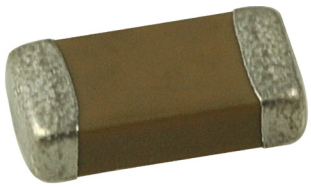
General Purpose Ceramic Capacitors (C Series)



Features:

- RoHS Compliant and Halogen Free
- Capacitance range: 0.1pF to 220uF
- Voltage range: 4V to 100V
- Terminations: 100% matte Tin (Sn), Palladium (Pd-Ag), Gold (Au) and Lead (Pb)
- Very low ESR in X7R/X5R (<10mΩ typical)

Part Number Structure

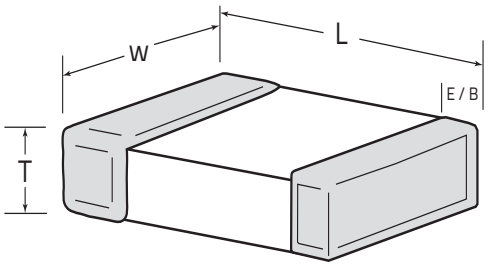
C	0805	C0G	500 —	101	J	N	P	□□
Series	**Size**	**Temperature Characteristic (Dielectric)**	**Rated Voltage**	**Capacitance (picofarads)**	**Tolerance**	**Termination**	**Packaging**	***Optional Thickness Identifier***
	01005 0201 0402 0504 0603 0805 1206 1210 1812 2220 2221	C0G X7R X7S X6S X5R Y5V Z5U	1st two digits are significant followed by number of zeroes. 4R0 = 4.0 VDCW 6R3 = 6.3 VDCW 100 = 10 VDCW 160 = 16 VDCW 250 = 25 VDCW 500 = 50 VDCW 630 = 63 VDCW 101 = 100 VDCW	1st two digits are significant, followed by number of zeroes. **e.g:** 101 = 100pF R denotes decimal 6R8 = 6.8pF	* B = ± 0.1pF * C = ± 0.25pF * D = ± 0.5pF F = ± 1% G = ± 2% J = ± 5% K = ± 10% M = ± 20% N = ± 30% Z = +80 - 20% * For values below 10pF only.	N = 100% matte Tin (Sn) over Nickel * P = Palladium Silver * G = Gold over Nickel Pb = 90% Tin (Sn)/10% Lead (Pb) * Pd/Ag & Gold terminations have limited values & sizes available.	D = Paper Tape (10" Reel) E = Embossed Tape (7" Reel) P = Paper Tape (7" Reel) R = Paper Tape (13" Reel) U = Embossed Tape (13" Reel)	Leave blank for standard thickness. Designate "-" for Min. "*" for Max. followed by Thickness Code **e.g:**-E (min. thickness of .026") *E (max. thickness of .026")

Example P/N: C0805C0G500-101JNP

Optional Thickness Identifier Codes:

CODE:	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	6
DIMENSION:	.015	.020	.026	.030	.035	.040	.045	.050	.055	.060	.065	.070	.075	.080	.085	.090	.095	.100	.105	.110	.023

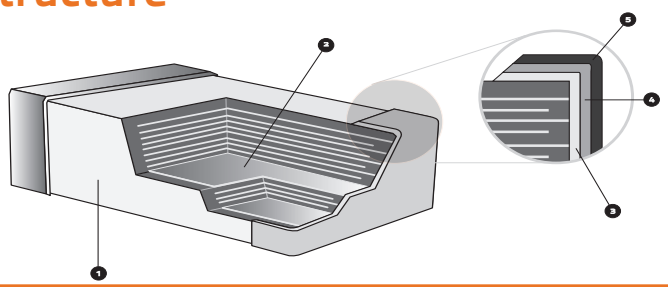
Dimensions



Unit: inches (mm)

Size	L	W	T	E/B
01005	0.016 ± 0.0008 (0.4 ± 0.02)	0.008 ± 0.0008 (0.2 ± 0.02)	See Specific Value	0.002 (min.) (0.05)
0201	0.024 ± 0.002 (0.6 ± 0.05)	0.012 ± 0.002 (0.3 ± 0.05)	See Specific Value	0.002 (min.) (0.20)
0402	0.040 ± 0.002 (1.0 ± 0.05)	0.020 ± 0.002 (0.5 ± 0.05)	See Specific Value	0.004 (min.) (0.10)
0603	0.063 ± 0.006 (1.6 ± 0.15)	0.031 ± 0.0046 (0.8 ± 0.15)	See Specific Value	0.008 (min.) (0.20)
0805	0.08 ± 0.008 (2.0 ± 0.20)	0.050 ± 0.008 (1.25 ± 0.20)	See Specific Value	0.020 ± 0.010 (0.508 ± 0.254)
1206	0.126 ± 0.008 (3.2 ± 0.20)	0.063 ± 0.008 (1.6 ± 0.20)	See Specific Value	0.020 ± 0.010 (0.508 ± 0.254)
1210	0.126 ± 0.008 (3.2 ± 0.20)	0.098 ± 0.008 (2.50 ± 0.20)	See Specific Value	0.020 ± 0.010 (0.508 ± 0.254)
1812	0.177 ± 0.012 (4.495 ± 0.30)	0.126 ± 0.012 (3.20 ± 0.30)	See Specific Value	0.024 ± 0.015 (0.6096 ± 0.381)
2220	0.225 ± 0.016 (5.715 ± 0.41)	0.200 ± 0.006 (5.08 ± 0.41)	See Specific Value	0.025 ± 0.015 (0.635 ± 0.381)

Structure



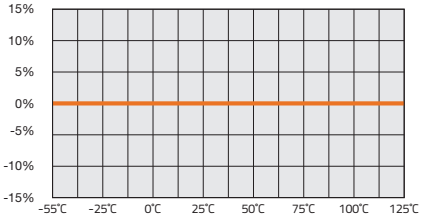
1	Ceramic Body (dielectric)	4	Nickel Plating
2	Inner Electrode	5	Tin Plating
3	Inner Termination		

General Purpose Ceramic Capacitors (C Series)

Electrical Specifications

NPO/COG

Typical Capacitance Change vs. Temperature

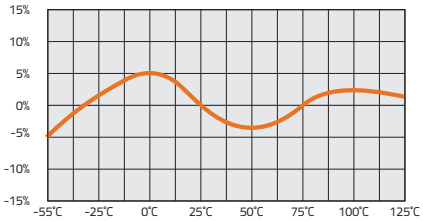


Operating Temperature Range:
-55°C to +125°C
Temperature Coefficient:
0 ±30PPM/°C
Temperature Voltage Coefficient:
0 ±30PPM/°C
Insulation Resistance:
>1000 Ω-F or 10 GΩ, for values ≤ 0.047uF (whichever is less at 25°C, WDCV).
For Capacitance values > 0.047uF, the 500 Ω-F rule applies. (The IR at 125°C is 10% of the value at 25°C)

Ageing:
None
Withstanding Voltage:
>2.5 times VDCW
Capacitance Tolerance:
B,C,D,F,G,J,K
Dissipation Factor:
0.1% max

