |
| 82000                 | 2.5%                  | 2.5% |      |       |      |      |



Percentages shown are dissipation factors

**NMC-P Series**  
Surface Mount Multilayer Ceramic Capacitors



**X7R VALUES AND SIZES (mm)**

| EIA Case Size         | 1812                  |       |       |       |       |       |       |       |       |       |       |       |       |  |
|-----------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| Length (L)            | 4.50 +0.6/-0.4        |       |       |       |       |       |       |       |       |       |       |       |       |  |
| Width (W)             | 3.20 ± 0.4            |       |       |       |       |       |       |       |       |       |       |       |       |  |
| Thickness max. (T)    | 3.00 max.             |       |       |       |       |       |       |       |       |       |       |       |       |  |
| Termination Width (P) | 0.25 min.             |       |       |       |       |       |       |       |       |       |       |       |       |  |
| Capacitance           | Working Voltage (Vdc) |       |       |       |       |       |       |       |       |       |       |       |       |  |
|                       | 10                    | 16    | 25    | 50    | 100   | 200   | 250   | 500   | 630   | 1KV   | 1.5KV | 2KV   | 3KV   |  |
| 270pF                 |                       |       |       |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 330                   |                       |       |       |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 390                   |                       |       |       |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 470                   |                       |       |       |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 560                   |                       |       |       |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 680                   |                       |       |       |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 820                   |                       |       |       |       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 1000                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 1200                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 1500                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 1800                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 2200                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 2700                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 3300                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 3900                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 4700                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 5600                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 6800                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 8200                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 10000                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 12000                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 15000                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 18000                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 22000                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 27000                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 33000                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 39000                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 47000                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 56000                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 68000                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 82000                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 0.1µF                 | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 0.12                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 0.15                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 0.18                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 0.22                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 0.27                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 0.33                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 0.39                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 0.47                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 0.56                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 0.68                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 0.82                  | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 1.0                   | 5%                    | 3.50% | 3.50% | 3.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |  |
| 1.5                   |                       |       |       |       | 2.50% |       |       |       |       |       |       |       |       |  |
| 2.2                   |                       |       |       | 3.50% | 2.50% |       |       |       |       |       |       |       |       |  |
| 4.7                   |                       |       |       | 2.5%  |       |       |       |       |       |       |       |       |       |  |
| 10                    |                       |       |       | 10%   |       |       |       |       |       |       |       |       |       |  |

Percentages shown are dissipation factors

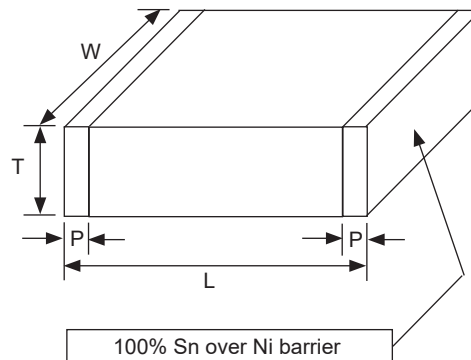




**X7R VALUES AND SIZES (mm)**

| EIA Case Size         | 1825                  |       |       |       |       |       |       |       |
|-----------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|
| Length (L)            | 4.50 +0.6/-0.4        |       |       |       |       |       |       |       |
| Width (W)             | 6.30 ± 0.4            |       |       |       |       |       |       |       |
| Thickness max. (T)    | 3.10 max.             |       |       |       |       |       |       |       |
| Termination Width (P) | 0.40 min.             |       |       |       |       |       |       |       |
| Capacitance           | Working Voltage (Vdc) |       |       |       |       |       |       |       |
|                       | 50                    | 100   | 250   | 500   | 630   | 1KV   | 2KV   | 3KV   |
| 1000pF                |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 1200                  |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 1500                  |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 1800                  |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 2200                  |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 2700                  |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 3300                  |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 3900                  |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 4700                  |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 5600                  |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 6800                  |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 8200                  |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 10000                 |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 12000                 |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 15000                 |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 18000                 |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 22000                 |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |
| 27000                 |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |
| 33000                 |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |
| 39000                 |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |
| 47000                 |                       |       | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |
| 56000                 |                       |       | 2.50% | 2.50% | 2.50% | 2.50% |       |       |
| 68000                 |                       |       | 2.50% | 2.50% | 2.50% | 2.50% |       |       |
| 82000                 |                       |       | 2.50% | 2.50% | 2.50% | 2.50% |       |       |
| 0.1µF                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |
| 0.12                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.15                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.18                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.22                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.27                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.33                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.47                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.56                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.68                  | 2.50%                 | 2.50% | 2.50% |       |       |       |       |       |
| 0.82                  | 2.50%                 | 2.50% | 2.50% |       |       |       |       |       |
| 1.0                   | 2.50%                 | 2.50% | 2.50% |       |       |       |       |       |
| 2.2                   | 2.50%                 |       |       |       |       |       |       |       |

