

Multilayer Ceramic Chip Capacitors

NMC-P Series

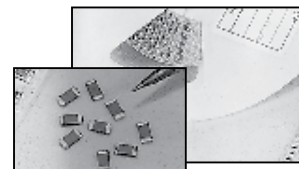
FEATURES

- CRACK RESISTANT TERMINATION
- SOFT TERMINATION, OPEN MODE FAILURE
- WIDE VOLTAGE RANGE (4V TO 5KV)
- HIGH CAPACITANCE (UP TO 100μF)
- RoHS COMPLIANT
- SAC SOLDER COMPATIBLE**

RoHS Compliant

Includes all homogeneous materials

*See Part Number System for Details



Temperature Coefficient	NPO	X7R	X5R
Capacitance Range	5pF ~ 0.22μF	180pF ~ 10μF	22μF ~ 100μF
Capacitance Tolerance	For 2.2pF ~ 10pF: ±0.1pF (B), ±0.25pF (C), ±0.5pF (D), ±1pF (F) Above 10pF: ±1% (F), ±2% (G), ±5% (J), ±10% (K)	±10% (K) & ±20% (M)	±20% (M)
Operating Temperature Range	-55°C ~ +125°C		-55°C ~ +85°C
Temperature Characteristics	±30ppm/°C		±15% Δ Cap.
Rated Voltages	16Vdc, 25Vdc, 50Vdc, 100Vdc, 200Vdc, 250Vdc, 500Vdc, 630Vdc, 1KVdc, 2KVdc, 3KVdc & 5KVdc		4Vdc, 6.3Vdc, 10Vdc, 16Vdc, 25Vdc
Q or Dissipation Factor	Q = ≥ 1000 (more than 30pF)* Q = ≥ 400 + 20 x C in pF (30pF and below)*	2.5% max. @ 1KHz, 1.0V ± 0.2Vrms	10% max. @ 120Hz, 0.5V ± 0.1Vrms
Insulation Resistance	10,000Megohm or 500Megohm/μF whichever is less @ +25°C		22μF & 47μF 100Megohm/μF @ +25°C 100μF 50Megohm/μF @ +25°C
Dielectric Withstanding Voltage	200% of rated voltage for 5 seconds, 50mA max. (16V ~ 250V) 150% of rated voltage for 5 seconds, 50mA max. (500V ~ 630V) 120% of rated voltage for 5 seconds, 50mA max. (1KV ~ 5KV)		250% of rated voltage for 5 seconds, 50mA max.

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

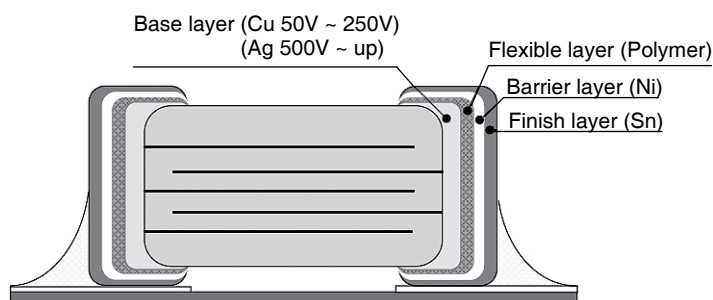
**Reflow soldering is recommended. Contact NIC regarding the use of other soldering methods.

PART NUMBER SYSTEM

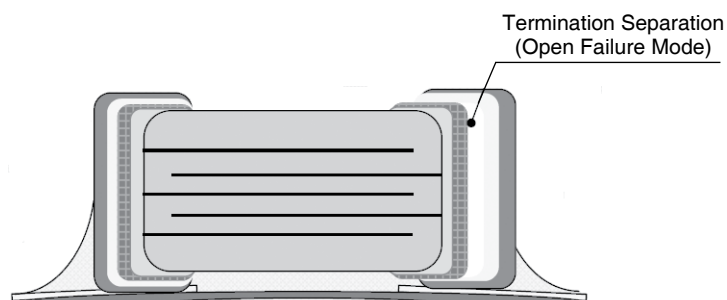
NMC-P 1206 X7R 105 K 50 TRP or TRPLP E

NMC-P: Series
 1206: Size Code (see chart)
 X7R: Temperature Characteristic (NPO, X7R or X5R)
 105: Capacitance Code, expressed in pF, first 2 digits are significant, 3rd digit is no. of zeros
 K: Capacitance Tolerance Code (see chart)
 50: Voltage (Vdc)
 TRP or TRPLP: Tape & Reel (Plastic Carrier) / Tape & Reel (Punched Carrier)
 E: RoHS Compliant

CONSTRUCTION



OPEN MODE FAILURE AS A RESULT OF BENDING STRESS



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NPO VALUES AND SIZES (mm)