X7R

Typical Capacitance Change vs. Temperature

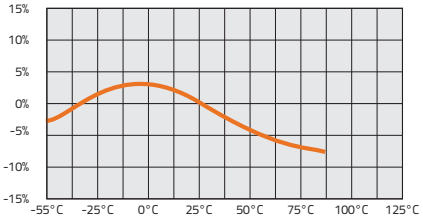


Operating Temperature Range:
-55°C to +125°C
Temperature Coefficient:
0 ±15%Δ°C MAX.
Temperature Voltage Coefficient:
X7R not applicable
Insulation Resistance:
>100 Ω-F or 10 GΩ, whichever is less at 25°C, VDCW. (The IR at 125°C is 10% of the value at 25°C)
Ageing:
2.5% per decade hour, typical
Withstanding Voltage:
>2.5 times VDCW
Capacitance Tolerance:
J,K,M

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤2.5%	≤3%	0201 (50V); 0603≥0.047uF 0805≥0.22uF; 1206≥0.47uF
		≤5%	0603≥1uF; 0805≥1uF; 1206≥4.7uF; 1210≥4.7uF
25V	≤2.5%	≤5%	0201≥0.01uF; 0805≥1uF; 1210≥4.7uF
		≤10%	0402≥0.10uF; 0603≥0.33uF; 0805≥2.2uF 1206≥4.7uF; 1210≥22uF
16V	≤3.5%	≤5%	0201≥0.01uF; 0402≥0.033uF; 0805≥0.68uF; 1206≥2.2uF; 1210≥4.7uF
		≤10%	0402≥0.47uF; 0603≥0.68uF; 0805≥2.2uF; 1206≥4.7uF; 1210≥22uF
10V	≤5%	≤10%	0402≥0.33uF; 0603≥0.33uF; 0805≥2.2uF; 1206≥2.2uF; 1210≥22uF
6.3V	≤10%		

X5R

Typical Capacitance Change vs. Temperature

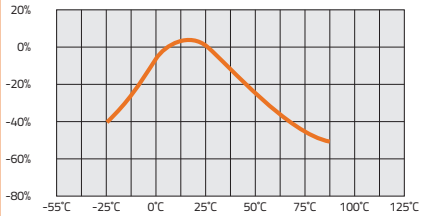


Operating Temperature Range:
-55°C to +85°C
Temperature Coefficient:
0 ±15%Δ°C MAX.
Temperature Voltage Coefficient:
X5R not applicable
Insulation Resistance:
>100 Ω-F or 10 GΩ, whichever is less at 25°C, VDCW. (The IR at 125°C is 10% of the value at 25°C)
Ageing:
2.5% per decade hour, typical
Withstanding Voltage:
>2.5 times VDCW
Capacitance Tolerance:
K,M

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤2.5%	≤3%	0201 (50V); 0603≥0.047uF 0805≥0.22uF; 1206≥0.47uF
		≤5%	0603≥1uF; 0805≥1uF; 1206≥4.7uF; 1210≥4.7uF
25V	≤2.5%	≤5%	0201≥0.01uF; 0805≥1uF; 1210≥4.7uF
		≤10%	0402≥0.10uF; 0603≥0.33uF; 0805≥2.2uF 1206≥4.7uF; 1210≥22uF
16V	≤3.5%	≤5%	0201≥0.01uF; 0402≥0.033uF; 0805≥0.68uF; 1206≥2.2uF; 1210≥4.7uF
		≤10%	0402≥0.47uF; 0603≥0.68uF; 0805≥2.2uF; 1206≥4.7uF; 1210≥22uF
10V	≤5%	≤10%	0402≥0.33uF; 0603≥0.33uF; 0805≥2.2uF; 1206≥2.2uF; 1210≥22uF
6.3V	≤10%		

Z5U

Typical Capacitance Change vs. Temperature



Operating Temperature Range:
+10°C to +85°C
Temperature Coefficient:
+22% - 56%Δ°C MAX.
Insulation Resistance:
>100 Ω-F or 10 GΩ, whichever is less at 25°C, WDCV. (The IR at 125°C is 10% of the value at 25°C)
Ageing:
5% per decade hour, typical
Withstanding Voltage:
>2.5 times VDCW
Capacitance Tolerance:
M,Z

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤5%	≤9%	0603≥0.1uF; 0805≥0.47uF; 1206≥4.7uF;
25V	≤5%	≤9%	0402≥0.047uF; 0603≥0.1uF; 0805≥0.33uF; 1206≥1uF; 1210≥4.7uF
16V	≤9%	≤12.5%	0603≥2.2uF; 0805≥3.3uF; 1206≥10uF; 1210≥22uF; 1812≥47uF
10V	≤12.5%	≤16%	0603≥2.2uF; 0805≥3.3uF; 1206≥4.7uF; 1210≥10uF; 1812≥47uF
6.3V	≤16%		

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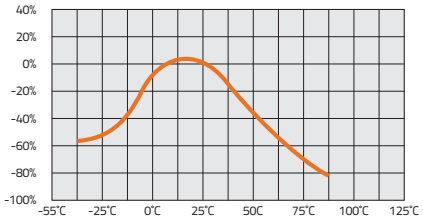
Rev. 01/2019-B

Electrical Specifications

Y5V

Typical Capacitance Change vs. Temperature



Operating Temperature Range:
-30°C to +85°C
Temperature Coefficient:
+22% - 82%Δ°C MAX.
Insulation Resistance:
>100 Ω-F or 10 GΩ, whichever is less at 25°C, WDCV. (The IR at 125°C is 10% of the value at 25°C)
Ageing:
7% per decade hour, typical
Withstanding Voltage:
>2.5 times VDCW
Capacitance Tolerance:
M,Z

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤5%	≤9%	0603≥0.1uF; 0805≥0.47uF; 1206≥4.7uF;
25V	≤5%	≤9%	0402≥0.047uF; 0603≥0.1uF; 0805≥0.33uF; 1206≥1uF; 1210≥4.7uF
16V	≤9%	≤12.5%	0603≥2.2uF; 0805≥3.3uF; 1206≥10uF; 1210≥22uF; 1812≥47uF
10V	≤12.5%	≤16%	0603≥2.2uF; 0805≥3.3uF; 1206≥4.7uF; 1210≥10uF; 1812≥47uF
6.3V	≤16%		

Test Parameters

Test parameters for Multilayer Ceramic Capacitors - X7R, X5R, X6S, X7S, Z5U and Y5V:
1KHz ± 100Hz at 1.0 ± 0.2 Vrms < 10uF (10 V min.)
1KHz ± 100Hz at 1.0 ± 0.1 Vrms < 10uF (6.3V max.)
120Hz ± 24Hz at 1.0 ± 0.1 Vrms ≥ 10uF

Test parameters for Multilayer Ceramic Capacitors - NPO/C0G:
1MHz ± 100KHz at 1.0 ± 0.2 Vrms ≤ 1000pF, 25°C
1KHz ± 100Hz at 1.0 ± 0.2 Vrms > 1000pF, 25°C

Note: To ensure proper capacitance readings, the voltage level must be held constant. The HP4284 and Agilent E4980 has a "ALC" (Automatic Level Control) function and should be switched to the "ON" position for accurate capacitance readings.

Voltage and Capacitance Range

C0G (NPO) Dielectric

Values that are typically available.

