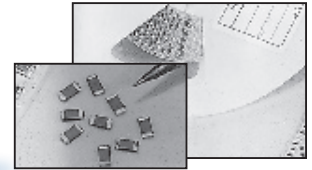


FEATURES

- CLASS II DIELECTRIC, TEMPERATURE STABLE
- EXCELLENT FREQUENCY CHARACTERISTICS, NON-LINEAR CAPACITANCE CHANGE
- HIGHER CAPACITANCE THAN NPO
- NICKEL BARRIER TERMINATIONS AND EXCELLENT MECHANICAL STRENGTH

**RoHS
Compliant**

Includes all homogeneous materials

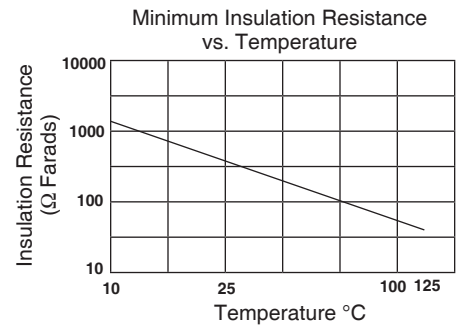
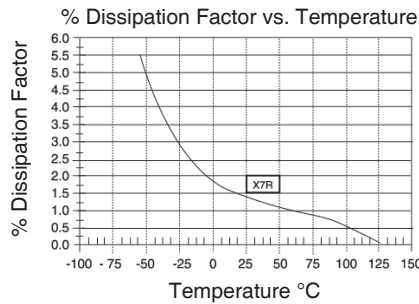
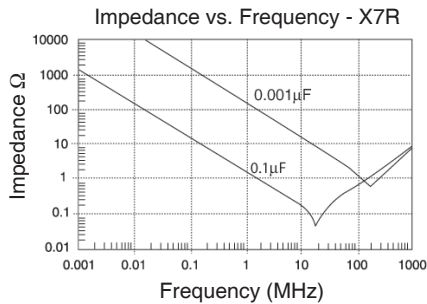
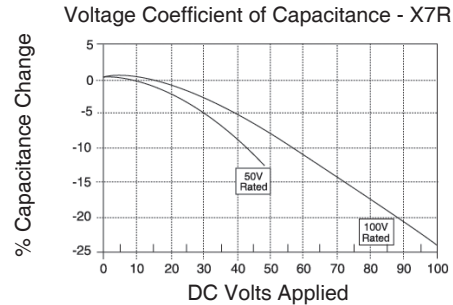
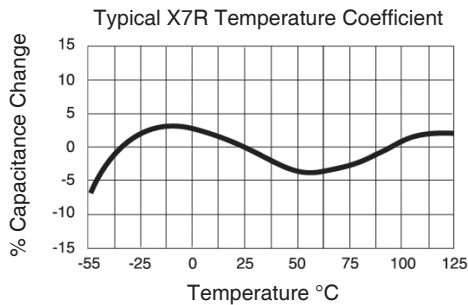


