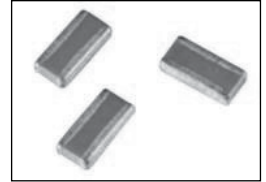


### FEATURES

- LOW INDUCTANCE (ESL) MULTILAYER CAPACITORS
- Up to 60% lower ESL (0306 size compared to 0603 size)
- X5R AND X7R TEMPERATURE CHARACTERISTICS
- REVERSE GEOMETRY 0204, 0306, 0508 & 0612 CASE SIZES
- CAPACITANCE VALUES UP TO 1.0 $\mu$ F

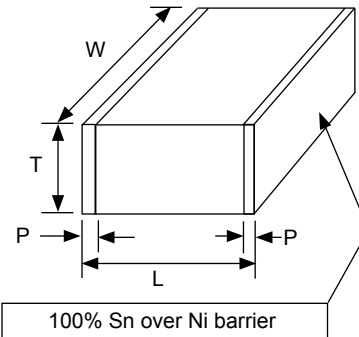
### RoHS Compliant

Includes all homogeneous materials  
\*See Part Number System for Details



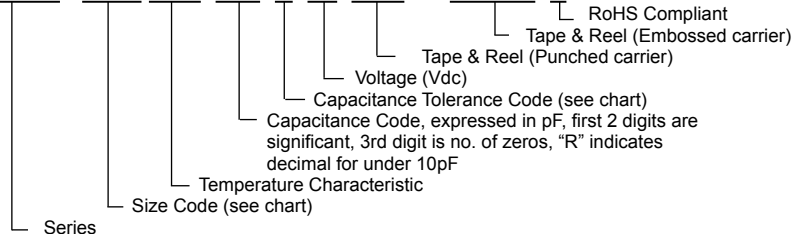
SPECIFICATIONS	X7R			X5R
Case Sizes	0306	0508	0612	0204
Capacitance Range*	0.1 $\mu$ F ~ 0.22 $\mu$ F	0.01 $\mu$ F ~ 1.0 $\mu$ F	0.01 $\mu$ F ~ 1.0 $\mu$ F	0.01 $\mu$ F ~ 0.1 $\mu$ F
Capacitance Tolerance	$\pm$ 10% (K), $\pm$ 20% (M)			
Temperature Characteristic	$\pm$ 15%			
Dissipation Factor	$\leq$ 5%			
Operating Temperature Range	-55 $^{\circ}$ C ~ +125 $^{\circ}$ C			-55 $^{\circ}$ C ~ +85 $^{\circ}$ C
Rated Voltage	10Vdc	10Vdc, 16Vdc, 25Vdc	6.3Vdc, 10Vdc, 16Vdc, 25Vdc, 50Vdc	6.3Vdc, 10Vdc
Insulation Resistance	10,000 Megohms min. or 500Megohm $\mu$ F whichever is less @ +25 $^{\circ}$ C			
Dielectric Withstanding Voltage	250% of rated voltage for 1 ~ 5 seconds, 50mA max.			
Test Conditions	0.5Vrms, 1KHz @ +20 $^{\circ}$ C			

EIA Case Size	0204	0306	0508	0612
Length (L)	0.50 $\pm$ 0.10	0.80 $\pm$ 0.15	1.25 $\pm$ 0.20	1.60 $\pm$ 0.20
Width (W)	1.00 $\pm$ 0.10	1.60 $\pm$ 0.20	2.00 $\pm$ 0.20	3.20 $\pm$ 0.20
Thickness (T)	0.40 max.	0.60 max.	0.95 max.	1.25 max.
Termination Width (P)	0.10 min.	0.10 min.	0.13 min.	0.13 min.



### PART NUMBER SYSTEM

NMC-R 0306 X7R 104 K 10 TRP or TRPLP E



Case Size	X7R 0306 Reverse Termination			
Length (L)	0.80 ± 0.15			
Width (W)	1.60 ± 0.20			
Termination Width (P)	0.10 min.			
Part Number	Capacitance (µF)	Voltage (VDC)	Tolerance	Maximum Thickness (mm)
NMC-R0306X7R104K10TRPF	0.1	10	±10%	0.95
NMC-R0306X7R224K10TRPF	0.22		±10%	0.95