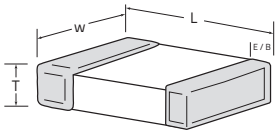
(All measurements in inches)

Size			01005 (± 0.0008)				0201 (± 0.002)		0402 (± 0.004)			0504 (± 0.008)		0603 (± 0.006)		0805 (± 0.008)			1206 (± 0.008)		1210 (±0.008)		1812 (±0.012)	
T (max)			0.008				0.012		0.025			0.040		0.033		0.055			0.070		0.075		0.085	
Min E/B			0.002				0.002		0.004			0.005		0.008		0.020 ± .010			0.020 ± .010		0.020 ± .010		0.024 ± .015	
VDCW (MAX)			6.3V	16V	25V	50V	25V	50V	25V	50V	100V	50V	100V	50V	100V	25V	50V	100V	50V	100V	50V	100V	50V	100V
CAPACITANCE CODE		CAPACITANCE VALUE																						
0R1		0.1pF																						
0R2		0.2pF																						
0R3		0.3pF																						
0R4		0.4pF																						
0R5		0.5pF																						
1R0		1.0pF																						
1R2		1.2																						
1R5		1.5																						
1R8		1.8																						
2R2		2.2																						
2R7		2.7																						
3R3		3.3																						
3R9		3.9																						
4R7		4.7																						
5R0		5.0																						
5R6		5.6																						
6R8		6.8																						
8R2		8.2																						
100		10pF																						
120		12																						
150		15																						
180		18																						
220		22																						

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

Voltage and Capacitance Range

COG (NPO) Dielectric



Values that are typically available.

(All measurements in inches)

Size			01005 (± 0.0008)				0201 (± 0.002)		0402 (± 0.004)			0504 (± 0.008)		0603 (± 0.006)		0805 (± 0.008)			1206 (± 0.008)		1210 (±0.008)		1812 (±0.012)		2220 / 2221 (±0.016)	
L			0.016				0.024		0.040			0.053		0.063		0.080			0.126		0.126		0.177		0.225 / .225	
W			0.008				0.012		0.020			0.040		0.032		0.050			0.063		0.098		0.126		0.200 / .210	
T (max)			0.008				0.012		0.025			0.040		0.033		0.055			0.070		0.075		0.085		0.108 / .108	
Min E/B			0.002				0.002		0.004			0.005		0.008		0.020 ± .010			0.020 ± .010		0.020 ± .010		0.024 ± .015		0.025 ± .015	
VDCW (MAX)			6.3V	16V	25V	50V	25V	50V	25V	50V	100V	50V	100V	50V	100V	25V	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V
CAPACITANCE CODE		CAPACITANCE VALUE																								
270		27		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
330		33		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
390		39		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
470		47		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
560		56	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
680		68	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
820		82	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
101		100pF	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
121		120							■	■	■	■	■	■	■	■	■	■	■	■	■	■				
151		150							■	■	■	■	■	■	■	■	■	■	■	■	■	■				
181		180							■	■	■	■	■	■	■	■	■	■	■	■	■	■				
221		220							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
271		270							■	■		■	■	■	■	■	■	■	■	■	■	■	■			
331		330							■	■		■		■	■	■	■	■	■	■	■	■	■			
391		390							■	■		■		■	■	■	■	■	■	■	■	■	■			
471		470							■	■		■		■	■	■	■	■	■	■	■	■	■			
561		560							■	■		■		■	■	■	■	■	■	■	■	■	■			
681		680							■	■		■		■	■	■	■	■	■	■	■	■	■			
821		820							■	■		■		■		■	■	■	■	■	■	■	■			
102		1000pF							■	■		■		■	■	■	■	■	■	■	■	■	■	■		
122		1200												■		■	■	■	■	■	■	■	■	■		
152		1500												■	■	■	■	■	■	■	■	■	■	■		
182		1800												■		■	■	■	■	■	■	■	■	■		
222		2200												■		■	■	■	■	■	■	■	■	■		
272		2700												■		■	■		■	■	■	■	■	■		
332		3300												■		■	■		■	■	■	■	■	■		
392		3900												■	■	■	■		■	■	■	■	■	■		
472		4700												■		■	■		■	■	■	■	■	■	■	■
562		5600												■		■	■		■		■		■	■	■	■
682		6800												■		■	■		■	■	■		■	■	■	■
822		8200												■		■	■		■		■		■	■	■	■
103		.01uF												■		■	■		■	■	■		■	■	■	■
123		.012														■	■		■				■		■	■
153		.015															■		■				■		■	■
183		.018																	■				■		■	■
223		.022														■	■		■				■		■	■
273		.027																	■				■		■	■
333		.033																	■						■	■
393		.039																							■	■
473		.047																	■				■		■	■
563		.056																	■						■	
683		.068																	■				■		■	
823		.082																	■							
104		.100uF																25V	~~50V~~				■	■		
124		.120																								
154		.150																								
184		.180																								
224		.220																					■			
274		.270																								
334		.330																								
394		.390																								
474		.470																								
564		.560																								
684		.680																								
824		.820																								

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

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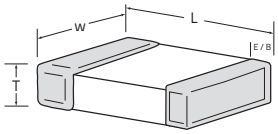
Rev. 01/2019-B

Voltage and Capacitance Range

X7R Dielectric



Values that are typically available.

(All measurements in inches)

Size			01005 (± 0.0008)		0201 (± 0.002)				**0402** (± 0.004)				0504 (± 0.008)			0603 (± 0.006)					0805 (± 0.008)		
L			0.016		0.024				0.040				0.053			0.063					0.080		
W			0.008		0.012				0.020				0.040			0.032					0.050		
T (max)			0.008		0.012				0.025				0.040			0.038					0.058		
Min E/B			0.002		0.002				0.004				0.005			0.008					0.020 ± .010		
VDCW (MAX)			6.3V	10V	6.3V	10V	16V	25V	16V	25V	50V	100V	25V	50V	100V	10V	16V	25V	50V	100V	25V	50V	100V
CAPACITANCE CODE		CAPACITANCE VALUE																					
101		100pF	■	■		■	■	■		■	■	■	■	■	■		■	■	■	■	■	■	■
121		120		■		■	■	■				■	■	■	■		■	■	■	■	■	■	■
151		150		■		■	■	■				■	■	■	■		■	■	■	■	■	■	■
181		180		■		■	■	■				■	■	■	■		■	■	■	■	■	■	■
221		220	■	■		■	■	■			■	■	■	■	■		■	■	■	■	■	■	■
271		270				■	■	■			■	■	■	■	■		■	■	■	■	■	■	■
331		330	■	■		■	■	■			■	■	■	■	■		■	■	■	■	■	■	■
391		390				■	■	■		■	■	■	■	■	■		■	■	■	■	■	■	■
471		470	■	■		■	■	■		■	■	■	■	■	■		■	■	■	■	■	■	■
561		560				■	■	■		■	■	■	■	■	■		■	■	■	■	■	■	■
681		680	■	■		■	■	■		■	■	■	■	■	■		■	■	■	■	■	■	■
821		820				■	■	■		■	■	■	■	■	■		■	■	■	■	■	■	■
102		1000pF		■	■	■	■	■		■	■	■	■	■	■		■	■	■	■	■	■	■
122		1200					■			■	■	■	■	■	■		■	■	■	■	■	■	■
152		1500			■	■	■	■		■	■	■	■	■	■		■	■	■	■	■	■	■
182		1800								■	■	■	■	■	■		■	■	■	■	■	■	■
222		2200			■	■	■	■		■	■	■	■	■	■		■	■	■	■	■	■	■
272		2700								■	■	■	■	■	■		■	■	■	■	■	■	■
332		3300			■	■	■			■	■	■	■	■	■		■	■	■	■	■	■	■
392		3900								■	■	■	■	■	■		■	■	■	■	■	■	■
472		4700			■	■	■			■	■	■	■	■	■		■	■	■	■	■	■	■
562		5600							■	■	■		■	■	■		■	■	■	■	■	■	■
682		6800			■	■			■	■	■		■	■	■		■	■	■	■	■	■	■
822		8200							■	■	■		■	■	■		■	■	■	■	■	■	■
103		.01uF			■	■			■	■	■		■	■	■	■	■	■	■	■	■	■	■
123		.012							■	■	■		■	■		■	■	■	■		■	■	■
153		.015							■	■	■		■	■		■	■	■	■		■	■	■
183		.018							■	■	■		■			■	■	■	■		■	■	■
223		.022							■	■	■		■			■	■	■	■	■	■	■	■
273		.027							■	■	■					■	■	■	■		■	■	■
333		.033							■	■	■					■	■	■	■		■	■	■

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.
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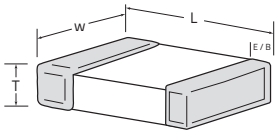
General Purpose Ceramic Capacitors (C Series)

Voltage and Capacitance Range

X7R Dielectric



Values that are typically available.