*See Part Number System for Details

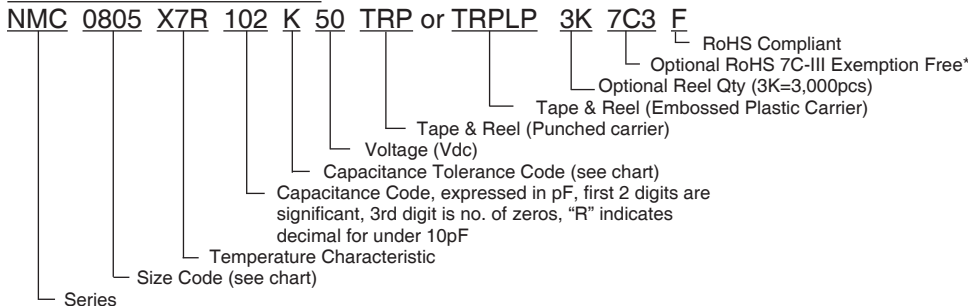
SPECIFICATIONS

| | |
|---------------------------------|---|
| Capacitance Range | 47pF ~ 0.82μF (see high CV datasheet for higher capacitance values) |
| Capacitance Tolerance | ±5% (J), ±10% (K), ±20% (M) |
| Operating Temperature Range | -55°C ~ +125°C |
| Temperature Characteristics | ±15%Δ max. over temperature range (with 0 Vdc applied) |
| Rated Voltages | 10Vdc, 16Vdc, 25Vdc, 35Vdc, 50Vdc (see NMC-H Series for higher voltages) |
| Dissipation Factor | 2.5% max. (50Vdc, 100Vdc); 3.5% max. (16Vdc, 25Vdc) 5% max. (10Vdc) @ 1.0Vrms and 1KHz, +25°C |
| Insulation Resistance | 10,000Megohms min. or 500Megohm/μF min. whichever is less @ +25°C |
| Dielectric Withstanding Voltage | 250% of Rated Voltage for 1 ~ 5 seconds, 50mA maximum current |
| Test Conditions (EIA-198-2E) | 1KHz, 1.0V ±0.2Vrms |

Note: Reflow soldering allowed for all case sizes. Contact NIC for wave soldering restrictions.



PART NUMBER SYSTEM



* - Part Number Level Identification of X7R MLCCs that do not take RoHS exemption 7C-III



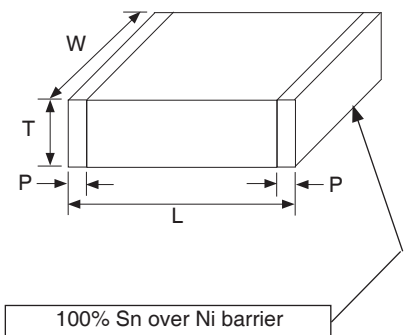
X7R CAPACITOR SIZE CHART (mm)

| EIA Case Size | 0201 | | | 0402 | | | 0603 | | | | 0805 | | | | | | |
|-----------------------|-----------------------|----|----|----------|----|----|-------------|----|----|----|-------------|-----|----|----|----|----|-----|
| Length (L) | 0.6±0.03 | | | 1.0±0.05 | | | 1.6±0.15 | | | | 2.0±0.2 | | | | | | |
| Width (W) | 0.3±0.03 | | | 0.5±0.05 | | | 0.8±0.15 | | | | 1.25±0.2 | | | | | | |
| Thickness max. (T) | 0.33 | | | 0.6 | | | 1.0 | | | | 1.35 | | | | | | |
| Termination Width (P) | 0.15±0.05 | | | 0.2±0.1 | | | 0.12 ~ 0.51 | | | | 0.25 ~ 0.71 | | | | | | |
| Capacitance | Working Voltage (Vdc) | | | | | | | | | | | | | | | | |
| | 16 | 25 | 50 | 10 | 16 | 25 | 50 | 10 | 16 | 25 | 50 | 100 | 10 | 16 | 25 | 50 | 100 |
| 47pF ~ 91pF | | | | | | | | | | | | | | | | | |
| 100pF ~ 470pF | | | | | | | | | | | | | | | | | |