Case Size	X7R 0508 Reverse Termination				
Length (L)	1.25 ± 0.20				
Width (W)	2.00 ± 0.20				
Termination Width (P)	0.13 min.				
Part Number	Capacitance (µF)	Voltage (VDC)	Tolerance	Maximum Thickness (mm)	
NMC-R0508X7R103K10TRPF	0.01	10	±10%	0.95	
NMC-R0508X7R153K10TRPF	0.015		±10%	0.95	
NMC-R0508X7R223K10TRPF	0.022		±10%	0.95	
NMC-R0508X7R333K10TRPF	0.033		±10%	0.95	
NMC-R0508X7R473K10TRPF	0.047		±10%	0.95	
NMC-R0508X7R683K10TRPF	0.068		±10%	0.95	
NMC-R0508X7R104K10TRPF	0.1		±10%	0.95	
NMC-R0508X7R154K10TRPF	0.15		±10%	0.95	
NMC-R0508X7R224K10TRPF	0.22		±10%	0.95	
NMC-R0508X7R474K10TRPF	0.47		±10%	0.95	
NMC-R0508X7R105K10TRPF	1.0		±10%	0.95	
NMC-R0508X7R103K16TRPF	0.01	16	±10%	0.95	
NMC-R0508X7R153K16TRPF	0.015		±10%	0.95	
NMC-R0508X7R223K16TRPF	0.022		±10%	0.95	
NMC-R0508X7R333K16TRPF	0.033		±10%	0.95	
NMC-R0508X7R473K16TRPF	0.047		±10%	0.95	
NMC-R0508X7R683K16TRPF	0.068		±10%	0.95	
NMC-R0508X7R104K16TRPF	0.1		±10%	0.95	
NMC-R0508X7R154K16TRPF	0.15		±10%	0.95	
NMC-R0508X7R224K16TRPF	0.22		±10%	0.95	
NMC-R0508X7R103K25TRPF	0.01		25	±10%	0.95
NMC-R0508X7R153K25TRPF	0.015			±10%	0.95
NMC-R0508X7R223K25TRPF	0.022	±10%		0.95	
NMC-R0508X7R333K25TRPF	0.033	±10%		0.95	
NMC-R0508X7R473K25TRPF	0.047	±10%		0.95	
NMC-R0508X7R683K25TRPF	0.068	±10%		0.95	
NMC-R0508X7R104K25TRPF	0.1	±10%		0.95	

Case Size	X7R 0612 Reverse Termination			
Length (L)	1.60 ± 0.20			
Width (W)	3.20 ± 0.20			
Termination Width (P)	0.13 min.			
Part Number	Capacitance (µF)	Voltage (VDC)	Tolerance	Maximum Thickness (mm)
NMC-R0612X7R103K6.3TRPF	0.01	6.3	±10%	0.95
NMC-R0612X7R153K6.3TRPF	0.015		±10%	0.95
NMC-R0612X7R223K6.3TRPF	0.022		±10%	0.95
NMC-R0612X7R333K6.3TRPF	0.033		±10%	0.95
NMC-R0612X7R473K6.3TRPF	0.047		±10%	0.95
NMC-R0612X7R683K6.3TRPF	0.068		±10%	0.95
NMC-R0612X7R104K6.3TRPF	0.1		±10%	0.95
NMC-R0612X7R154K6.3TRPF	0.15		±10%	0.95
NMC-R0612X7R224K6.3TRPF	0.22		±10%	0.95
NMC-R0612X7R334K6.3TRPF	0.33		±10%	0.95
NMC-R0612X7R474K6.3TRPF	0.47		±10%	0.95
NMC-R0612X7R684K6.3TRPLPF	0.68		±10%	1.25
NMC-R0612X7R105K6.3TRPLPF	1.0		±10%	1.25