(All measurements in inches)

Size				0201 (± 0.002)			0402 (± 0.004)					0603 (± 0.006)						0805 (± 0.008)					
L				0.024			0.040					0.063						0.080					
W				0.012			0.020					0.032						0.050					
T (max)*				0.012			0.025					0.038						0.058					
Min E/B				0.002			0.004					0.008						0.020 ± .010					
VDCW (MAX)				4V	6.3V	10V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V
CAPACITANCE CODE		CAPACITANCE VALUE																					
	393		.039				■	■	■	■	■		■	■	■	■					■	■	■
	473		.047				■	■	■	■	■		■	■	■	■					■	■	■
	563		.056							■	■		■	■	■						■	■	■
	683		.068					■	■	■	■		■	■	■	■					■	■	
	823		.082				■	■	■	■	■		■	■	■					■	■	■	
	104		.100uF				■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■
	124		.120										■	■					■	■	■		
	154		.150									■	■	■	■				■	■	■	■	
	184		.180										■	■					■	■	■	■	
	224		.220						■			■	■	■	■	■			■	■	■	■	
	274		.270										■	■					■	■	■		
	334		.330									■	■	■					■	■	■	■	
	394		.390																■	■	■		
	474		.470									■	■	■	■				■	■	■	■	■
	564		.560																				
	684		.680																■	■			
	824		.820																■	■			
	105		1.00uF				■					■	■	■	■			■	■	■	■	■	
	125		1.20																				
	155		1.50																				
	185		1.80																				
	225		2.20									■	■						■	■	■		
	335		3.30																				
	475		4.70									■							■	■			
	685		6.80																				
	106		10.0uF															■	■	■			
	156		15.0uF																				
	226		22.0uF																				
	476		47.0uF																				
	107		100.0uF																				

* For values above 1uF, thickness may be greater than specified above.
T(max): 0603 – 0.040"
0805 – 0.060"

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.
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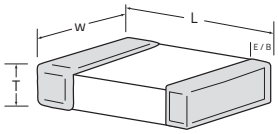
Voltage and Capacitance Range

X7R Dielectric



Values that are typically available.

(All measurements in inches)

Size			1206 (± 0.008)					1210 (±0.008)					1812 (±0.012)						2220 / 2221 °(±0.016)			
L			0.126					0.126					0.177						0.225 / .225			
W			0.063					0.098					0.126						0.200 / .210			
T (max)*			0.070					0.125					0.085						0.108 / .108			
Min E/B			0.020 ± .010					0.020 ± .010					.024 ± .015						00.025 ± .015			
VDCW (MAX)			10V	16V	25V	50V	100V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	16V	25V	50V	100V
CAPACITANCE CODE		CAPACITANCE VALUE																				
102		1000pF			■	■	■			■	■	■										
122		1200			■	■	■			■	■	■										
152		1500			■	■	■			■	■	■										
182		1800			■	■	■			■	■	■										
222		2200			■	■	■			■	■	■										
272		2700			■	■	■			■	■	■										
332		3300			■	■	■			■	■	■										
392		3900			■	■	■			■	■	■										
472		4700			■	■	■			■	■	■										
562		5600			■	■	■			■	■	■										
682		6800			■	■	■			■	■	■					■	■				
822		8200			■	■	■			■	■	■					■	■				
103		.01uF			■	■	■			■	■	■			■	■	■	■				
123		.012			■	■	■			■	■	■			■	■	■	■				
153		.015			■	■	■			■	■	■			■	■	■	■				
183		.018			■	■	■			■	■	■			■	■	■	■				
223		.022			■	■	■			■	■	■			■	■	■	■		■	■	■
273		.027			■	■	■			■	■	■			■	■	■	■		■	■	■
333		.033			■	■	■			■	■	■			■	■	■	■		■	■	■
393		.039			■	■	■			■	■	■			■	■	■	■		■	■	■
473		.047			■	■	■			■	■	■			■	■	■	■		■	■	■
563		.056			■	■	■			■	■	■			■	■	■	■		■	■	■
683		.068			■	■	■			■	■	■			■	■	■	■		■	■	■
823		.082			■	■	■			■	■	■			■	■	■	■		■	■	■
104		.100uF		■	■	■	■	■	■	■	■	■			■	■	■	■		■	■	■
124		.120		■	■	■		■	■	■	■	■			■	■	■	■		■	■	■
154		.150		■	■	■		■	■	■	■	■			■	■	■	■		■	■	■
184		.180		■	■	■		■	■	■	■	■			■	■	■	■		■	■	■
224		.220		■	■	■	■	■	■	■	■	■			■	■	■	■		■	■	■
274		.270		■	■	■		■	■	■	■	■			■	■	■	■		■	■	■
334		.330		■	■	■		■	■	■	■	■			■	■	■	■		■	■	■

* For values above 1uF, thickness may be greater than specified above.
T(max): 1206 – 0.075" 1812 – 0.130"
1210 – 0.125" 2220 – 0.135"

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.
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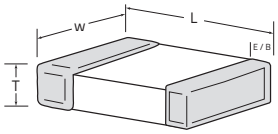
General Purpose Ceramic Capacitors (C Series)

Voltage and Capacitance Range

X7R Dielectric



Values that are typically available.

(All measurements in inches)

Size			1206 (± 0.008)						1210 (±0.008)						1812 (±0.012)						2220 / 2221 (±0.016)			
L			0.126						0.126						0.177						0.225 / .225			
W			0.063						0.098						0.126						0.200 / .210			
T (max)*			0.070						0.125						0.095						0.108 /.108			
Min E/B			0.020 ± .010						0.020 ± .010						0.024 ± .015						0.025 ± .015			
VDCW (MAX)			6.3V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	16V	25V	50V	100V
CAPACITANCE CODE		CAPACITANCE VALUE																						
	394	.390			■	■	■		■	■	■	■	■				■	■	■	■		■	■	■
	474	.470			■	■	■		■	■	■	■	■	■			■	■	■	■		■	■	■
	564	.560			■	■	■		■	■	■	■	■				■	■	■	■		■	■	■
	684	.680			■	■			■	■	■	■	■	■			■	■	■	■		■	■	■
	824	.820			■	■			■	■	■	■					■	■	■			■	■	■
	105	1.00uF	■	■	■	■	■	■	■	■	■	■	■	■			■	■	■	■		■	■	■
	125	1.20															■	■	■			■	■	■
	155	1.50	■	■	■	■	■		■	■	■	■										■		
	185	1.80																						
	225	2.20	■	■	■	■	■	■	■	■	■	■	■	■			■	■	■	■				
	335	3.30	■	■	■	■			■	■	■	■	■									■	■	
	475	4.70	■	■	■	■	■		■	■	■	■	■				■	■	■			■	■	■
	685	6.80																						
	106	10.0uF	■	■	■	■			■	■	■	■	■			■	■					■	■	■
	156	15.0uF																				X7S	X7S	X7S
	226	22.0uF	■	■					■	■	■	■				■					■			
	476	47.0uF							■	■														
	107	100.0uF																						

* For values above 1uF, thickness may be greater than specified above.
T(max): 1206 – 0.075" 1812 – 0.130"
1210 – 0.125" 2220 – 0.135"

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.
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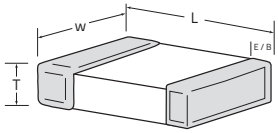
Rev. 01/2019-B

Voltage and Capacitance Range

X5R Dielectric



Values that are typically available.