Percentages shown are dissipation factors

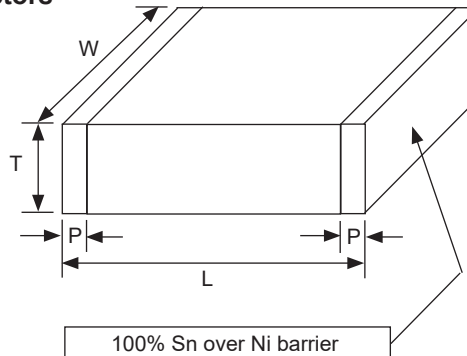




**X7R VALUES AND SIZES (mm)**

| EIA Case Size         | 2220                  |       |       |       |       |       |       |       |       |
|-----------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Length (L)            | 5.70 ± 0.5            |       |       |       |       |       |       |       |       |
| Width (W)             | 5.00 ± 0.4            |       |       |       |       |       |       |       |       |
| Thickness max. (T)    | 3.10 max.             |       |       |       |       |       |       |       |       |
| Termination Width (P) | 0.50 min.             |       |       |       |       |       |       |       |       |
| Capacitance           | Working Voltage (Vdc) |       |       |       |       |       |       |       |       |
|                       | 25                    | 50    | 100   | 250   | 500   | 630   | 1KV   | 2KV   | 3KV   |
| 1000pF                | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 1200                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 1500                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 1800                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 2200                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 2700                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 3300                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 3900                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 4700                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 5600                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 6800                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 8200                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 10000                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 12000                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 15000                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 18000                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |
| 22000                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |
| 27000                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |
| 33000                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |
| 39000                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |
| 47000                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |
| 56000                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |
| 68000                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |
| 82000                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |
| 0.1µF                 | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |
| 0.12                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |
| 0.15                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |
| 0.18                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |
| 0.22                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |
| 0.27                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.33                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.47                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.56                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.68                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 0.82                  | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 1.0                   | 2.50%                 | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% |       |       |       |
| 1.5                   | 2.50%                 | 2.50% | 2.50% | 2.50% |       |       |       |       |       |
| 2.2                   | 2.50%                 | 2.50% | 2.50% | 2.50% |       |       |       |       |       |
| 3.3                   |                       | 2.50% | 2.50% |       |       |       |       |       |       |
| 4.7                   |                       | 2.50% | 2.50% |       |       |       |       |       |       |
| 6.8                   |                       | 2.50% | 2.50% |       |       |       |       |       |       |
| 10                    |                       | 2.50% | 2.50% |       |       |       |       |       |       |

Percentages shown are dissipation factors

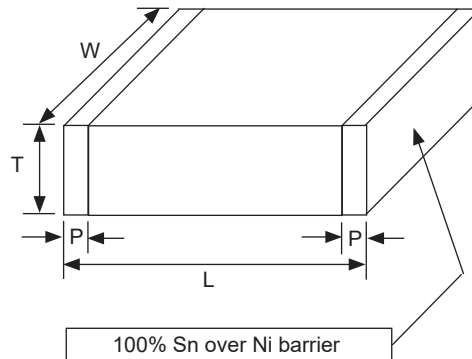




**X7R VALUES AND SIZES (mm)**

| EIA Case Size         | 2225                  |      |      |      |      |      |      |      |
|-----------------------|-----------------------|------|------|------|------|------|------|------|
| Length (L)            | 5.70 ± 0.5            |      |      |      |      |      |      |      |
| Width (W)             | 6.30 ± 0.4            |      |      |      |      |      |      |      |
| Thickness max. (T)    | 3.10 max.             |      |      |      |      |      |      |      |
| Termination Width (P) | 0.50 min.             |      |      |      |      |      |      |      |
| Capacitance           | Working Voltage (Vdc) |      |      |      |      |      |      |      |
|                       | 50                    | 100  | 250  | 500  | 630  | 1KV  | 2KV  | 3KV  |
| 1000pF                |                       |      |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 1200                  |                       |      |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 1500                  |                       |      |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 1800                  |                       |      |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 2200                  |                       |      |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 2700                  |                       |      |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 3300                  |                       |      |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 3900                  |                       |      |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 4700                  |                       |      |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 5600                  |                       |      |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 6800                  |                       |      |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 8200                  |                       |      |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 10000                 |                       |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 12000                 |                       |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 15000                 |                       |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 18000                 |                       |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 22000                 |                       |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |
| 27000                 |                       |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |
| 33000                 |                       |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |
| 39000                 |                       |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |
| 47000                 |                       |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |
| 56000                 |                       |      | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |
| 68000                 |                       |      | 2.5% | 2.5% | 2.5% | 2.5% |      |      |
| 82000                 |                       |      | 2.5% | 2.5% | 2.5% | 2.5% |      |      |
| 0.1µF                 | 2.5%                  | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |
| 0.12                  | 2.5%                  | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |
| 0.15                  | 2.5%                  | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |
| 0.18                  | 2.5%                  | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |
| 0.22                  | 2.5%                  | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% |      |      |
| 0.27                  | 2.5%                  | 2.5% | 2.5% | 2.5% | 2.5% |      |      |      |
| 0.33                  | 2.5%                  | 2.5% | 2.5% | 2.5% | 2.5% |      |      |      |
| 0.47                  | 2.5%                  | 2.5% |      | 2.5% | 2.5% |      |      |      |
| 0.56                  | 2.5%                  | 2.5% |      | 2.5% | 2.5% |      |      |      |
| 0.68                  | 2.5%                  | 2.5% |      |      |      |      |      |      |
| 1.0                   | 2.5%                  | 2.5% |      |      |      |      |      |      |
| 1.5                   | 2.5%                  | 2.5% |      |      |      |      |      |      |
| 2.2                   | 2.5%                  | 2.5% |      |      |      |      |      |      |
| 3.3                   | 2.5%                  | 2.5% |      |      |      |      |      |      |
| 4.7                   | 2.5%                  | 2.5% |      |      |      |      |      |      |
| 6.8                   | 2.5%                  |      |      |      |      |      |      |      |
| 10                    | 2.5%                  |      |      |      |      |      |      |      |