X7R 0612 values continue on next page



# Multilayer Ceramic Chip Capacitors

NMC-R Series

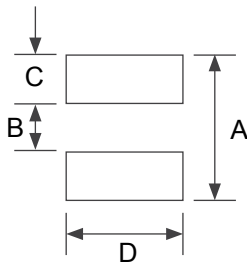
Case Size	X7R 0612 Reverse Termination			
Length (L)	1.60 ± 0.20			
Width (W)	3.20 ± 0.20			
Termination Width (P)	0.13 min.			
Part Number	Capacitance (µF)	Voltage (VDC)	Tolerance	Maximum Thickness (mm)
NMC-R0612X7R103K10TRPF	0.01	10	±10%	0.95
NMC-R0612X7R153K10TRPF	0.015		±10%	0.95
NMC-R0612X7R223K10TRPF	0.022		±10%	0.95
NMC-R0612X7R333K10TRPF	0.033		±10%	0.95
NMC-R0612X7R473K10TRPF	0.047		±10%	0.95
NMC-R0612X7R683K10TRPF	0.068		±10%	0.95
NMC-R0612X7R104K10TRPF	0.1		±10%	0.95
NMC-R0612X7R154K10TRPF	0.15		±10%	0.95
NMC-R0612X7R224K10TRPF	0.22		±10%	0.95
NMC-R0612X7R334K10TRPF	0.33		±10%	0.95
NMC-R0612X7R474K10TRPF	0.47		±10%	0.95
NMC-R0612X7R684K10TRPLPF	0.68		±10%	1.25
NMC-R0612X7R105K10TRPLPF	1.0		±10%	1.25
NMC-R0612X7R103K16TRPF	0.01	16	±10%	0.95
NMC-R0612X7R153K16TRPF	0.015		±10%	0.95
NMC-R0612X7R223K16TRPF	0.022		±10%	0.95
NMC-R0612X7R333K16TRPF	0.033		±10%	0.95
NMC-R0612X7R473K16TRPF	0.047		±10%	0.95
NMC-R0612X7R683K16TRPF	0.068		±10%	0.95
NMC-R0612X7R104K16TRPF	0.1		±10%	0.95
NMC-R0612X7R154K16TRPF	0.15		±10%	0.95
NMC-R0612X7R224K16TRPF	0.22		±10%	0.95
NMC-R0612X7R334K16TRPF	0.33		±10%	0.95
NMC-R0612X7R474K16TRPF	0.47		±10%	0.95
NMC-R0612X7R684K16TRPLPF	0.68		±10%	1.25
NMC-R0612X7R105K16TRPLPF	1.0		±10%	1.25
NMC-R0612X7R103K25TRPF	0.01	25	±10%	0.95
NMC-R0612X7R153K25TRPF	0.015		±10%	0.95
NMC-R0612X7R223K25TRPF	0.022		±10%	0.95
NMC-R0612X7R333K25TRPF	0.033		±10%	0.95
NMC-R0612X7R473K25TRPF	0.047		±10%	0.95
NMC-R0612X7R683K25TRPF	0.068		±10%	0.95
NMC-R0612X7R104K25TRPF	0.1		±10%	0.95
NMC-R0612X7R154K25TRPLPF	0.15		±10%	1.25
NMC-R0612X7R224K25TRPLPF	0.22		±10%	1.25
NMC-R0612X7R334K25TRPLPF	0.33		±10%	1.25
NMC-R0612X7R474K25TRPLPF	0.47		±10%	1.25
NMC-R0612X7R684K25TRPLPF	0.68		±10%	1.25
NMC-R0612X7R105K25TRPLPF	1.0		±10%	1.25
NMC-R0612X7R103K50TRPF	0.01	50	±10%	0.95
NMC-R0612X7R153K50TRPF	0.015		±10%	0.95
NMC-R0612X7R223K50TRPF	0.022		±10%	0.95
NMC-R0612X7R333K50TRPF	0.033		±10%	0.95
NMC-R0612X7R473K50TRPF	0.047		±10%	0.95
NMC-R0612X7R683K50TRPF	0.068		±10%	0.95
NMC-R0612X7R104K50TRPF	0.1		±10%	0.95
NMC-R0612X7R154K50TRPLPF	0.15		±10%	1.25
NMC-R0612X7R224K50TRPLPF	0.22		±10%	1.25
NMC-R0612X7R334K50TRPLPF	0.33		±10%	1.25
NMC-R0612X7R474K50TRPLPF	0.47		±10%	1.25