| 510pF | | | | | | | | | | | | | | | | | |
| 560pF | | | | | | | | | | | | | | | | | |
| 620pF | | | | | | | | | | | | | | | | | |
| 680pF | | | | | | | | | | | | | | | | | |
| 750pF | | | | | | | | | | | | | | | | | |
| 820pF | | | | | | | | | | | | | | | | | |
| 910pF | | | | | | | | | | | | | | | | | |
| 0.001µF | | | | | | | | | | | | | | | | | |
| 0.0012µF | | | | | | | | | | | | | | | | | |
| 0.0015µF | | | | | | | | | | | | | | | | | |
| 0.0018µF | | | | | | | | | | | | | | | | | |
| 0.0022µF | | | | | | | | | | | | | | | | | |
| 0.0027µF | | | | | | | | | | | | | | | | | |
| 0.0030µF | | | | | | | | | | | | | | | | | |
| 0.0033µF | | | | | | | | | | | | | | | | | |
| 0.0039µF | | | | | | | | | | | | | | | | | |
| 0.0047µF | | | | | | | | | | | | | | | | | |
| 0.0056µF | | | | | | | | | | | | | | | | | |
| 0.0068µF | | | | | | | | | | | | | | | | | |
| 0.0075µF | | | | | | | | | | | | | | | | | |
| 0.0082µF | | | | | | | | | | | | | | | | | |
| 0.01µF | | | | | | | | | | | | | | | | | |
| 0.012µF | | | | | | | | | | | | | | | | | |
| 0.015µF | | | | | | | | | | | | | | | | | |
| 0.018µF | | | | | | | | | | | | | | | | | |
| 0.022µF | | | | | | | | | | | | | | | | | |
| 0.033µF | | | | | | | | | | | | | | | | | |
| 0.039µF | | | | | | | | | | | | | | | | | |
| 0.047µF | | | | | | | | | | | | | | | | | |
| 0.056µF | | | | | | | | | | | | | | | | | |
| 0.068µF | | | | | | | | | | | | | | | | | |
| 0.082µF | | | | | | | | | | | | | | | | | |
| 0.1µF | | | | | | | | | | | | | | | | | * |
| 0.15µF | | | | | | | | | | | | | | * | * | * | |
| 0.18µF | | | | | | | | | | | | | | * | * | * | |
| 0.22µF | | | | | | | | | | | | | | * | * | * | |
| 0.33µF | | | | | | | | | | | | | | * | * | * | |
| 0.39µF | | | | | | | | | | | | | * | * | * | * | |
| 0.47µF | | | | | | | | | | | | | * | * | * | * | |
| 0.56µF | | | | | | | | | | | | | * | * | * | * | |
| 0.68µF | | | | | | | | | | | | | * | * | * | * | |
| 0.82µF | | | | | | | | | | | | | * | * | * | * | |