Percentages shown are dissipation factors





**X7R Insulation Resistance**

| Size | Capacitance | Voltage | IR Mohm (min.) | Size | Capacitance | Voltage | IR Mohm (min.) | Size | Capacitance | Voltage  | IR Mohm (min.) | Size | Capacitance | Voltage | IR Mohm (min.) |
|------|-------------|---------|----------------|------|-------------|---------|----------------|------|-------------|----------|----------------|------|-------------|---------|----------------|
| 0402 | 100~47000   | 10~16   | 10000          | 0603 | 100~47000   | 10~50   | 10000          | 0805 | 100~4700    | 10~50    | 10000          | 1206 | 150~47000   | 10~50   | 10000          |
| 0402 | 56000       | 10~16   | 8928           | 0603 | 56000       | 10~50   | 8928           | 0805 | 56000       | 10~50    | 8928           | 1206 | 56000       | 10~50   | 8928           |
| 0402 | 68000       | 10~16   | 7352           | 0603 | 68000       | 10~50   | 7352           | 0805 | 68000       | 10~50    | 7352           | 1206 | 68000       | 10~50   | 7352           |
| 0402 | 82000       | 10~16   | 6097           | 0603 | 82000       | 10~50   | 6097           | 0805 | 82000       | 10~50    | 6097           | 1206 | 82000       | 10~50   | 6097           |
| 0402 | 100000      | 10~16   | 5000           | 0603 | 100000      | 10~50   | 5000           | 0805 | 100000      | 10~50    | 5000           | 1206 | 100000      | 10~50   | 5000           |
|      |             |         |                | 0603 | 120000      | 10~25   | 4166           | 0805 | 120000      | 10~50    | 4166           | 1206 | 120000      | 10~50   | 4166           |
| 0402 | All         | 25      | 10000          | 0603 | 150000      | 10~25   | 3333           | 0805 | 150000      | 10~50    | 3333           | 1206 | 150000      | 10~50   | 3333           |
| 0402 | All         | 50      | 10000          | 0603 | 180000      | 10~25   | 2777           | 0805 | 180000      | 10~50    | 2777           | 1206 | 180000      | 10~50   | 2777           |
| 0402 | All         | 100     | 10000          | 0603 | 220000      | 10~50   | 2272           | 0805 | 220000      | 10~50    | 2272           | 1206 | 220000      | 10~50   | 2272           |
|      |             |         |                | 0603 | 270000      | 10~25   | 1851           | 0805 | 270000      | 10~50    | 1851           | 1206 | 270000      | 10~50   | 1851           |
|      |             |         |                | 0603 | 330000      | 10~25   | 1515           | 0805 | 330000      | 10~50    | 1515           | 1206 | 330000      | 10~50   | 1515           |
|      |             |         |                | 0603 | 390000      | 10~25   | 1282           | 0805 | 390000      | 10~50    | 1282           | 1206 | 390000      | 10~50   | 1282           |
|      |             |         |                | 0603 | 470000      | 10~25   | 212            | 0805 | 470000      | 10~50    | 1063.8         | 1206 | 470000      | 10~50   | 1063           |
|      |             |         |                | 0603 | 560000      | 10~16   | 178            | 0805 | 560000      | 10~25    | 892.8          | 1206 | 560000      | 10~50   | 892            |
|      |             |         |                | 0603 | 680000      | 10~16   | 147            | 0805 | 680000      | 10~25    | 735.2          | 1206 | 680000      | 10~50   | 735            |
|      |             |         |                | 0603 | 820000      | 10~16   | 121            | 0805 | 820000      | 10~25    | 609.7          | 1206 | 820000      | 10~50   | 609            |
|      |             |         |                | 0603 | 1000000     | 10~25   | 100            | 0805 | 1000000     | 10~50    | 500            | 1206 | 1000000     | 10~50   | 500            |
|      |             |         |                |      |             |         |                | 0805 | 1500000     | 10~25    | 333.3          | 1206 | 1500000     | 10~25   | 333            |
|      |             |         |                |      |             |         |                | 0805 | 2200000     | 10~25    | 45.4           | 1206 | 2200000     | 10~50   | 227            |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 3300000     | 10~25   | 151            |
|      |             |         |                | 0603 | 100~10000   | 100     | 10000          | 0805 | 100~2200    | 100~1000 | 10000          | 1206 | 4700000     | 10~50   | 21             |
|      |             |         |                | 0603 | 12000       | 100     | 8333           | 0805 | 2700~10000  | 100~630  | 10000          | 1206 | 10000000    | 10      | 10             |
|      |             |         |                | 0603 | 15000       | 100     | 6666           | 0805 | 12000       | 100~630  | 8333           |      |             |         |                |
|      |             |         |                | 0603 | 18000       | 100     | 5555           | 0805 | 15000       | 100~630  | 6666           |      |             |         |                |
|      |             |         |                | 0603 | 22000       | 100     | 4545           | 0805 | 18000       | 100~630  | 5555           | 1206 | 150~10000   | 100~630 | 10000          |
|      |             |         |                | 0603 | 27000       | 100     | 3703           | 0805 | 22000       | 100~630  | 4545           | 1206 | 12000       | 100~630 | 8333           |
|      |             |         |                | 0603 | 33000       | 100     | 3030           | 0805 | 27000       | 100~630  | 3703           | 1206 | 15000       | 100~630 | 6666           |
|      |             |         |                | 0603 | 39000       | 100     | 2564           | 0805 | 33000       | 100~500  | 3030           | 1206 | 18000       | 100~630 | 5555           |
|      |             |         |                | 0603 | 47000       | 100     | 2127           | 0805 | 39000       | 100~250  | 2564           | 1206 | 22000       | 100~630 | 4545           |
|      |             |         |                | 0603 | 56000       | 100     | 1785           | 0805 | 47000       | 100~250  | 2127           | 1206 | 27000       | 100~630 | 3703           |
|      |             |         |                | 0603 | 68000       | 100     | 1470           | 0805 | 56000       | 100~250  | 1785           | 1206 | 33000       | 100~630 | 3030           |
|      |             |         |                | 0603 | 82000       | 100     | 1219           | 0805 | 68000       | 100~250  | 1470           | 1206 | 39000       | 100~630 | 2564           |
|      |             |         |                | 0603 | 100000      | 100     | 1000           | 0805 | 82000       | 100~200  | 1219           | 1206 | 47000       | 100~630 | 2127           |
|      |             |         |                |      |             |         |                | 0805 | 100000      | 100~200  | 1000           | 1206 | 56000       | 100~630 | 1785           |
|      |             |         |                | 0603 | All         | 200~250 | 10000          | 0805 | 120000      | 100      | 833            | 1206 | 68000       | 100~450 | 1470           |
|      |             |         |                |      |             |         |                | 0805 | 150000      | 100      | 666            | 1206 | 82000       | 100~450 | 1219           |
|      |             |         |                |      |             |         |                | 0805 | 180000      | 100      | 555            | 1206 | 100000      | 100~450 | 1000           |
|      |             |         |                |      |             |         |                | 0805 | 220000      | 100      | 454            | 1206 | 120000      | 100     | 833            |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 150000      | 100     | 666            |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 180000      | 100     | 555            |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 220000      | 100     | 454            |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 270000      | 100     | 370            |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 330000      | 100     | 303            |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 390000      | 100     | 256            |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 470000      | 100     | 212            |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 560000      | 100     | 178            |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 680000      | 100     | 147            |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 820000      | 100     | 121            |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 1000000     | 100     | 100            |
|      |             |         |                |      |             |         |                |      |             |          |                |      |             |         |                |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 100~10000   | 1000    | 10000          |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 12000       | 1000    | 8333           |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | 15000       | 1000    | 6666           |
|      |             |         |                |      |             |         |                |      |             |          |                |      |             |         |                |
|      |             |         |                |      |             |         |                |      |             |          |                | 1206 | All         | 2000    | 10000          |

