

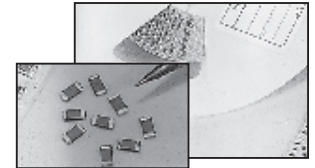
### FEATURES

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

### RoHS Compliant

Includes all homogeneous materials

\*See Part Number System for Details



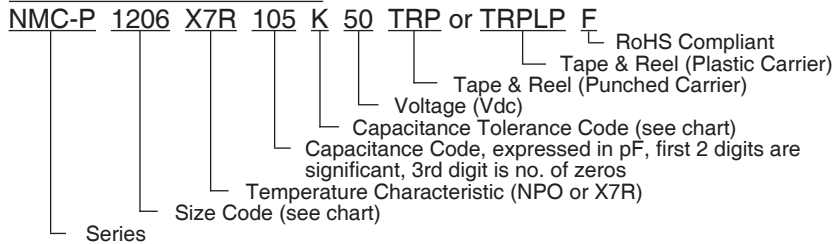
### SPECIFICATIONS

Temperature Coefficient	NPO	X7R
Capacitance Range	5pF ~ 0.22 $\mu$ F	180pF ~ 10 $\mu$ F
Capacitance Tolerance	For 2.2pF ~ 10pF: $\pm 0.1$ pF (B), $\pm 0.25$ pF (C), $\pm 0.5$ pF (D), $\pm 1$ 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	$\pm 30$ ppm/°C	$\pm 15\%$ $\Delta$ Cap.
Rated Voltages	16Vdc, 25Vdc, 50Vdc, 100Vdc, 200Vdc, 250Vdc, 500Vdc, 630Vdc, 1KVdc, 2Kvdc & 3Kvdc	
Q or Dissipation Factor	Q = $\geq 1000$ (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/ $\mu$ 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)	

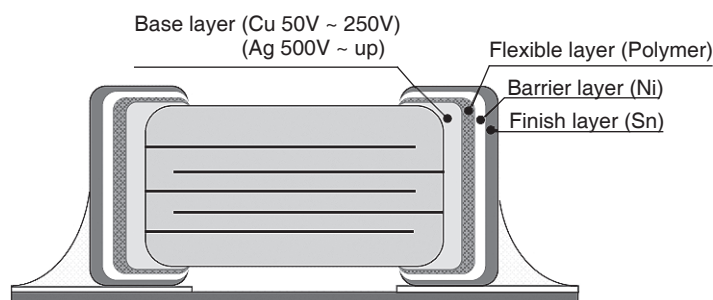
\*Test Frequency & Voltage: Up to 100pF 1MHz/1.0Vrms, Above 100pF 1KHz/1.0Vrms

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

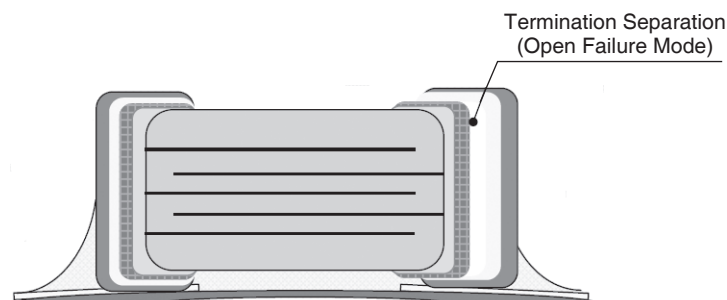
### PART NUMBER SYSTEM



### 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																				

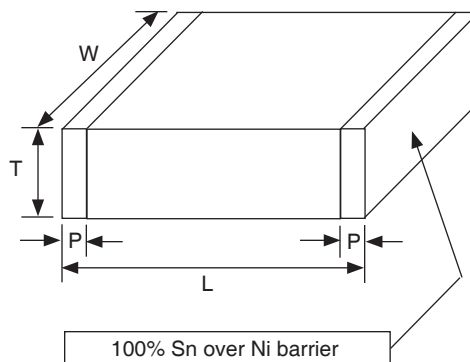
## X7R HIGH VOLTAGE VALUES AND SIZES (mm)