EIA Case Size	0603				0805				1206								1210							
Length (L)	1.60 ± 0.1				2.00 ± 0.2				3.20 ± 0.3								3.20 ± 0.30							
Width (W)	0.80 ± 0.1				1.25 ± 0.25				1.60 ± 0.2								2.50 ± 0.20							
Thickness max. (T)	0.90 max.				1.45 max.				1.80 max.								2.60 max.							
Termination Width (P)	0.15 min.				0.20 min.				0.30 min.								0.30 min.							
Capacitance	Working Voltage (Vdc)																							
	200	16	25	50	200	250	500	16	25	50	200	250	500	1K	2K	3K	16	25	50	200	250	500		
5.0																								
8.2																								
10																								
12																								
15																								
18																								
22																								
27																								
33																								
39																								
47																								
56																								
68																								
82																								
100																								
120																								
150																								
180																								
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0.001μF																								
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0.033																								
0.039																								
0.047																								
0.056																								
0.068																								
0.1μF																								

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NPO VALUES AND SIZES (mm)

EIA Case Size		1808					1812					1825			2220		
Length (L)		4.60 ± 0.3					4.60 ± 0.3					4.60 ± 0.3			5.70 ± 0.4		
Width (W)		2.00 ±0.2					3.20 ±0.3					6.35 ±0.4			5.00 ±0.4		
Thickness max. (T)		2.20 max.					3.00 max.					2.60 max.			3.00 max.		
Termination Width (P)		0.30 min.					0.30 min.					0.30 min.			0.30 min.		
Capacitance	Working Voltage (Vdc)																
	1K	2K	3K	5K	16	25	50	1K	2K	3K	250	500	1K	1K	5K		
5.0																	
8.2																	
10																	
12																	
15																	
18																	
22																	
27																	
33																	
39																	
47																	
56																	
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0.0068																	
0.0082																	
0.01μF																	
0.012																	
0.015																	
0.018																	
0.022																	
0.027																	
0.033																	
0.039																	
0.047																	
0.056																	
0.068																	
0.1μF																	
0.12																	
0.15																	
0.22																	

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X7R LOW VOLTAGE VALUES AND SIZES (mm)

EIA Case Size	0805		1206		1210		1812		1825		2220		2225	
Length (L)	2.00 ± 0.2		3.20 ± 0.3		3.20 ± 0.3		4.60 ± 0.3		4.60 ± 0.3		5.70 ± 0.4		5.70 ± 0.4	
Width (W)	1.25 ± 0.25		1.60 ± 0.2		2.50 ± 0.2		3.20 ± 0.3		6.35 ± 0.4		5.00 ± 0.4		6.35 ± 0.4	
Thickness max. (T)	1.45 max.		1.80 max.		2.60 max.		3.00 max.		2.60 max.		3.00 max.		3.00 max.	
Termination Width (P)	0.20 min.		0.30 min.		0.30 min.		0.30 min.		0.30 min.		0.30 min.		0.30 min.	
Capacitance	Working Voltage (Vdc)													
	50	100	50	100	50	100	50	100	50	100	50	100	50	100
0.1µF														
0.15														
0.22														
0.33														
0.47														
0.68														
1.0µF														
1.5														
2.2														
3.3														
4.7														
6.8														
10µF														

X7R HIGH VOLTAGE VALUES AND SIZES (mm)

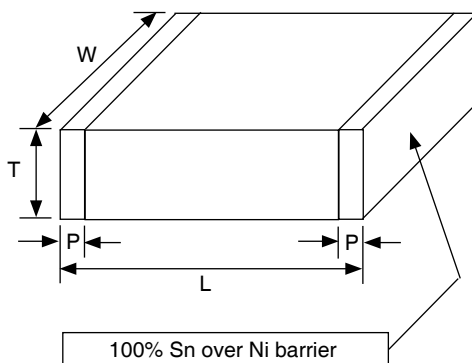
EIA Case Size	0805			1206					1210			
Length (L)	2.00 ± 0.2			3.20 ± 0.3					3.20 ± 0.3			
Width (W)	1.25 ± 0.25			1.60 ± 0.2					2.50 ± 0.2			
Thickness max. (T)	1.45 max.			1.80 max.					2.60 max.			
Termination Width (P)	0.20 min.			0.30 min.					0.30 min.			
Capacitance	Working Voltage (Vdc)											
	200	250	500	200	250	500	630	1K	200	250	500	1K
180pF												
220												
270												
330												
390												
470												
560												
680												
0.001µF												
0.0015µF												
0.0022µF												
0.0027µF												
0.0033µF												
0.0039µF												
0.0047µF												
0.0056µF												
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0.033µF												
0.039µF												
0.047µF												
0.056µF												
0.068µF												
0.1µF												
0.12µF												
0.15µF												
0.18µF												
0.22µF												