# NMC-P Series

## Surface Mount Multilayer Ceramic Capacitors



### X7R Insulation Resistance

| Size | Capacitance | Voltage | IR Mohm (min.) | Size | Capacitance | Voltage | IR Mohm (min.) | Size | Capacitance | Voltage | IR Mohm (min.) | Size | Capacitance | Voltage | IR Mohm (min.) |
|------|-------------|---------|----------------|------|-------------|---------|----------------|------|-------------|---------|----------------|------|-------------|---------|----------------|
| 1210 | 47000000    | 6.3     | 2.12           | 1808 | 150~10000   | 500~1KV | 10000          | 1812 | 1000~10000  | 10~1KV  | 10000          | 1825 | 1000~10000  | 250~3KV | 10000          |
|      |             |         |                | 1808 | 12000       | 500     | 8333           | 1812 | 12000       | 10~1KV  | 8333           | 1825 | 12000       | 250~3KV | 8333           |
| 1210 | 1000~47000  | 10~50   | 10000          | 1808 | 15000       | 500     | 6666           | 1812 | 15000       | 10~1KV  | 6666           | 1825 | 15000       | 250~3KV | 6666           |
| 1210 | 56000       | 10~50   | 8928           | 1808 | 18000       | 500     | 5555           | 1812 | 18000       | 10~1KV  | 5555           | 1825 | 18000       | 250~3KV | 5555           |
| 1210 | 68000       | 10~50   | 7352           | 1808 | 22000       | 500     | 4545           | 1812 | 22000       | 10~1KV  | 4545           | 1825 | 22000       | 250~2KV | 4545           |
| 1210 | 82000       | 10~50   | 6097           | 1808 | 27000       | 500     | 3703           | 1812 | 27000       | 10~1KV  | 3703           | 1825 | 27000       | 250~2KV | 3703           |
| 1210 | 100000      | 10~50   | 5000           | 1808 | 33000       | 500     | 3030           | 1812 | 33000       | 10~1KV  | 3030           | 1825 | 33000       | 250~2KV | 3030           |
| 1210 | 120000      | 10~50   | 4166           | 1808 | 39000       | 500     | 2564           | 1812 | 39000       | 10~1KV  | 2564           | 1825 | 39000       | 250~2KV | 2564           |
| 1210 | 150000      | 10~50   | 3333           | 1808 | 47000       | 500     | 2127           | 1812 | 47000       | 10~1KV  | 2127           | 1825 | 47000       | 250~2KV | 2127           |
| 1210 | 180000      | 10~50   | 2777           | 1808 | 56000       | 500     | 1785           | 1812 | 56000       | 10~1KV  | 1785           | 1825 | 56000       | 250~1KV | 1785           |
| 1210 | 220000      | 10~50   | 2272           | 1808 | 68000       | 500     | 1470           | 1812 | 68000       | 10~1KV  | 1470           | 1825 | 68000       | 250~1KV | 1470           |
| 1210 | 270000      | 10~50   | 1851           | 1808 | 82000       | 500     | 1219           | 1812 | 82000       | 10~1KV  | 1219           | 1825 | 82000       | 250~1KV | 1219           |
| 1210 | 330000      | 10~50   | 1515           |      |             |         |                | 1812 | 100000      | 10~1KV  | 1000           | 1825 | 100000      | 50~1KV  | 1000           |
| 1210 | 390000      | 10~50   | 1282           | 1808 | All         | 1500    | 10000          | 1812 | 120000      | 10~630  | 833            | 1825 | 120000      | 50~630  | 833            |
| 1210 | 470000      | 10~50   | 1063           | 1808 | All         | 2000    | 10000          | 1812 | 150000      | 10~630  | 666            | 1825 | 150000      | 50~630  | 666            |
| 1210 | 560000      | 10~50   | 892            | 1808 | All         | 3000    | 10000          | 1812 | 180000      | 10~630  | 555            | 1825 | 180000      | 50~630  | 555            |
| 1210 | 680000      | 10~50   | 735            |      |             |         |                | 1812 | 220000      | 10~630  | 454            | 1825 | 220000      | 50~630  | 454            |
| 1210 | 820000      | 10~50   | 609            |      |             |         |                | 1812 | 270000      | 10~500  | 370            | 1825 | 270000      | 50~630  | 370            |
| 1210 | 1000000     | 10~50   | 500            |      |             |         |                | 1812 | 330000      | 10~500  | 303            | 1825 | 330000      | 50~630  | 303            |
| 1210 | 2200000     | 10~50   | 227            |      |             |         |                | 1812 | 390000      | 10~500  | 256            | 1825 | 390000      | 50~630  | 256            |
| 1210 | 3300000     | 10~50   | 151            |      |             |         |                | 1812 | 470000      | 10~500  | 212            | 1825 | 470000      | 50~630  | 212            |
| 1210 | 3300000     | 10~50   | 151            |      |             |         |                | 1812 | 560000      | 10~250  | 178            | 1825 | 560000      | 50~630  | 178            |
| 1210 | 4700000     | 10~50   | 21.2           |      |             |         |                | 1812 | 680000      | 10~250  | 147            | 1825 | 680000      | 50~250  | 147            |
| 1210 | 10000000    | 10~50   | 10             |      |             |         |                | 1812 | 820000      | 10~250  | 121            | 1825 | 820000      | 50~250  | 121            |
|      |             |         |                |      |             |         |                | 1812 | 1000000     | 10~250  | 100            | 1825 | 1000000     | 50~250  | 100            |
| 1210 | 1000~10000  | 100~1KV | 10000          |      |             |         |                | 1812 | 4700000     | 50      | 106            | 1825 | 2200000     | 50      | 227            |
| 1210 | 12000       | 100~1KV | 8333           |      |             |         |                | 1812 | 10000000    | 50      | 50             |      |             |         |                |
| 1210 | 15000       | 100~1KV | 6666           |      |             |         |                | 1812 | All         | 1500KV  | 10000          |      |             |         |                |
| 1210 | 18000       | 100~1KV | 5555           |      |             |         |                | 1812 | All         | 2000KV  | 10000          |      |             |         |                |
| 1210 | 22000       | 100~1KV | 4545           |      |             |         |                | 1812 | All         | 3000KV  | 10000          |      |             |         |                |
| 1210 | 27000       | 100~1KV | 3703           |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 33000       | 100~1KV | 3030           |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 39000       | 100~1KV | 2564           |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 47000       | 100~1KV | 2127           |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 56000       | 100~1KV | 1785           |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 68000       | 100~1KV | 1470           |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 82000       | 100~1KV | 1219           |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 100000      | 100~1KV | 1000           |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 120000      | 100~1KV | 833            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 150000      | 100~1KV | 666            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 180000      | 100~1KV | 555            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 220000      | 100~1KV | 454            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 270000      | 100~1KV | 370            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 330000      | 100~1KV | 303            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 390000      | 100~1KV | 256            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 470000      | 100~1KV | 212            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 560000      | 100~1KV | 178            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 680000      | 100~1KV | 147            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 820000      | 100~1KV | 121            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 1000000     | 100~1KV | 100            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 1500000     | 100~1KV | 66             |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 2200000     | 100~1KV | 45             |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | 4700000     | 100V    | 106            |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | All         | 1500    | 10000          |      |             |         |                |      |             |         |                |      |             |         |                |
| 1210 | All         | 2000    | 10000          |      |             |         |                |      |             |         |                |      |             |         |                |