(All measurements in inches)

Size	01005 (± 0.0008)		0201 (± 0.002)					0402 (± 0.004)						0603 (± 0.006)						0805 (± 0.008)					1206 (± 0.008)				1210 (±0.016)		1812 (±0.016)	
L	0.016		0.024					0.040						0.063						0.080					0.126				0.126		0.177	
W	0.008		0.012					0.020						0.032						0.050					0.063				0.098		0.126	
T (max)	0.008		0.012					0.025						0.040						0.060					0.072				0.125		0.130	
Min. E/B	0.002		0.002					0.004						0.008						0.020 ± .010					0.020 ± .010				0.020 ± .010		0.024 ± .015	
VDCW (MAX)	6.3V	10V	4V	6.3V	10V	16V	25V	4V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	35V	50V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	16V	25V	16V	25V
CAPACITANCE CODE / CAPACITANCE VALUE																																
102 / 1000pF	■																															
122 / 1200																																
152 / 1500	■																															
182 / 1800																																
222 / 2200	■	■																														
272 / 2700																																
332 / 3300	■																															
392 / 3900																																
472 / 4700	■																															
562 / 5600																																
682 / 6800	■																															
822 / 8200																																
103 / .01uF	■						■																									
153 / .015				■																												
223 / ,022				■																												
333 / .033				■																												
393 / .039				■																												
473 / .047				■																												
104 / 0.10uF	■			■	■	■			■	■	■	■	■																			
154 / .150									■	■																						
224 / .220			■	■	■				■	■		■																				
334 / .330									■																							
474 / .470				■	■				■	■	■	■					■															
684 / .680														■	■																	
105 / 1.00uF			■	■	■	■			■	■	■	■		■	■	■	■	■		■	■	■	■		■	■	■	■				
125 / 1.20																																
155 / 1.50																																
185 / 1.80																																
225 / 2.20			■	■	■			■	■	■	■			■	■	■	■			■	■	■	■	■	■	■	■	■				
335 / 3.30								■	■					■	■						■	■							■	■	■	■

For values above 1uF, thickness may be greater than specified above.
T(max): 1206 – 0.075" 1812 – 0.130"
1210 – 0.125" 2220 – 0.135"

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.
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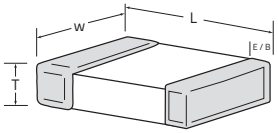
General Purpose Ceramic Capacitors (C Series)

Voltage and Capacitance Range



Values that are typically available.

X5R Dielectric (0402 - 1206)

(All measurements in inches)

Size			0201 (± 0.002)			0402 (± 0.008)				0603 (± 0.006)					0805 (± 0.008)						1206 (± 0.008)				
L			0.024			0.040				0.063					0.080						0.126				
W			0.012			0.020				0.032					0.050						0.063				
T (max)			0.0216			0.0335				0.040					0.060						0.072				
Min E/B			0.002			0.004				0.008					0.020 ± .010						0.020 ± .010				
VDCW (MAX)			4V	6.3V	10V	4V	6.3V	10V	16V	4V	6.3V	10V	16V	25V	4V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V
CAPACITANCE CODE	CAPACITANCE VALUE																								
395	3.90uF																								
475	4.70uF	■	■		■	■	■	■		■	■	■			■	■	■	■	■	■	■	■	■	■	■
685	6.80uF																								
106	10.0uF				■	■	■		■	■	■	■	■		■	■	■	■		■	■	■	■	■	■
156	15.0uF																								
226	22.0uF				■	■			■	■	■				■	■	■	■		■	■	■	■		
476	47.0uF								■	■				■	■	■				■	■	■	■		
107	100.0uF													■						■	■				
157	150.0uF																								
227	220.0uF																			■					

X5R Dielectric (1210 - 2221)

(All measurements in inches)

Size			1210 (±0.016)					1812 (±0.016)				2220 / 2221 (±0.016)			
L			0.126					0.177				0.225 / .225			
W			0.098					0.126				0.200 / .210			
T (max)			0.125					0.130				0.135			
Min E/B			0.020 ± .010					0.024 ± .015				0.025 ± .015			
VDCW (MAX)			6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	6.3V	10V	25V	50V
CAPACITANCE CODE	CAPACITANCE VALUE														
395	3.90uF														
475	4.70uF		■	■	■	■	■		■	■	■				
685	6.80uF														
106	10.0uF		■	■	■	■	■		■	■	■			■	■
156	15.0uF													■	
226	22.0uF		■	■	■	■		■	■	■	■				
476	47.0uF		■	■	■			■	■			■	■		
107	100.0uF		■					■				■			
157	150.0uF		■												
227	220.0uF		■												

For values above 1uF, thickness may be greater than specified above.
T(max): 1206 – 0.075" 1812 – 0.130"
1210 – 0.125" 2220 – 0.135"

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.
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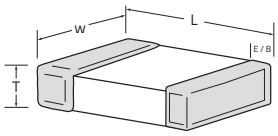
Voltage and Capacitance Range

Z5U Dielectric



Values that are typically available.

(All measurements in inches)

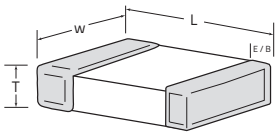
Size			0504 (± 0.008)		0603 (± 0.006)		0805 (± 0.008)		1206 (± 0.008)		1210 (±0.016)		1812 (±0.016)		2220 / 2221 (±0.016)	
L			0.050		0.063		0.080		0.126		0.126		0.177		0.225 / .225	
W			0.040		0.032		0.050		0.063		0.098		0.126		0.200 / .210	
T (max)			0.040		0.038		0.058		0.070		0.075		0.085		0.108 /.108	
Min E/B			0.005		0.008		0.020 ± .010		0.020 ± .010		0.020 ± .010		0.024 ± .015		0.025 ± .015	
VDCW (MAX)			25V	50V	25V	50V	25V	50V	25V	50V	25V	50V	25V	50V	25V	50V
CAPACITANCE CODE		CAPACITANCE VALUE														
102		1000pF	■	■												
122		1200	■	■												
152		1500	■	■												
182		1800	■	■												
222		2200	■	■												
272		2700	■	■												
332		3300	■	■												
392		3900	■	■												
472		4700	■	■			■									
562		5600	■	■			■	■								
682		6800	■	■			■	■								
822		8200	■	■			■	■								
103		.01uF	■	■	■	■	■	■	■	■	■	■				
123		.012	■	■	■	■	■	■	■	■	■	■				
153		.015	■	■	■	■	■	■	■	■	■	■				
183		.018	■	■	■	■	■	■	■	■	■	■				
223		.022	■	■	■	■	■	■	■	■	■	■				
273		.027	■	■	■	■	■	■	■	■	■	■				
333		.033	■	■	■	■	■	■	■	■	■	■				
393		.039	■	■	■	■	■	■	■	■	■	■				
473		.047	■	■	■	■	■	■	■	■	■	■				
563		.056	■		■	■	■	■	■	■	■	■				
683		.068	■		■	■	■	■	■	■	■	■				
823		.082	■		■	■	■	■	■	■	■	■				
104		.100uF	■		■	■	■	■	■	■	■	■	■	■		
124		.120			■		■	■	■	■	■	■	■	■		
154		.150			■		■	■	■	■	■	■	■	■	■	■
184		.180			■		■	■	■	■	■	■	■	■	■	■
224		.220			■		■	■	■	■	■	■	■	■	■	■
274		.270					■	■	■	■	■	■	■	■	■	■
334		.330			■		■	■	■	■	■	■	■	■	■	■

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

General Purpose Ceramic Capacitors (C Series)

Voltage and Capacitance Range

Z5U Dielectric



Values that are typically available.