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X7R HIGH VOLTAGE VALUES AND SIZES (mm)

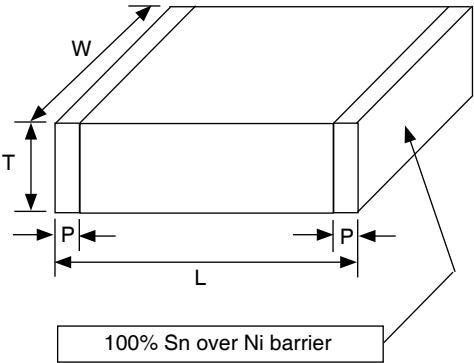
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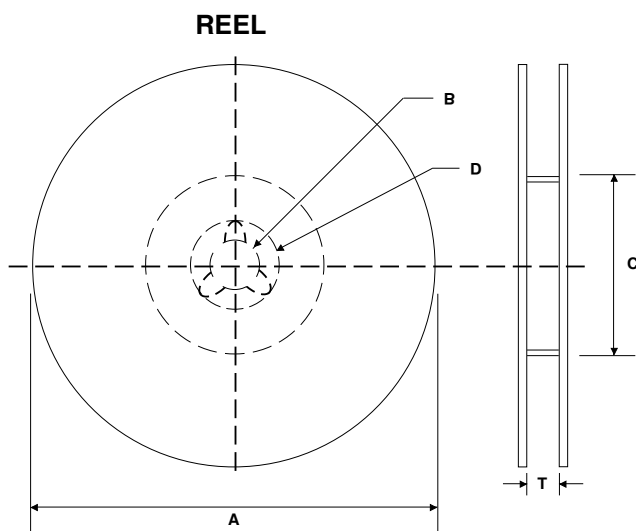
Multilayer Ceramic Chip Capacitors

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X5R HIGH CAPACITANCE VALUES AND SIZES (mm)

EIA Case Size	0805				1206				
Length (L)	2.0 ± 0.15				3.2 ± 0.2				
Width (W)	1.25 ± 0.15				1.6 ± 0.2				
Thickness max. (T)	1.25 ± 0.15				1.6 ± 0.2				
Termination Width (P)	0.5 +0.2/-0.3				0.5 ± 0.3				
Capacitance	Working Voltage								
	6.3	10	16	25	4	6.3	10	16	25
22µF									
47µF									
100µF									





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	0603	0805	1206	1210	1812
Tape Size	8mm	8mm	8mm	8mm	12mm
Min. Qty Per Reel	4,000	4,000	4,000	2,000	1,000
Max. Qty Per Reel	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 ≥1mm will be taped on embossed plastic carrier. Parts with a thickness of less than 1mm will be taped on paper carrier

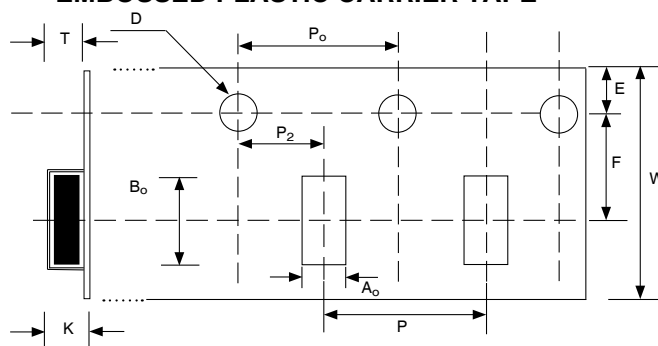
EMBOSSED PLASTIC CARRIER TAPE DIMENSIONS (mm)

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

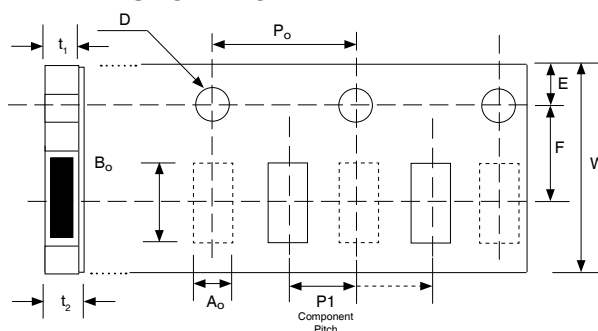


See notes 2 & 3 regarding dimensions A₀ and B₀

PUNCHED CARRIER TAPE DIMENSIONS (mm)

Type	A ₀	B ₀	W	F	E	P1	P0	D0	T1 max.	T2 max.	Mounting Hole
0603	1.1 ± 0.2	1.9 ± 0.2	8.0 ± 0.3	3.5 ± 0.05	1.75 ± 0.1	4.0 ± 0.10	4.0 ± 0.1	1.5 ^{+0.1/-0.0}	1.1	1.4	Angular Punch Hole
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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