**X7R Insulation Resistance**

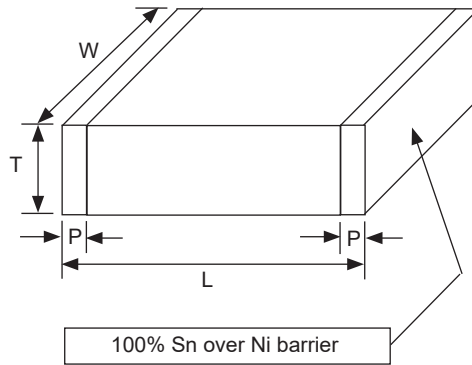
| Size | Capacitance | Voltage | IR Mohm (min.) | Size | Capacitance | Voltage | IR Mohm (min.) |
|------|-------------|---------|----------------|------|-------------|---------|----------------|
| 2220 | 1000~47000  | 25~2KV  | 10000          | 2225 | 1000~47000  | 250~2KV | 10000          |
| 2220 | 56000       | 25~2KV  | 8928           | 2225 | 56000       | 250~2KV | 8928           |
| 2220 | 68000       | 25~1KV  | 7352           | 2225 | 68000       | 250~1KV | 7352           |
| 2220 | 82000       | 25~1KV  | 6097           | 2225 | 82000       | 250~1KV | 6097           |
| 2220 | 100000      | 25~1KV  | 5000           | 2225 | 100000      | 50~1KV  | 5000           |
| 2220 | 120000      | 25~1KV  | 4166           | 2225 | 120000      | 50~1KV  | 4166           |
| 2220 | 150000      | 25~1KV  | 3333           | 2225 | 150000      | 50~1KV  | 3333           |
| 2220 | 180000      | 25~1KV  | 2777           | 2225 | 180000      | 50~1KV  | 2777           |
| 2220 | 220000      | 25~1KV  | 2272           | 2225 | 220000      | 50~1KV  | 2272           |
| 2220 | 270000      | 25~630  | 1851           | 2225 | 270000      | 50~630  | 1851           |
| 2220 | 330000      | 25~630  | 1515           | 2225 | 330000      | 50~630  | 1515           |
| 2220 | 390000      | 25~630  | 1282           | 2225 | 470000      | 500~630 | 1063           |
| 2220 | 470000      | 25~630  | 1063           | 2225 | 560000      | 500~630 | 892            |
| 2220 | 560000      | 25~630  | 1000           |      |             |         |                |
| 2220 | 680000      | 25~630  | 735            | 2225 | All         | 3KV     | 10000          |
| 2220 | 820000      | 25~630  | 609            |      |             |         |                |
| 2220 | 1000000     | 25~630  | 500            |      |             |         |                |
| 2220 | 1500000     | 25~250  | 333            |      |             |         |                |
| 2220 | 2200000     | 25~250  | 227            |      |             |         |                |
| 2220 | 3300000     | 50~100  | 151            |      |             |         |                |
| 2220 | 4700000     | 50~100  | 106            |      |             |         |                |
| 2220 | 6800000     | 50~100  | 73             |      |             |         |                |
| 2220 | 10000000    | 50~100  | 50             |      |             |         |                |
|      |             |         |                |      |             |         |                |
| 2220 | All         | 3KV     | 10000          |      |             |         |                |



