

## FEATURES

- High reliability
- Small size with high dielectric constant
- Low inductance
- Popular temperature coefficients available
- Wide operating temperature range
- High insulation resistance
- Case sizes: 0402, 0603, 0805, 1206, 1210



## CHARACTERISTICS

Item	Characteristics		
	NPO / COG	X7R	Z5U
Operating Temperature Range	-55°C ~ +125°C	-55°C ~ +125°C	-25°C ~ +85°C
Temperature Coefficient	±30ppm/°C for C>20pF +120ppm, -40ppm/°C for C≤20pF	ΔC ±15% maximum over -55°C +125°C	ΔC ±56%-22% maximum over +10°C +85°C
Measuring Conditions for Capacitance and D.F.	1MHz, 1Vrms for C≤1,000pF 1KHz, 1Vrms for C>1,000pF	1KHz, 1Vrms	1KHz, 0.3Vrms
Dissipation Factor and Tangent of Loss Angle (Tan δ)	≥0.001 for C≥50pF ≤1.5(150/C + 7) x 10 <sup>-2</sup> for C<50pF	≤0.025	≤0.030
Insulation Resis. After 60 sec. Charging at Rated Voltage 25°C	≥100GΩ or ≥1,000MΩ(C) whichever is less	≥100GΩ or ≥1,000MΩ(C) whichever is less	≥10GΩ or ≥1,000MΩ(C) whichever is less
Voltage Test 25°C	2.5 x rated voltage	2.5 x rated voltage	2.5 x rated voltage
Capacitance Aging	0	=1.5% per decade hour	=5% per decade hour

## PART NUMBERING SYSTEM

<b>C</b>	<b>C</b>	<b>5</b>	<b>0</b>	<b>2</b>	<b>N</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>J</b>	<b>/</b>	<b>R</b>	<b>E</b>	<b>E</b>	<b>L</b>
Series		Voltage		Case Size	Temperature Coefficient	Value			Tolerance	Suffix				

## CODES FOR CASE SIZE, TEMPERATURE COEFFICIENT, AND TOLERANCE

Case Size	Code
0805	1
1206	2
1210	3
0603	4
0402	5

Temperature Coefficient	Code
NPO / COG	N
X7R	B
Z5U	Z
Y5V	V

Tolerance	Code	Tolerance	Code
±0.25pF	C	±20%	M
±0.5pF	D	+80% -20%	Z
±5%	J	+100% -0%	P
±10%	K	GMV	V

Suffix	Code
Tape and Reel	/REEL
Bulk	-BK

For capacitance values below 10pF, use C or D.  
GMV = Guaranteed Minimum Value

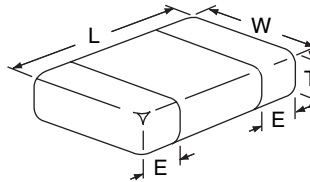
## ■ CAPACITANCE RANGES

Case Size	NPO / COG		X7R		Z5U (0805, 1206, 1210) / Y5V (0603)	
	50V	100V	50V	100V	50V	100V
0402	1.0pF~220pF		220pF~1000pF			---
0603	1.0pF~470pF		100pF~0.01 $\mu$ F		0.01 $\mu$ F~0.1 $\mu$ F	---
0805	1.0pF~1500pF	1.0pF~1000pF	100pF~0.1 $\mu$ F	100pF~.022 $\mu$ F	2700pF~0.15 $\mu$ F	---
1206	1.0pF~3900pF	1.0pF~2700pF	100pF~0.1 $\mu$ F	100pF~.047 $\mu$ F	8200pF~0.47 $\mu$ F	---
1210	4700pF~8200pF	3300pF~5600pF	0.12 $\mu$ F~0.22 $\mu$ F	.047 $\mu$ F~0.1 $\mu$ F	0.22 $\mu$ F~0.68 $\mu$ F	---

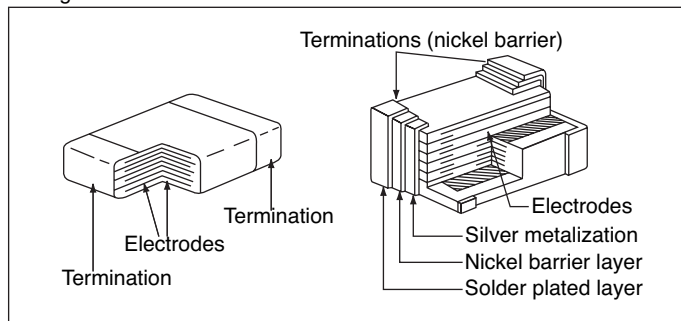
## ■ TOLERANCE AVAILABLE

Availability	NPO / COG				X7R			Z5U		
	$\pm 0.25$ pF	$\pm 0.5$ pF	$\pm 2\%$	$\pm 5\%$	$\pm 5\%$	$\pm 10\%$	$\pm 20\%$	$\pm 20\%$	+80% -20%	+100% -0%
Capacitance	<5pF	$\leq 10$ pF	>13pF	$\geq 10$ pF	All Values	All Values	All Values	All Values	All Values	All Values

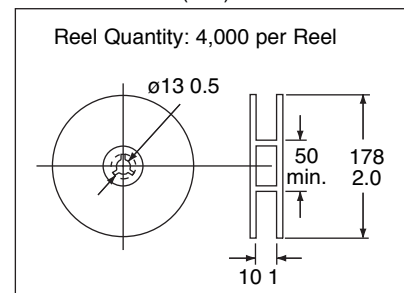
## ■ DIMENSIONS



Configuration:



Reel Dimensions (mm):



Case Size	Dimensions (mm)			
	L (length)	W (width)	T (thickness) max.	E (termination)
0402	1.0 $\pm 0.2$	0.5 $\pm 0.2$	.35	0.5 $\pm 0.2$
0603	1.52 $\pm 0.2$	0.8 $\pm 0.2$	.65	0.5 $\pm 0.2$
0805	2.0 $\pm 0.2$	1.2 $\pm 0.2$	1.0	0.5 $\pm 0.2$
1206	3.2 $\pm 0.2$	1.6 $\pm 0.2$	1.25	0.5 $\pm 0.2$
1210	3.2 $\pm 0.2$	2.5 $\pm 0.2$	1.3	0.5 $\pm 0.2$