*1.45mm maximum thickness

(CONSULT FACTORY FOR CAPACITANCE VALUES NOT LISTED)

See NMC High CV series for values above 0.82µF



X7R CAPACITOR SIZE CHART (mm)

| EIA Case Size | 1206 | | | | | 1210 | | | | | 1812 | | | | | 2225 | | | |
|-----------------------|-----------------------|----|----|----|-----|-----------|----|----|----|----|-------------|----|----|----|----|-------------|----|----|-----|
| Length (L) | 3.2±0.2 | | | | | 3.2±0.2 | | | | | 4.5±0.3 | | | | | 5.7±0.4 | | | |
| Width (W) | 1.6±0.2 | | | | | 2.5±0.2 | | | | | 3.2±0.25 | | | | | 6.35±0.25 | | | |
| Thickness max. (T) | 1.80 | | | | | 1.80 | | | | | 1.8 | | | | | 1.80 | | | |
| Termination Width (P) | 0.25 ~ 0.71 | | | | | 0.25~0.75 | | | | | 0.25 ~ 0.75 | | | | | 0.25 ~ 1.02 | | | |
| Capacitance | Working Voltage (Vdc) | | | | | | | | | | | | | | | | | | |
| | 10 | 16 | 25 | 50 | 100 | 10 | 16 | 25 | 35 | 50 | 100 | 10 | 16 | 25 | 50 | 100 | 25 | 50 | 100 |
| 150pF ~ 910pF | | | | | | | | | | | | | | | | | | | |
| 0.001 | | | | | | | | | | | | | | | | | | | |
| 0.0012µF | | | | | | | | | | | | | | | | | | | |
| 0.0015µF | | | | | | | | | | | | | | | | | | | |
| 0.0018µF | | | | | | | | | | | | | | | | | | | |
| 0.0022µF | | | | | | | | | | | | | | | | | | | |
| 0.0027µF | | | | | | | | | | | | | | | | | | | |
| 0.0033µF | | | | | | | | | | | | | | | | | | | |
| 0.0036µF | | | | | | | | | | | | | | | | | | | |
| 0.0039µF | | | | | | | | | | | | | | | | | | | |
| 0.0043µF | | | | | | | | | | | | | | | | | | | |
| 0.0047µF | | | | | | | | | | | | | | | | | | | |
| 0.0056µF | | | | | | | | | | | | | | | | | | | |
| 0.0068µF | | | | | | | | | | | | | | | | | | | |
| 0.0075µF | | | | | | | | | | | | | | | | | | | |
| 0.0082µF | | | | | | | | | | | | | | | | | | | |
| 0.01µF | | | | | | | | | | | | | | | | | | | |
| 0.012µF | | | | | | | | | | | | | | | | | | | |
| 0.015µF | | | | | | | | | | | | | | | | | | | |
| 0.018µF | | | | | | | | | | | | | | | | | | | |
| 0.022µF | | | | | | | | | | | | | | | | | | | |
| 0.027µF | | | | | | | | | | | | | | | | | | | |
| 0.033µF | | | | | | | | | | | | | | | | | | | |
| 0.036µF | | | | | | | | | | | | | | | | | | | |
| 0.039µF | | | | | | | | | | | | | | | | | | | |
| 0.043µF | | | | | | | | | | | | | | | | | | | |
| 0.047µF | | | | | | | | | | | | | | | | | | | |
| 0.056µF | | | | | | | | | | | | | | | | | | | |
| 0.068µF | | | | | | | | | | | | | | | | | | | |
| 0.082µF | | | | | | | | | | | | | | | | | | | |
| 0.1µF | | | | | | | | | | | | | | | | | | | |
| 0.12µF | | | | | | | | | | | | | | | | | | | |
| 0.15µF | | | | | | | | | | | | | | | | | | | |
| 0.18µF | | | | | | | | | | | | | | | | | | | |
| 0.22µF | | | | | | | | | | | | | | | | | | | |
| 0.27µF | | | | | | | | | | | | | | | | | | | |
| 0.33µF | | | | | | | | | | | | | | | | | | | |
| 0.39µF | | | | | | | | | | | | | | | | | | | |
| 0.47µF | | | | | | | | | | | | | | | | | | | |
| 0.56µF | | | | | | | | | | | | | | | | | | | |
| 0.68µF | | | | | | | | | | | | | | | | | | | |
| 0.82µF | | | | | | | | | | | | | | | | | | * | * |

* 2.20mm maximum thickness

See NMC High CV series for values above 0.82µF





REEL DIMENSIONS (mm)

| Reel Diameter (A) | B | C | D | T max. |
|-------------------|----------|-----------|----------|---|
| 7" (178 ± 2.0) | 13 ± 0.5 | 50 min. | 21 ± 1.0 | 8.4 +1.0/-0 (1812 case size 12.4 +2.0/-0) |
| 10" (250 ± 2.0) | | 100 ± 1.0 | | |
| 13" (330 ± 2.0) | | 100 ± 1.0 | | |

7 INCH REEL QUANTITIES*

| Size | 01005 | 0201 | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 |
|-------------------|--------|--------|--------|-------|-------|-------|-------|-------|
| Tape Size | 8mm | 8mm | 8mm | 8mm | 8mm | 8mm | 8mm | 12mm |
| Min. Qty Per Reel | 20,000 | 20,000 | 10,000 | 4,000 | 4,000 | 4,000 | 2,000 | 1,000 |
| Max. Qty Per Reel | 20,000 | 20,000 | 10,000 | 4,000 | 5,000 | 5,000 | 5,000 | 2,000 |

*Quantity dependent on chip thickness. Contact NIC for reel quantities on larger diameter reels.