**X5R VALUES AND SIZES (mm)**

| EIA Case Size         | 0402                  |     |     |    | 0603       |     |     |      | 0805       |     |     |     | 1206       |     |      |      | 1210       |     |      |    |      |
|-----------------------|-----------------------|-----|-----|----|------------|-----|-----|------|------------|-----|-----|-----|------------|-----|------|------|------------|-----|------|----|------|
| Length (L)            | 1.00 ± 0.2            |     |     |    | 1.60 ± 0.3 |     |     |      | 2.00 ± 0.3 |     |     |     | 3.20 ± 0.5 |     |      |      | 3.20 ± 0.6 |     |      |    |      |
| Width (W)             | 0.50 ± 0.2            |     |     |    | 0.80 ± 0.2 |     |     |      | 1.25 ± 0.3 |     |     |     | 1.60 ± 0.5 |     |      |      | 2.50 ± 0.5 |     |      |    |      |
| Thickness max. (T)    | 0.70 max.             |     |     |    | 1.10 max.  |     |     |      | 1.55 max.  |     |     |     | 3.10 max.  |     |      |      | 3.00 max.  |     |      |    |      |
| Termination Width (P) | 0.15 min.             |     |     |    | 0.25 min.  |     |     |      | 0.30 min.  |     |     |     | 0.25 min.  |     |      |      | 0.25 min.  |     |      |    |      |
| Capacitance           | Working Voltage (Vdc) |     |     |    |            |     |     |      |            |     |     |     |            |     |      |      |            |     |      |    |      |
|                       | 6.3                   | 10  | 16  | 25 | 6.3        | 10  | 16  | 25   | 6.3        | 10  | 16  | 25  | 6.3        | 10  | 16   | 25   | 6.3        | 10  | 16   | 25 |      |
| 33000pF               |                       |     | 5%  |    |            |     |     |      |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 39000                 |                       |     | 5%  |    |            |     |     |      |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 47000                 |                       |     | 5%  |    |            |     |     |      |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 56000                 |                       | 5%  | 5%  |    |            |     |     |      |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 68000                 |                       | 5%  | 5%  |    |            |     |     |      |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 82000                 | 10%                   | 5%  | 5%  |    |            |     |     |      |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 0.1µF                 | 10%                   | 5%  | 5%  | 5% |            |     |     |      |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 0.15                  | 10%                   | 5%  | 5%  | 5% |            |     |     |      |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 0.22                  | 10%                   | 5%  | 10% | 5% |            |     |     | 5%   | 3.5%       |     |     |     |            |     |      |      |            |     |      |    |      |
| 0.27                  |                       |     |     |    |            |     | 5%  | 5%   | 3.5%       |     |     |     |            |     |      |      |            |     |      |    |      |
| 0.33                  | 10%                   | 10% |     |    | 10%        | 10% | 5%  | 3.5% |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 0.39                  |                       |     |     |    |            | 10% | 5%  | 3.5% |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 0.47                  | 10%                   | 10% |     |    |            | 10% | 5%  | 10%  |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 0.68                  | 10%                   | 10% |     |    | 10%        | 10% | 10% | 10%  |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 0.82                  |                       |     |     |    | 10%        | 10% | 10% |      |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 1.0                   |                       |     |     |    | 10%        | 10% | 10% | 10%  |            |     |     |     |            |     |      |      |            |     |      |    |      |
| 1.5                   |                       |     |     |    | 10%        |     |     |      | 10%        | 5%  | 5%  | 5%  |            | 5%  | 3.5% |      |            | 5%  | 3.5% |    |      |
| 2.2                   |                       |     |     |    | 10%        | 10% | 10% |      | 10%        | 10% | 10% | 10% |            | 10% | 5%   | 3.5% |            | 5%  | 3.5% |    |      |
| 3.3                   |                       |     |     |    | 10%        |     |     |      | 10%        | 10% | 10% | 10% |            | 10% | 5%   | 3.5% |            |     |      |    |      |
| 4.7                   |                       |     |     |    | 10%        |     |     |      |            |     |     |     |            | 10% | 10%  | 10%  | 10%        |     | 5%   | 5% | 3.5% |
| 6.8                   |                       |     |     |    |            |     |     |      |            |     |     |     |            | 10% | 10%  |      |            |     |      |    |      |
| 10                    |                       |     |     |    |            |     |     |      |            |     |     |     |            | 10% | 10%  | 10%  | 10%        | 10% | 5%   | 5% |      |