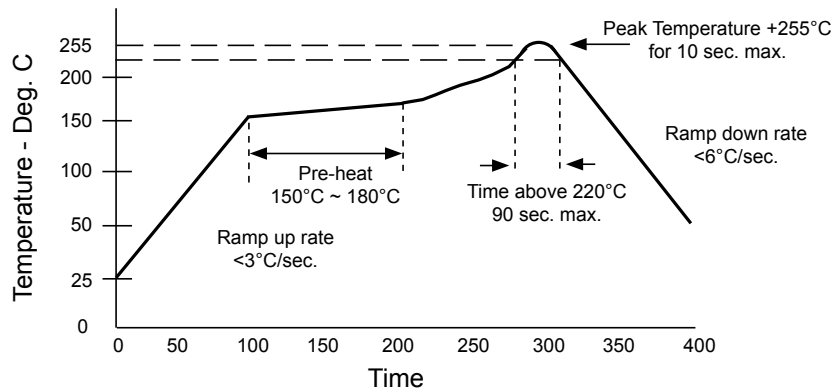
Case Size	X5R 0204 Reverse Termination			
Length (L)	0.50 ± 0.10			
Width (W)	1.00 ± 0.10			
Termination Width (P)	0.10 min.			
Part Number	Capacitance (µF)	Voltage (VDC)	Tolerance	Maximum Thickness (mm)
NMC-R0204X5R103K6.3TRPF	0.01	6.3	±10%	0.40
NMC-R0204X5R153K6.3TRPF	0.015		±10%	0.40
NMC-R0204X5R223K6.3TRPF	0.022		±10%	0.40
NMC-R0204X5R333K6.3TRPF	0.033		±10%	0.40
NMC-R0204X5R473K6.3TRPF	0.047		±10%	0.40
NMC-R0204X5R683K6.3TRPF	0.068		±10%	0.40
NMC-R0204X5R104K6.3TRPF	0.1		±10%	0.40
NMC-R0204X5R103K10TRPF	0.01	10	±10%	0.40
NMC-R0204X5R153K10TRPF	0.015		±10%	0.40
NMC-R0204X5R223K10TRPF	0.022		±10%	0.40
NMC-R0204X5R333K10TRPF	0.033		±10%	0.40
NMC-R0204X5R473K10TRPF	0.047		±10%	0.40
NMC-R0204X5R683K10TRPF	0.068		±10%	0.40
NMC-R0204X5R104K10TRPF	0.1		±10%	0.40

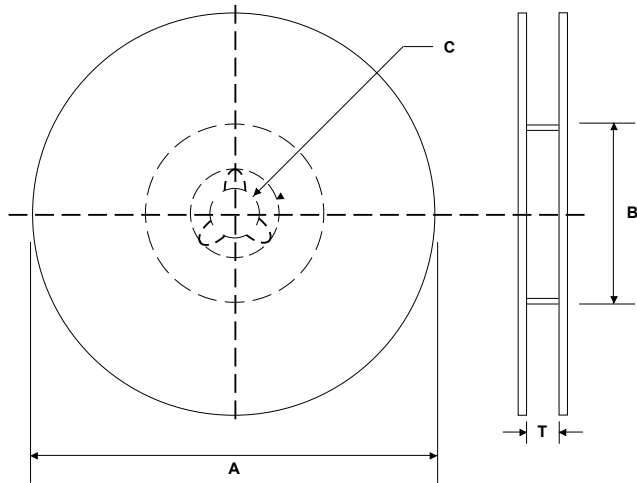
### LAND PATTERN DIMENSIONS (mm)

Case Size	0204	0306	0508	0612
A	0.55 ~ 0.65	0.70 ~ 1.00	1.20 ~ 1.50	1.80 ~ 2.30
B	0.15 ~ 0.20	0.20 ~ 0.30	0.40 ~ 0.50	0.60 ~ 0.80
C	0.20 ~ 0.25	0.30 ~ 0.40	0.40 ~ 0.50	0.60 ~ 0.70
D	0.70 ~ 1.00	1.40 ~ 1.60	1.40 ~ 1.80	2.60 ~ 2.80



### RECOMMENDED REFLOW PROFILE





### REEL DIMENSIONS (mm)

Reel Diameter (A)	Tape Width	B	C	T max.
7" (178 ± 1.0)	8.0	60 ± 1.0	13.0	9.0 ± 0.2
13" (330 ± 1.0)		100 ± 1.0	+0.5/-0.2	9.0 ± 0.2

### REEL QUANTITIES

Size	0204	0306	0508	0612
7" (178mm)	10,000	4,000	4,000	4,000 (0.95mm max. thk) 3,000 (1.25mm max. thk)
13" (178mm)	50,000	15,000	15,000	15,000 (0.95mm Thk) 10,000 (1.25mm Thk)

### PUNCHED CARRIER TAPE DIMENSIONS (mm)

Type	A <sub>o</sub>	B <sub>o</sub>	W	F	E	P1	P0	D0	t
0204	0.65 ± 0.15	1.10 ± 0.15	8.0 ± 0.20	3.5 ± 0.05	1.75 ± 0.1	2.0 ± 0.05	4.0 ± 0.05	1.5 +0.1/-0.0	0.60 ± 0.10
0306	0.95 ± 0.15	1.78 ± 0.15				0.95 ± 0.15			
0508	1.50 ± 0.15	2.26 ± 0.20				0.95 ± 0.10			
0612	1.90 ± 0.15	3.50 ± 0.20				0.95 ± 0.10			