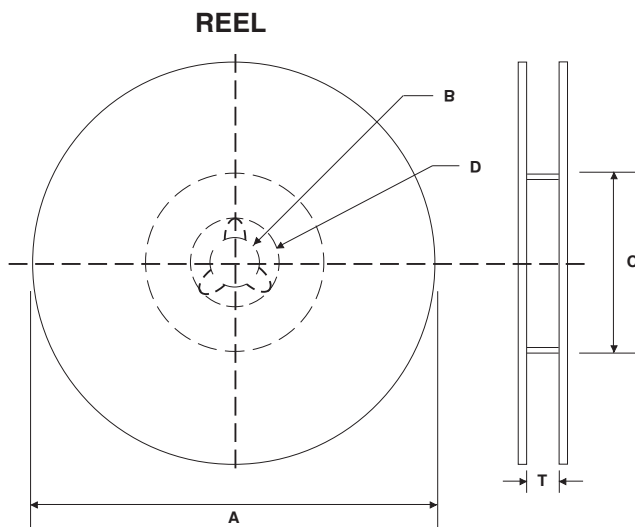
EIA Case Size	0805			1206				1210				
Length (L)	2.00 ± 0.2			3.20 ± 0.3				3.20 ± 0.3				
Width (W)	1.25 ± 0.25			1.60 ± 0.2				2.50 ± 0.2				
Thickness max. (T)	1.45 max.			1.80 max.				2.60 max.				
Termination Width (P)	0.20 min.			0.30 min.				0.30 min.				
Capacitance	Working Voltage (Vdc)											
	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																				
0.0018																				
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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

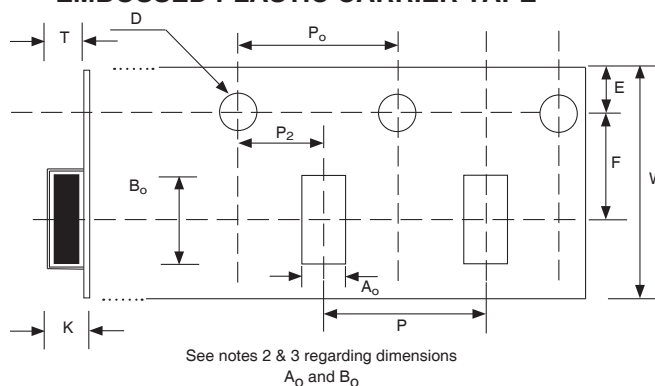
### EMBOSSED PLASTIC CARRIER TAPE DIMENSIONS (mm)

Tape Size	W	F	E	P <sub>0</sub>	P <sub>2</sub>	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 <sup>+0.1</sup> <sub>-0.0</sub>	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 A<sub>0</sub> (max.) equals component width dimension plus 0.5mm
- Dimension B<sub>0</sub> (max.) equals component length dimension plus 0.5mm

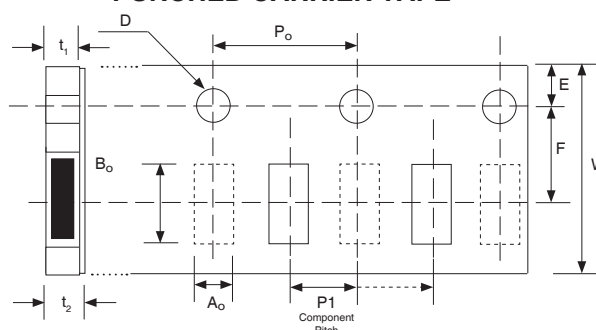
### EMBOSSED PLASTIC CARRIER TAPE



### PUNCHED CARRIER TAPE DIMENSIONS (mm)

Type	A <sub>0</sub>	B <sub>0</sub>	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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