

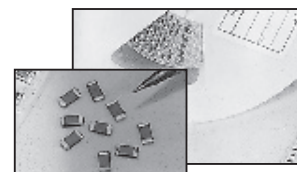
FEATURES

- CRACK RESISTANT TERMINATION
- SOFT TERMINATION, OPEN MODE FAILURE
- WIDE VOLTAGE RANGE (16V TO 3KV)
- HIGH CAPACITANCE (UP TO 10 μ F)
- RoHS COMPLIANT
- SAC SOLDER COMPATIBLE**

RoHS Compliant

Includes all homogeneous materials

*See Part Number System for Details



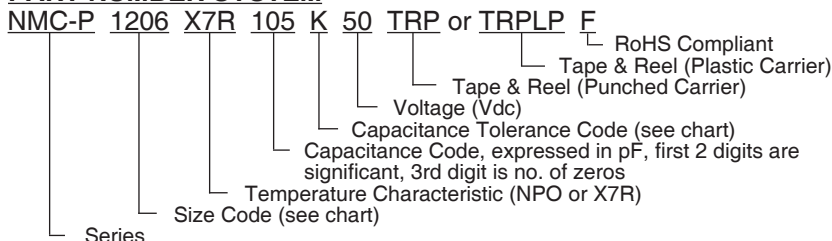
SPECIFICATIONS

Temperature Coefficient	NPO	X7R
Capacitance Range	5pF ~ 0.22 μ F	180pF ~ 10 μ F
Capacitance Tolerance	For 2.2pF ~ 10pF: ± 0.1 pF (B), ± 0.25 pF (C), ± 0.5 pF (D), ± 1 pF (F) Above 10pF: $\pm 1\%$ (F), $\pm 2\%$ (G), $\pm 5\%$ (J), $\pm 10\%$ (K)	$\pm 10\%$ (K) & $\pm 20\%$ (M)
Operating Temperature Range	-55°C ~ +125°C	
Temperature Characteristics	± 30 ppm/°C	$\pm 15\%$ Δ Cap.
Rated Voltages	16Vdc, 25Vdc, 50Vdc, 100Vdc, 200Vdc, 250Vdc, 500Vdc, 630Vdc, 1KVdc, 2Kvdc & 3Kvdc	
Q or Dissipation Factor	Q = ≥ 1000 (more than 30pF)* Q = $\geq 400 + 20 \times C$ in pF (30pF and below)*	2.5% max. @ 1KHz, 1.0V $\pm$ 0.2Vrms
Insulation Resistance	10,000Megohm or 500Megohm/ μ F whichever is less @ +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 ~ 3KV)	

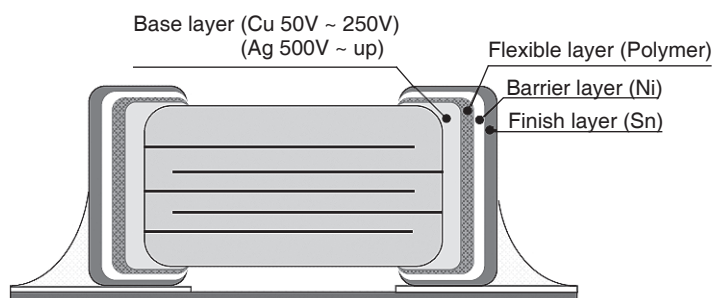
*Test Frequency & Voltage: Up to 100pF 1MHz/1.0Vrms, Above 100pF 1KHz/1.0Vrms

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

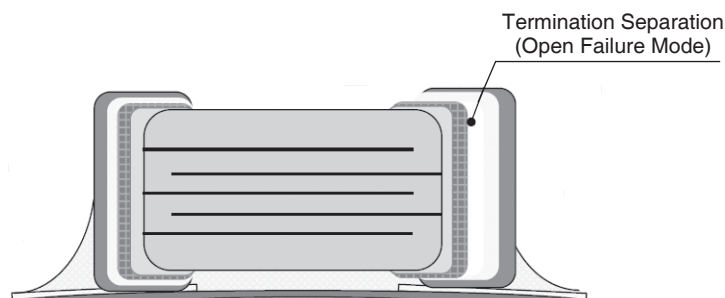
PART NUMBER SYSTEM



CONSTRUCTION



OPEN MODE FAILURE AS A RESULT OF BENDING STRESS



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	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																					
220																					
270																					
330																					
390																					
470																					
560																					
680																					
820																					
0.001μF																					
0.0012																					
0.0015																					
0.0018																					
0.0022																					
0.0027																					
0.0033																					
0.0039																					
0.0047																					
0.0056																					
0.0068																					
0.0082																					
0.01μF																					
0.012																					
0.015																					

NPO VALUES AND SIZES (mm)

EIA Case Size	1808			1812				
Length (L)	4.60 ± 0.3			4.60 ± 0.3				
Width (W)	2.00 ±0.2			3.20 ±0.3				
Thickness max. (T)	2.20 max.			3.00 max.				
Termination Width (P)	0.30 min.			0.30 min.				
Capacitance	Working Voltage (Vdc)							
	1K	2K	3K	16	25	50	1K	2K
5.0								
8.2								
10								
12								
15								
18								
22								
27								
33								
39								
47								
56								
68								
82								
100								
120								
150								
180								
220								
270								
330								
390								
470								
560								
680								
820								
0.001μF								
0.0012								
0.0015								
0.0018								
0.0022								
0.0027								
0.0033								
0.0039								
0.0047								
0.0056								
0.0068								
0.0082								
0.01μF								
0.012								
0.015								
0.018								
0.022								
0.027								
0.033								