(All measurements in inches)

Size			0504 (± 0.008)		0603 (± 0.006)		0805 (± 0.008)		1206 (± 0.008)		1210 (±0.016)		1812 (±0.016)		2220 / 2221 (±0.016)	
L			0.050		0.063		0.080		0.126		0.126		0.177		0.225 / .225	
W			0.040		0.032		0.050		0.063		0.098		0.126		0.200 / .210	
T (max)			0.040		0.038		0.058		0.070		0.075		0.085		0.108 /.108	
Min E/B			0.005		0.008		0.020 ± .010		0.020 ± .010		0.020 ± .010		0.024 ± .015		0.025 ± .015	
VDCW (MAX)			25V	50V	25V	50V	25V	50V	25V	50V	25V	50V	25V	50V	25V	50V
CAPACITANCE CODE		CAPACITANCE VALUE														
	394	.390					■		■	■	■	■	■	■	■	■
	474	.470					■		■	■	■	■	■	■	■	■
	564	.560					■		■		■	■	■	■	■	■
	684	.680							■		■	■	■	■	■	■
	824	.820							■		■	■	■	■	■	■
	105	1.00uF							■		■	■	■	■	■	■
	125	1.20									■	■	■	■	■	■
	155	1.50									■	■	■	■	■	■
	185	1.80									■	■	■	■	■	■
	225	2.20									■		■	■	■	■
	335	3.30									■		■		■	■
	395	3.90									■				■	
	475	4.70									■				■	
	685	6.80														
	106	10.0uF														■
	156	15.0uF														
	226	22.0uF														
	476	47.0uF														
	107	100.0uF														

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available. For values above 1uF, thickness may be greater than specified above.

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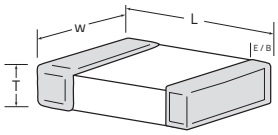
Rev. 01/2019-B

Voltage and Capacitance Range

Y5V Dielectric



Values that are typically available.

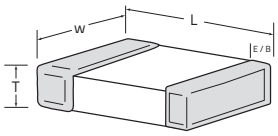
(All measurements in inches)

Size			0201 (± 0.002)	0402 (± 0.004)					0603 (± 0.006)					0805 (± 0.008)					1206 (± 0.008)				1210 (±0.016)				1812 (±0.016)		
L			0.024	0.040					0.063					0.080					0.126				0.126				0.177		
W			0.012	0.020					0.032					0.050					0.063				0.098				0.126		
T (max)			0.012	0.025					0.038					0.058					0.070				0.096				0.085		
Min E/B			0.002	0.004					0.008					0.020 ± .010					0.020 ± .010				0.020 ± .010				0.024 ± .015		
VDCW (MAX)			10V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	10V	16V	25V	50V	6.3V	10V	16V	25V	6.3V	10V	25V
CAPACITANCE CODE		CAPACITANCE VALUE																												
102		1000pF	■				■	■																						
122		1200					■	■																						
152		1500					■	■																						
182		1800					■	■																						
222		2200	■				■	■																						
272		2700					■	■																						
332		3300	■				■	■																						
392		3900					■	■																						
472		4700	■				■	■																						
562		5600					■	■																						
682		6800	■				■	■																						
822		8200					■	■																						
103		.01uF	■			■	■	■			■	■	■																	
123		.012				■	■				■	■	■																	
153		.015				■	■				■	■	■																	
183		.018				■	■				■	■	■																	
223		.022				■	■				■	■	■																	
273		.027				■	■				■	■	■																	
333		.033				■	■				■	■	■																	
393		.039				■	■				■	■	■					■												
473		.047				■	■				■	■	■					■												
563		.056				■	■				■	■	■					■												
683		.068				■	■				■	■	■					■												
823		.082				■	■				■	■	■					■												
104		.100uF		■	■	■	■		■	■	■	■	■			■	■	■			■	■								
124		.120							■	■	■	■				■	■	■			■	■								
154		.150							■	■	■	■				■	■	■			■	■								
184		.180							■	■	■	■				■	■	■			■	■								
224		.220		■	■	■			■	■	■	■	■			■	■	■			■	■								
274		.270									■	■				■	■	■			■	■								
334		.330		■	■						■	■				■	■	■			■	■			■	■				

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available. For values above 1uF, thickness may be greater than specified above.

Voltage and Capacitance Range

Y5V Dielectric



Values that are typically available.

(All measurements in inches)

Size			0201 (± 0.002)	0402 (± 0.004)			0603 (± 0.006)					0805 (± 0.008)					1206 (± 0.008)				1210 (±0.016)					1812 (±0.016)		
L			0.024	0.040			0.063					0.080					0.126				0.126					0.177		
W			0.012	0.020			0.032					0.050					0.063				0.098					0.126		
T (max)			0.012	0.025			0.038					0.058					0.070				0.10					0.085		
Min E/B			0.002	0.004			0.008					0.020 ± .010					0.020 ± .010				0.020 ± .010					0.024 ± .015		
VDCW (MAX)			10V	6.3V	10V	16V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	6.3V	10V	25V
CAPACITANCE CODE		CAPACITANCE VALUE																										
394		.390												■	■	■			■	■			■	■				
474		.470		■	■		■	■	■	■				■	■	■			■	■			■	■				
564		.560												■					■				■	■				
684		.680												■				■	■				■	■				
824		.820												■				■	■				■	■				
105		1.00uF		■			■	■	■	■		■	■	■	■	■	■	■	■				■	■			■	■
125		1.20																									■	■
155		1.50																■	■				■	■			■	■
185		1.80																									■	■
225		2.20					■	■	■			■	■	■	■		■	■	■				■	■			■	■
335		3.30										■	■					■	■				■	■			■	■
395		3.90																■					■	■			■	■
475		4.70					■	■				■	■	■	■		■	■	■				■	■			■	■
685		6.80																■					■	■				
106		10.0uF										■	■	■			■	■	■				■	■	■		■	■
156		15.0uF																										
226		22.0uF															■					■	■			■	■	
476		47.0uF																			■	■				■	■	
107		100.0uF																			■					■		

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available. For values above 1uF, thickness may be greater than specified above.

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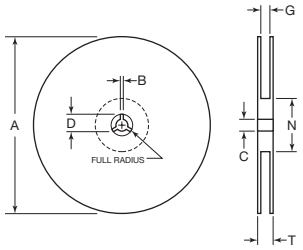
Rev. 01/2019-B

Tape and Reel Specifications

All tape and reel specifications must be adhered to per EIA-481-1-A.