Percentages shown are dissipation factors





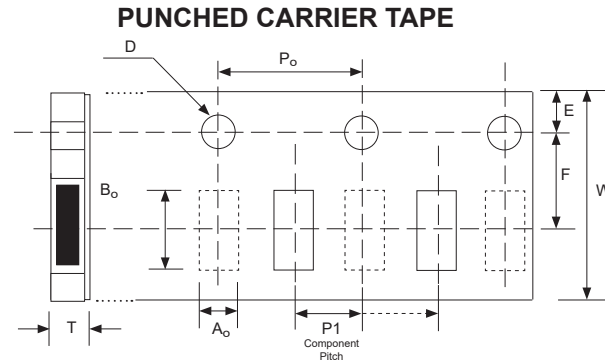
**X5R Insulation Resistance**

| Size | Capacitance | Voltage | IR Mohm (min.) | Size | Capacitance | Voltage | IR Mohm (min.) | Size | Capacitance | Voltage | IR Mohm (min.) | Size | Capacitance | Voltage | IR Mohm (min.) |
|------|-------------|---------|----------------|------|-------------|---------|----------------|------|-------------|---------|----------------|------|-------------|---------|----------------|
| 0402 | 82000       | 6.3     | 1219           | 0603 | 330000      | 6.3     | 303            | 0805 | 1500000     | 6.3     | 66             | 1206 | 4700000     | 6.3     | 21             |
| 0402 | 100000      | 6.3     | 1000           | 0603 | 680000      | 6.3     | 147            | 0805 | 2200000     | 6.3     | 45             | 1206 | 6800000     | 6.3     | 14             |
| 0402 | 150000      | 6.3     | 666            | 0603 | 820000      | 6.3     | 121            | 0805 | 3300000     | 6.3     | 30             | 1206 | 10000000    | 6.3     | 10             |
| 0402 | 220000      | 6.3     | 454            | 0603 | 1000000     | 6.3     | 100            | 0805 | 1000000     | 10      | 500            | 1206 | 1500000     | 10      | 333            |
| 0402 | 330000      | 6.3     | 303            | 0603 | 1500000     | 6.3     | 66             | 0805 | 1500000     | 10      | 333            | 1206 | 2200000     | 10      | 227            |
| 0402 | 470000      | 6.3     | 212            | 0603 | 2200000     | 6.3     | 45             | 0805 | 2200000     | 10      | 45             | 1206 | 3300000     | 10      | 151            |
| 0402 | 680000      | 6.3     | 147            | 0603 | 3300000     | 6.3     | 30             | 0805 | 3300000     | 10      | 30             | 1206 | 4700000     | 10      | 21             |
| 0402 | 1000000     | 6.3     | 100            | 0603 | 4700000     | 6.3     | 21             | 0805 | 1000000     | 16      | 500            | 1206 | 6800000     | 10      | 14             |
| 0402 | 56000       | 10      | 8928           | 0603 | 270000      | 10      | 1851           | 0805 | 1500000     | 16      | 333            | 1206 | 10000000    | 10      | 10             |
| 0402 | 68000       | 10      | 7352           | 0603 | 330000      | 10      | 1515           | 0805 | 2200000     | 16      | 45             | 1206 | 1500000     | 16      | 333            |
| 0402 | 82000       | 10      | 6097           | 0603 | 390000      | 10      | 1282           | 0805 | 3300000     | 16      | 30             | 1206 | 2200000     | 16      | 227            |
| 0402 | 100000      | 10      | 5000           | 0603 | 470000      | 10      | 212            | 0805 | 1000000     | 25      | 500            | 1206 | 3300000     | 16      | 151            |
| 0402 | 150000      | 10      | 3333           | 0603 | 680000      | 10      | 147            | 0805 | 1500000     | 25      | 333            | 1206 | 4700000     | 16      | 106            |
| 0402 | 220000      | 10      | 2272           | 0603 | 820000      | 10      | 121            | 0805 | 2200000     | 25      | 45             | 1206 | 10000000    | 16      | 10             |
| 0402 | 330000      | 10      | 1515           | 0603 | 1000000     | 10      | 100            | 0805 | 3300000     | 25      | 30             | 1206 | 2200000     | 25      | 227            |
| 0402 | 470000      | 10      | 212            | 0603 | 2200000     | 10      | 45             |      |             |         |                | 1206 | 3300000     | 25      | 151            |
| 0402 | 680000      | 10      | 147            | 0603 | 220000      | 16      | 2272           |      |             |         |                | 1206 | 4700000     | 25      | 106            |
| 0402 | 1000000     | 10      | 100            | 0603 | 270000      | 16      | 1851           |      |             |         |                | 1206 | 10000000    | 25      | 10             |
|      |             |         |                | 0603 | 330000      | 16      | 1515           |      |             |         |                |      |             |         |                |
| 0402 | 33000       | 16      | 10000          | 0603 | 390000      | 16      | 1282           |      |             |         |                | 1210 | 10000000    | 6.3     | 10             |
| 0402 | 39000       | 16      | 10000          | 0603 | 470000      | 16      | 1063           |      |             |         |                | 1210 | 1500000     | 10      | 333            |
| 0402 | 47000       | 16      | 10000          | 0603 | 680000      | 16      | 735            |      |             |         |                | 1210 | 2200000     | 10      | 227            |
| 0402 | 56000       | 16      | 8928           | 0603 | 820000      | 16      | 609            |      |             |         |                | 1210 | 4700000     | 10      | 106            |
| 0402 | 68000       | 16      | 7352           | 0603 | 1000000     | 16      | 100            |      |             |         |                | 1210 | 10000000    | 10      | 50             |
| 0402 | 82000       | 16      | 6097           | 0603 | 2200000     | 16      | 45             |      |             |         |                | 1210 | 1500000     | 16      | 333            |
| 0402 | 100000      | 16      | 5000           | 0603 | 220000      | 25      | 2272           |      |             |         |                | 1210 | 2200000     | 16      | 227            |
| 0402 | 150000      | 16      | 3333           | 0603 | 270000      | 25      | 1851           |      |             |         |                | 1210 | 4700000     | 16      | 106            |
| 0402 | 220000      | 16      | 454            | 0603 | 330000      | 25      | 1515           |      |             |         |                | 1210 | 10000000    | 16      | 50             |
| 0402 | 100000      | 25      | 5000           | 0603 | 390000      | 25      | 1282           |      |             |         |                | 1210 | 4700000     | 25      | 106            |
| 0402 | 150000      | 25      | 3333           | 0603 | 470000      | 25      | 1063           |      |             |         |                |      |             |         |                |
| 0402 | 220000      | 25      | 2272           | 0603 | 680000      | 25      | 735            |      |             |         |                |      |             |         |                |
|      |             |         |                | 0603 | 1000000     | 25      | 500            |      |             |         |                |      |             |         |                |



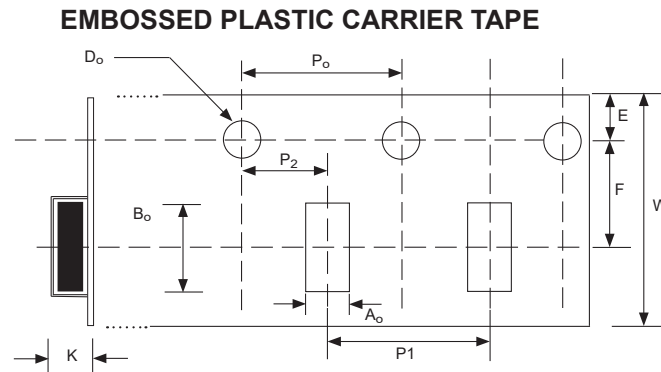
**PUNCHED CARRIER TAPE DIMENSIONS (mm)**