CARRIER TAPE MATERIAL

Parts with a thickness of $\geq 1\text{mm}$ will be taped on embossed plastic carrier. Parts with a thickness of less than 1mm will be taped on paper carrier

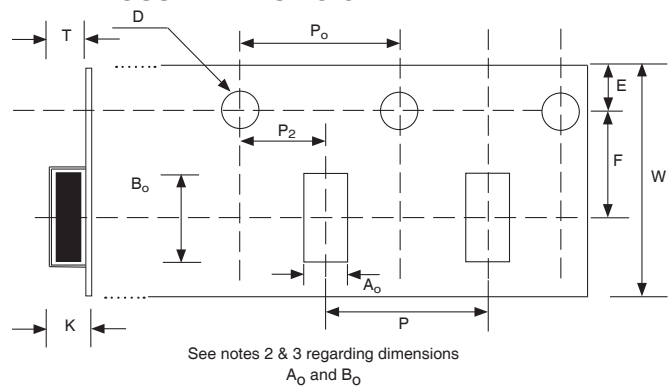
EMBOSSED PLASTIC CARRIER TAPE DIMENSIONS (mm)

| Tape Size | W | F | E | P ₀ | P ₂ | D | K max. | T max. | P |
|-----------|-----------|------------|-------------|----------------|----------------|-------------------------------------|--------|--------|-----------|
| 8mm | 8.0 ± 0.2 | 3.5 ± 0.05 | 1.75 ± 0.10 | 4.0 ± 0.1 | 2.0 ± 0.5 | 1.5 ^{+0.1} _{-0.0} | 3.0 | 2.0 | 4.0 ± 0.1 |
| 12mm | 12 ± 0.2 | 5.5 ± 0.05 | | | | | | 4.5 | 8.0 ± 0.1 |

Notes:

- Specifications are in compliance with EIA RS481-1-A "Taping of surface Mount Components for Automatic Placement"
- Dimensions A₀ (max.) equals component width dimension plus 0.5mm
- Dimension B₀ (max.) equals component length dimension plus 0.5mm

EMBOSSED PLASTIC CARRIER TAPE

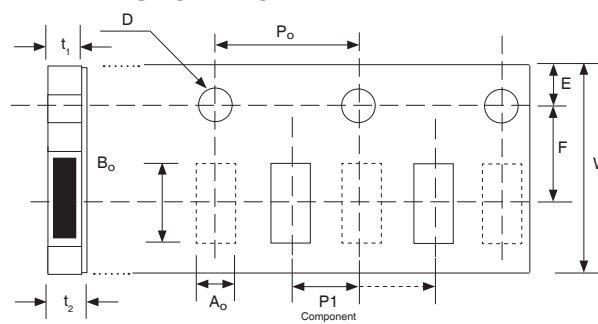


See notes 2 & 3 regarding dimensions A₀ and B₀

PUNCHED CARRIER TAPE DIMENSIONS (mm)

| Type | A ₀ | B ₀ | W | F | E | P1 | P0 | D0 | T1 max. | T2 max. | Mounting Hole |
|-------|----------------|----------------|-----------|------------|------------|------------|-----------|-------------------------------------|---------|---------|--------------------|
| 01005 | 0.25 ± 0.04 | 0.45 ± 0.04 | 8.0 ± 0.3 | 3.5 ± 0.05 | 1.75 ± 0.1 | 2.0 ± 0.05 | 4.0 ± 0.1 | 1.5 ^{+0.1} _{-0.0} | 0.27 | 0.36 | Angular Punch Hole |
| 0201 | 0.37 ± 0.03 | 0.67 ± 0.05 | | | | 4.0 ± 0.10 | | | 0.45 | 0.80 | |
| 0402 | 0.65 ± 0.05 | 1.15 ± 0.05 | | | | | | | | | |
| 0603 | 1.1 ± 0.2 | 1.9 ± 0.2 | | | | | | | | | |
| 0805 | 1.65 ± 0.2 | 2.4 ± 0.2 | | | | | | | | | |
| 1206 | 2.0 ± 0.2 | 3.6 ± 0.2 | | | | | | | | | |

PUNCHED CARRIER TAPE



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