

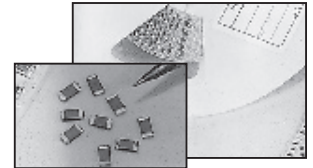
FEATURES

- CRACK RESISTANT TERMINATION
- SOFT TERMINATION, OPEN MODE FAILURE
- WIDE VOLTAGE RANGE (16V TO 5KV)
- HIGH CAPACITANCE (UP TO 10 μ F)
- RoHS COMPLIANT
- SAC SOLDER COMPATIBLE**

RoHS Compliant

Includes all homogeneous materials

*See Part Number System for Details

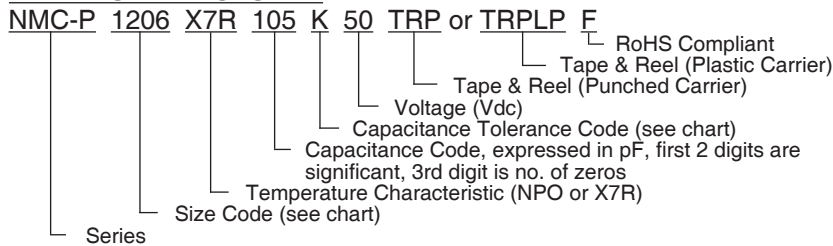


Temperature Coefficient	NPO	X7R
Capacitance Range	5pF ~ 0.22 μ F	180pF ~ 10 μ F
Capacitance Tolerance	For 2.2pF ~ 10pF: ± 0.1 pF (B), ± 0.25 pF (C), ± 0.5 pF (D), ± 1 pF (F) Above 10pF: $\pm 1\%$ (F), $\pm 2\%$ (G), $\pm 5\%$ (J), $\pm 10\%$ (K)	$\pm 10\%$ (K) & $\pm 20\%$ (M)
Operating Temperature Range	-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 & 5Kvdc	
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 ~ 5KV)	

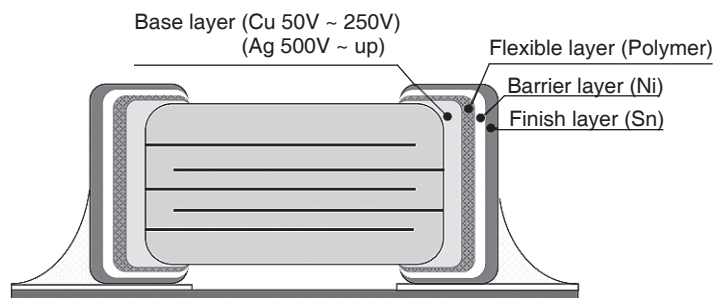
*Test Frequency & Voltage: Up to 100pF 1MHz/1.0Vrms, Above 100pF 1KHz/1.0Vrms

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

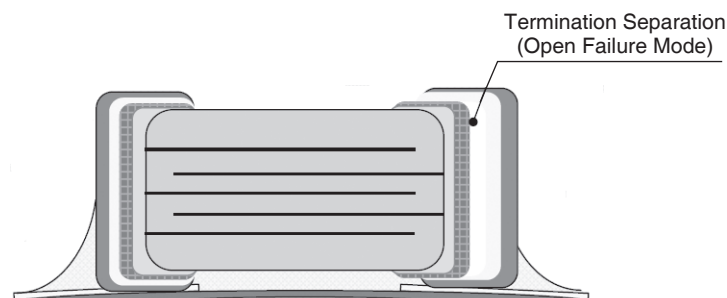
PART NUMBER SYSTEM



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	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																						
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																						
0.039																						
0.047																						
0.056																						
0.068																						
0.1μF																						

NPO VALUES AND SIZES (mm)

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																
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																
0.039																
0.047																
0.056																
0.068																
0.1μF																
0.12																
0.15																
0.22																

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														

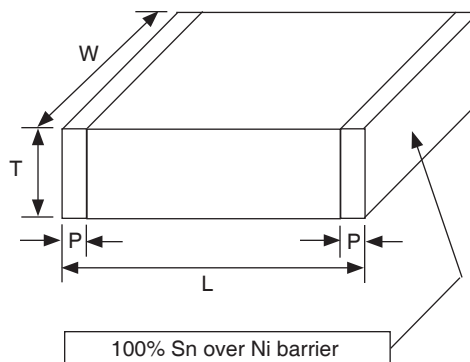
X7R HIGH VOLTAGE VALUES AND SIZES (mm)

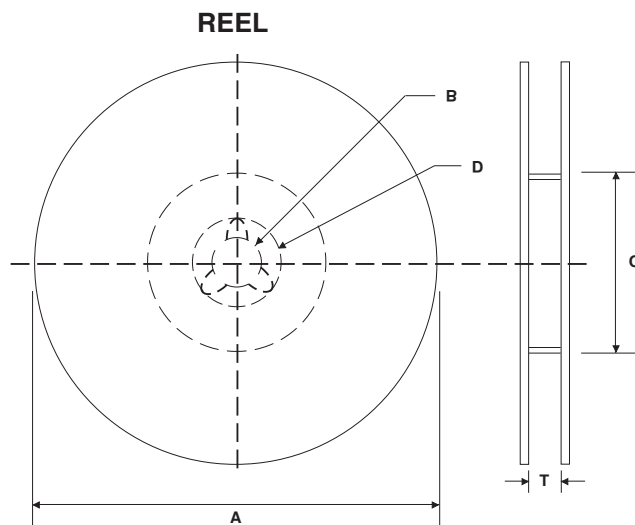
EIA Case Size	0805			1206					1210			
Length (L)	2.00 ± 0.2			3.20 ± 0.3					3.20 ± 0.3			
Width (W)	1.25 ± 0.25			1.60 ± 0.2					2.50 ± 0.2			
Thickness max. (T)	1.45 max.			1.80 max.					2.60 max.			
Termination Width (P)	0.20 min.			0.30 min.					0.30 min.			
Capacitance	Working Voltage (Vdc)											
	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												
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	1K
150pF																				
180																				
220																				
270																				
330																				
390																				
470																				
560																				
680																				
0.001μF																				
0.0015																				
0.0018																				
0.0022																				
0.0027																				
0.0033																				
0.0039																				
0.0047																				
0.0056																				
0.0068																				
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																				
0.18																				
0.22																				
0.27																				
0.33																				
0.39																				
0.47																				
0.56																				
0.68																				
1.0μF																				
1.5																				
2.2																				





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

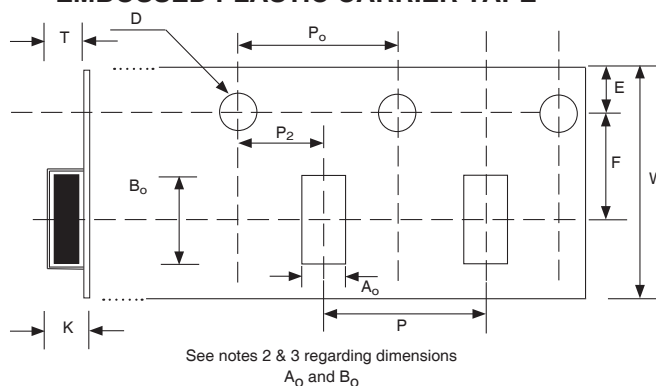
EMBOSSED PLASTIC CARRIER TAPE DIMENSIONS (mm)

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



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