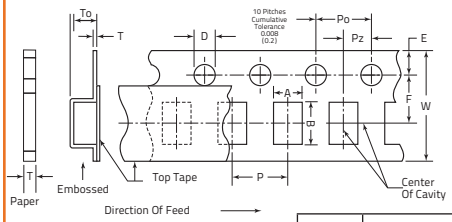


Reel Dimensions

Unit: mm (inch)

Tape	B min	C	A (7")	A (13")	D min	N min	G	T max
4mm	2.0 (0.079)	13 ± 0.05 (0.512 ± 0.02)	178 ±2.0 (7 ± 0.079)	-	21 ± 0.8 (0.82 ± 0.03)	50 (1.97)	5.0 ± 1.5 (0.196 ± 0.05)	8.0 max (0.315 max)
8mm	2.0 (0.07)	13 ± 0.05 (0.512 ± 0.02)	178 ±2.0 (7 ± 0.079)	330 ± 2.0 (13± 0.08)	20.2 (0.795)	50 (1.97)	10 ± 1.5 (0.394 ± 0.059)	14.9 (0.587)
12mm	2.0 (0.07)	13 ± 0.05 (0.512 ± 0.02)	178 ±2.0 (7 ± 0.079)	330 ± 2.0 (13± 0.08)	20.2 (0.795)	50 (1.97)	10 ± 1.5 (0.394 ± 0.059)	14.9 (0.587)

Taping Specifications



7 in. Reel Quantities**

Size	01005 (E)	01005 (P)	0201	0402	0603	0805	1206	1210	1812	2221
Tape Size	4mm	8mm	8mm	8mm	8mm	8mm	8mm	8mm	12mm	12mm
Min Qty Per Reel	40,000*	20000*	15,000	5,000	3,000	2,000	2,000	1,000	1,000	1,000
Max Qty Per Reel	40,000*	20000*	15,000	10,000	4,000	5,000	5,000	5,000	3,000	1,000

Note: ** Quantity dependent on thickness
*Smaller quantities may be available. Please contact us.

Unit: mm (inch)

Paper Tape Carrier Dimensions (8mm)

Size (inches)	A	B	W	F	E	Po	Pz	D	t	P
01005	0.25 ± 0.05 (0.010 ± .002)	0.45 ± 0.05 (0.018 ± .002)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 - 0.0 (.039 ± .002) - .000	1.5 + 0.1 (.064 + .004)	1.15 MAX (.045 MAX)	2.0 ± 0.05 (.079 ± .002)
0201	0.37 ± 0.05 (0.014 ± .002)	0.67 ± 0.05 (0.026 ± .002)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 - 0.0 (.039 ± .002) - .000	1.5 + 0.1 (.064 + .004)	1.15 MAX (.045 MAX)	2.0 ± 0.05 (.079 ± .002)
0402	0.65 ± 0.1 (.026 ± .004)	1.10 ± 0.2 (.043 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 - 0.0 (.039 ± .002) - .000	1.5 + 0.1 (.064 + .004)	1.15 MAX (.045 MAX)	2.0 ± 0.05 (.079 ± .002)
0603	1.10 ± 0.2 (.043 ± .008)	1.90 ± 0.2 (.075 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 - 0.0 (.039 ± .002) - .000	1.5 + 0.1 (.064 + .004)	1.15 MAX (.045 MAX)	4.0 ± 0.1 (.157 ± .004)
0805	1.16 ± 0.2 (.046 ± .008)	2.4 ± 0.2 (.095 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 - 0.0 (.039 ± .002) - .000	1.5 + 0.1 (.064 + .004)	1.15 MAX (.045 MAX)	4.0 ± 0.1 (.157 ± .004)
1206	2.0 ± 0.2 (.079 ± .008)	3.6 ± 0.2 (.142 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 - 0.0 (.039 ± .002) - .000	1.5 + 0.1 (.064 + .004)	1.15 MAX (.045 MAX)	4.0 ± 0.1 (.157 ± .004)

Embossed Carrier Dimensions (4mm, 8mm & 12mm)

Size (inches)	A	B	W	F	E	Po	Pz	D	To	T	P
01005	0.23 (0.009)	0.43 (0.016)	4.0 ± 0.05 (0.157 ± 0.002)	1.8 ± 0.02 (0.070 ± 0.001)	0.9 ± 0.05 (0.035 ± 0.002)	2.0 ± 0.04 (0.079 ± 0.001)	2.00 (0.079)	0.8 ± 0.04 (0.031 ± 0.001)	0.5 max (0.019 max)	0.15 ~0.4 (0.005 ~0.015)	1.00 (0.039)
0805	1.48 ± 0.2 (.058 ± .008)	2.3 ± 0.2 (.091 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± .0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.079 ± .002)	1.5 + 0.1 - 0.0 (.06 + .004) - .000	2.5 MAX (.098 MAX)	0.6 MAX (.024 MAX)	4.0 ± 0.1 (.157 ± .004)
1206	2.0 ± 0.2 (.079 ± .008)	3.6 ± 0.2 (.142 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± .0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.079 ± .002)	1.5 + 0.1 - 0.0 (.06 + .004) - .000	2.5 MAX (.098 MAX)	0.6 MAX (.024 MAX)	4.0 ± 0.1 (.157 ± .004)
1210	2.9 ± 0.2 (.114 ± .008)	3.6 ± 0.2 (.142 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± .0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.079 ± .002)	1.5 + 0.1 - 0.0 (.06 + .004) - .000	2.5 MAX (.098 MAX)	0.6 MAX (.024 MAX)	4.0 ± 0.1 (.157 ± .004)
1812	3.6 ± 0.2 (.142 ± .008)	4.9 ± 0.2 (.193 ± .008)	12.0 ± 0.3 (.472 ± .012)	5.6 ± .0.1 (.221 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.079 ± .002)	1.5 + 0.1 - 0.0 (.06 + .004) - .000	3.8 MAX (.150 MAX)	0.6 MAX (.024 MAX)	8.0 ± 0.1 (.315 ± .004)

Environmental Test Criteria

NO	ITEM		PERFORMANCE	TEST CONDITION		
1	APPEARANCE		NO ABNORMAL EXTERIOR APPEARANCE	THROUGH MICROSCOPE (X10)		
2	INSULATION RESISTANCE		10,000M OR 500M μF PRODUCT WHICHEVER IS SMALLER (RATED VOLTAGE IS BELOW 16V: 10,000M OR 100M μF)	RATED VOLTAGE SHALL BE APPLIED. MEASUREMENT TIME IS 60 - 120 RATED VOLTAGE TIME 60 SEC .		
3	WITHSTANDING VOLTAGE		NO DIELECTRIC BREAKDOWN OR MECHANICAL BREAKDOWN	CLASS I : 300% OF THE RATED VOLTAGE FOR 1-5 SEC, CLASS II: 250% OF THE RATED VOLTAGE FOR 1-5 SEC IS APPLIED WITH LESS THAN 50 mA CURRENT		
4	CAPACITANCE	CLASS I	WITHIN THE SPECIFIED TOLERANCE	CAPACITANCE	FREQUENCY	VOLTAGE
				1,000pF AND BELOW	1MHz ±10%	0.5 ~ 5 Vrms
				MORE THAN 1,000 pF	1kHz ± 10%	
		CLASS II	WITHIN THE SPECIFIED TOLERANCE	CAPACITANCE	FREQUENCY	VOLTAGE
				10μF AND BELOW	1kHz ± 10%	1.0 ± 0.2Vrms
				MORE THAN 10μF	120Hz ± 20%	0.5 ± 0.1Vrms
5	Q	CLASS I	OVER 30pF : Q 1,000 LESS THAN 30pF: Q 400 +20C (C: CAPACITANCE)	CAPACITANCE	FREQUENCY	VOLTAGE
				1,000pF AND BELOW	1MHz ±10%	0.5 ~ 5 Vrms
				MORE THAN 1,000 pF	1kHz ± 10%	
6	DISSIPATION FACTOR (TanΘ CLASS II)	CLASS II				