X7R LOW VOLTAGE VALUES AND SIZES (mm)

EIA Case Size	0603			0805			1206				1210		1812		1825		2220		2225	
Length (L)	1.60 ± 0.1			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)	0.80 ± 0.1			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)	0.90 max.			1.45 max.			1.80 max.				2.60 max.		3.00 max.		2.60 max.		3.00 max.		3.00 max.	
Termination Width (P)	0.15 min.			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)																			
	16	50	16	25	50	100	16	25	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																				

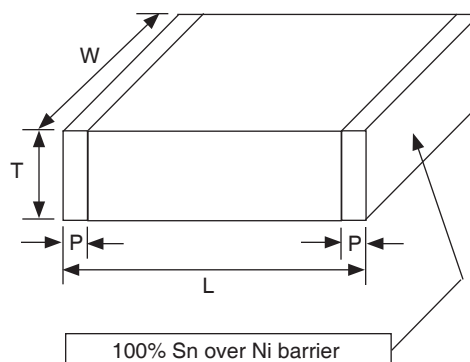
X7R HIGH VOLTAGE VALUES AND SIZES (mm)

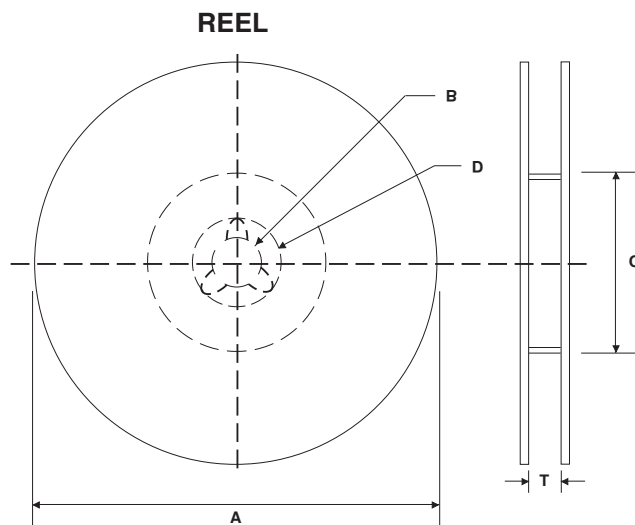
EIA Case Size	0805			1206					1210			
Length (L)	2.00 ± 0.2			3.20 ± 0.3					3.20 ± 0.3			
Width (W)	1.25 ± 0.25			1.60 ± 0.2					2.50 ± 0.2			
Thickness max. (T)	1.45 max.			1.80 max.					2.60 max.			
Termination Width (P)	0.20 min.			0.30 min.					0.30 min.			
Capacitance	Working Voltage (Vdc)											
	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												
0.0068µF												
0.01µF												
0.012µF												
0.015µF												
0.018µF												
0.022µF												
0.027µF												
0.033µF												
0.039µF												
0.047µF												
0.056µF												
0.068µF												
0.1µF												
0.12µF												
0.15µF												
0.18µF												
0.22µF												



X7R HIGH VOLTAGE VALUES AND SIZES (mm)

EIA Case Size	1808				1812						1825			2220				2225		
Length (L)	4.60 ± 0.3				4.60 ± 0.3						4.60 ± 0.3			5.70 ± 0.4				5.70 ± 0.4		
Width (W)	2.0 ± 0.2				3.2 ± 0.3						6.35 ± 0.4			5.00 ± 0.4				6.35 ± 0.4		
Thickness max. (T)	2.20 max.				3.00 max.						2.60 max.			3.00 max.				3.00 max.		
Termination Width (P)	0.30 min.				0.30 min.						0.30 min.			0.30 min.				0.30 min.		
Capacitance	Working Voltage (Vdc)																			
	500	1K	2K	3K	200	250	500	1K	2K	3K	250	500	1K	250	500	1K	2K	250	500	
150pF																				
180																				
220																				
270																				
330																				
390																				
470																				
560																				
680																				
0.001μF																				
0.0015																				
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0.27																				
0.33																				
0.39																				
0.47																				
0.56																				
0.68																				
1.0μF																				





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

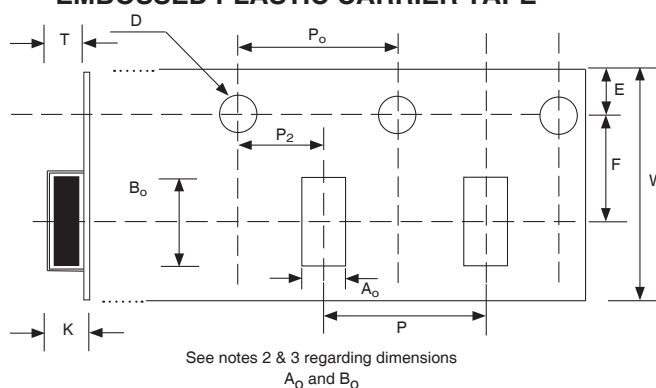
EMBOSSED PLASTIC CARRIER TAPE DIMENSIONS (mm)

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



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