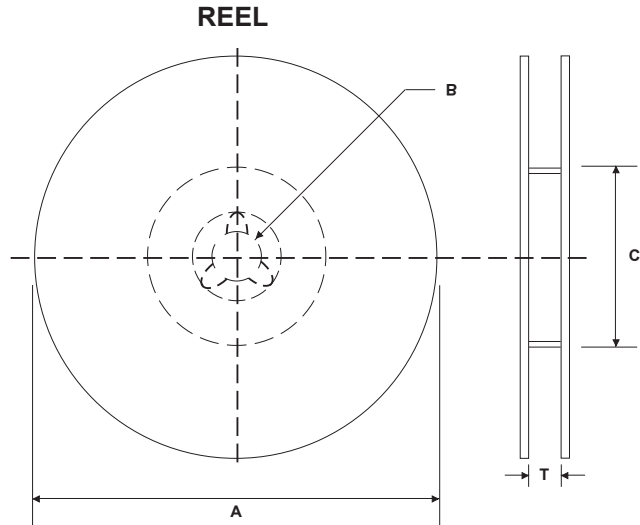
| Type | A <sub>o</sub> | B <sub>o</sub> | W         | F          | E          | P1         | P0        | D0               | T max. | Reel Quantity |
|------|----------------|----------------|-----------|------------|------------|------------|-----------|------------------|--------|---------------|
| 0402 | 0.70 ± 0.2     | 1.2 ± 0.2      | 8.0 ± 0.3 | 3.5 ± 0.05 | 1.75 ± 0.1 | 4.0 ± 0.10 | 4.0 ± 0.1 | 1.5<br>+0.1/-0.0 | 0.80   | 10K           |
| 0603 | 1.05 ± 0.3     | 1.8 ± 0.3      |           |            |            |            |           |                  | 1.2    | 4K            |
| 0805 | 1.50 ± 0.2     | 2.3 ± 0.2      |           |            |            |            |           |                  | 4K     |               |
| 1206 | 1.90 ± 0.5     | 3.5 ± 0.5      |           |            |            |            |           |                  | 4K     |               |



**EMBOSSED PLASTIC CARRIER TAPE DIMENSIONS (mm)**

| Case Size | Max. Component Thickness | A <sub>o</sub> max. | B <sub>o</sub> max. | W          | F          | E          | P <sub>0</sub> | P <sub>1</sub> | P <sub>2</sub> | D <sub>0</sub>   | K max. | Reel Quantity |            |     |    |
|-----------|--------------------------|---------------------|---------------------|------------|------------|------------|----------------|----------------|----------------|------------------|--------|---------------|------------|-----|----|
| 1206      | 1.35                     | 2.00                | 3.70                | 8.0 ± 0.3  | 3.5 ± 0.05 | 1.75 ± 0.1 | 4.0 ± 0.1      | 4.0 ± 0.10     | 2.0 ± 0.1      | 1.5<br>+0.1/-0.0 | 2.5    | 3K            |            |     |    |
|           | 2.10                     | 2.30                | 4.00                |            |            |            |                |                |                |                  |        | 2K            |            |     |    |
| 1210      | 1.35                     | 3.05                | 3.80                |            |            |            |                |                |                |                  |        | 5.5 ± 0.1     | 4.0 ± 0.10 | 2.5 | 3K |
|           | 2.20                     |                     |                     |            |            |            |                |                |                |                  |        |               |            |     |    |
| 1808      | 2.20                     | 2.50                | 5.30                | 12.0 ± 0.3 | 5.5 ± 0.05 | 4.0 ± 0.10 | 8.0 ± 0.10     | 2.5            | 1K             | 3.2              | 1K     |               |            |     |    |
| 1812      | 2.20                     | 3.90                | 5.30                |            |            |            |                |                |                |                  | 2.5    | 1K            |            |     |    |
| 1825      | 2.20                     |                     |                     | 6.80       | 5.30       | 3.5        | 500            |                |                |                  |        |               |            |     |    |
|           | 3.10                     | 2.5                 | 1K                  |            |            |            |                |                |                |                  |        |               |            |     |    |
| 2220      | 2.20                     | 5.80                | 6.50                | 2.5        | 1K         |            |                |                |                |                  |        |               |            |     |    |
|           | 3.10                     |                     |                     |            |            | 3.5        | 500            |                |                |                  |        |               |            |     |    |
| 2225      | 2.20                     | 6.80                | 6.50                | 2.5        | 1K         |            |                |                |                |                  |        |               |            |     |    |
|           | 3.10                     |                     |                     |            |            | 3.5        | 500            |                |                |                  |        |               |            |     |    |



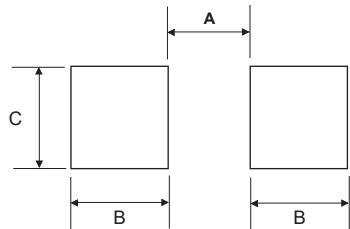


**REEL DIMENSIONS (mm)**

| Reel Diameter (A) | B              | C         | T max.        |
|-------------------|----------------|-----------|---------------|
| 7" (178 ± 1.0)    | 13.0 +0.5/-0.2 | 60 +1/-0  | 8.4 +1.5/-0   |
| 10" (250 ± 1.0)   |                | 100 ± 1.0 | (1808~2225)   |
| 13" (330 ± 1.0)   |                | 100 ± 1.0 | 12.4 +2.0/-0) |

**LAND PATTERN DIMENSIONS (mm)**

| Dimension | 0402 | 0603 | 0805 | 1206 | 1210 | 1808 | 1812 | 1825 | 2220 | 2225 |
|-----------|------|------|------|------|------|------|------|------|------|------|
| A         | 0.40 | 0.70 | 1.00 | 2.20 | 2.20 | 3.30 | 3.50 | 3.50 | 4.30 | 4.30 |
| B         | 0.50 | 0.80 | 0.90 | 0.90 | 0.90 | 1.05 | 0.90 | 0.90 | 1.35 | 1.35 |
| C         | 0.50 | 0.80 | 1.30 | 1.60 | 2.50 | 2.30 | 3.80 | 6.50 | 5.00 | 6.50 |



[Link to Reflow Soldering Profile](#)