X7R, X6S, X5R

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤2.5%	≤3%	0201 (50V); 0603≥0.047uF 0805≥0.22uF; 1206≥0.47uF
		≤5%	0603≥1uF; 0805≥1uF; 1206≥4.7uF; 1210≥4.7uF
25V	≤2.5%	≤5%	0201≥0.01uF; 0805≥1uF; 1210≥4.7uF
		≤10%	0402≥0.10uF; 0603≥0.33uF; 0805≥2.2uF 1206≥4.7uF; 1210≥22uF
16V	≤3.5%	≤5%	0201≥0.01uF; 0402≥0.033uF; 0805≥0.68uF; 1206≥2.2uF; 1210≥4.7uF
		≤10%	0402≥0.47uF; 0603≥0.68uF; 0805≥2.2uF; 1206≥4.7uF; 1210≥22uF
10V	≤5%	≤10%	0402≥0.33uF; 0603≥0.33uF; 0805≥2.2uF; 1206≥2.2uF; 1210≥22uF
6.3V	≤10%		

Y5V, Z5U

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤5%	≤9%	0603≥0.1uF; 0805≥0.47uF; 1206≥4.7uF;
25V	≤5%	≤9%	0402≥0.047uF; 0603≥0.1uF; 0805≥0.33uF; 1206≥1uF; 1210≥4.7uF
16V	≤9%	≤12.5%	0603≥2.2uF; 0805≥3.3uF; 1206≥10uF; 1210≥22uF; 1812≥47uF
10V	≤12.5%	≤16%	0603≥2.2uF; 0805≥3.3uF; 1206≥4.7uF; 1210≥10uF; 1812≥47uF
6.3V	≤16%		

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Environmental Test Criteria

NO	ITEM		PERFORMANCE		TEST CONDITION	
7	CAPACITANCE TEMPERATURE COEFFICIENT	CLASS I	CHARACTERISTIC	TEMP. COEFFICIENT (PPM/°C)	THESE SYMMETRICAL TOLERANCE APPLY TO 2 POINT MEASUREMENT OF TEMPERATURE COEFFICIENT: ONE AT -25°C AND AT 85°C	
			COG/NPO	0 ± 60 (±30)	STEP	TEMPERATURE (°C)
				–150 ± 60	1	25 ± 2
				-220 ± 60	2	MIN RATED TEMP ± 2
				–330 ± 60	3	25 ± 2
				–470 ± 60	4	MAX RATED TEMP ± 2
				–750 ± 120	5	25 ± 2
				+350 ~ –1000		

NO	ITEM	PERFORMANCE	TEST CONDITION
8	TEMPERATURE CHARACTERISTICS	CLASS II	

CAPACITANCE CHANGE

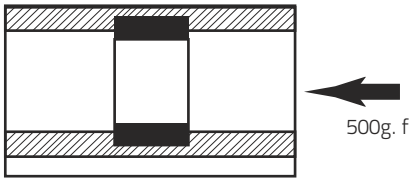
CHAR.		CAP. CHANGE (%)
X	X7R	±15%
	X6S	±22%
	X5R	±15%
Y	Y5V	-82% ~ +22%
	Z5U	-56% ~ +22%

STEP	TEMP. (°C) B	TEMP. (°C) F
1	25 ± 2	25 ± 2
2	-55 ± 2	-25 ± 2
3	25 ± 2	25 ± 2
4	125 ± 2	85 ± 2
5	25 ± 2	25 ± 2

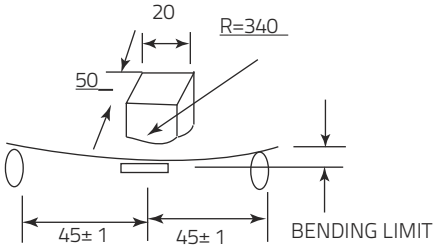
$$\frac{C2 - C1}{C1} \times 100\%$$

C1: CAPACITANCE AT STANDARD TEMPERATURE (25°C)
C2: CAPACITANCE AT EACH TEMPERATURE

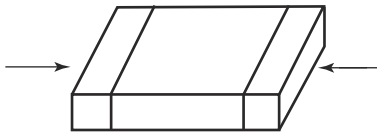
NO	ITEM	PERFORMANCE	TEST CONDITION
9	ADHESIVE STRENGTH OF TERMINATION	NO INDICATION OF PEELING SHALL OCCUR ON THE TERMINAL ELECTRODE	A 500g.f PRESSURE SHALL BE APPLIED FOR 10±1 SECOND



NO	ITEM		PERFORMANCE			TEST CONDITION
10	BENDING STRENGTH	APPEARANCE	NO MECHANICAL DAMAGE SHALL OCCURE			BENDING SHALL BE APPLIED TO THE LIMIT (1mm) WITH 0.3mm/SEC
		CAPACITANCE	CHARACTER	CHANGE OF CAPACITANCE		
			CLASS I		WITHIN ±5% OR ±0.5pF WHICHEVER IS LARGER	
			CLASS II	X (X7R, X6S, X5R)	WITHIN ±12.5%	
				Y (Y5V,Z5U)	WITHIN ±30%	



NO	ITEM	PERFORMANCE	TEST CONDITION
11	SOLDERABILITY	MORE THAN 95% OF THE TERMINAL SURFACE IS TO BE SOLDERED NEWLY, SO METAL PART (A) DOES NOT COME OUT OR DISSOLVE	SOLDER TEMPERATURE : 230 ± 5 ℃ SOLDER: H63A FLUX: ROSIN PRE-HEATING: AT 80 ~ 120 ℃ FOR 10 ~ 30 SEC.



Environmental Test Criteria

NO	ITEM		PERFORMANCE			TEST CONDITION
12	RESISTANCE TO SOLDERING HEAT	APPEARANCE	NO MECHANICAL DAMAGE SHALL OCCUR			DIP : SOLDER TEMPERATURE OF 270± 5 °C DIP TIME :10±1 SEC. EACH TERMINATION SHALL BE FULLY IMMERSED AND PREHEATED AS FOLLOWING: STEP / TEMP. (°C) / TIME (SEC.) 1 / 80~100 / 60 2 / 150~180 / 60 MEASURE AT ROOM TEMP. AFTER COOLING FOR CLASS I : 24 ± 2 HOURS CLASS II : 48 ± 4 HOURS
		CAPACITANCE	CHARACTERISTIC		CAP. CHANGE	
			CLASSS I		WITHIN ±2.5% OR ±0.25 pF WHICHEVER IS LARGER	
			CLASS II	X	WITHIN ±7.5%	
				Y	WITHIN ±20%	
		QCLASS I	30 pF AND OVER: Q 1000 LESS THAN 30 pF: Q 400 + 20xC			
		Tan CLASS II	TO SATISFY THE SPECIFIED INITIAL VLUE			
		INSULATION RESISTANCE	TO SATISFY THE SPECIFIED INITIAL VLUE			
		WITHSTANDING VOLTAGE	TO SATISFY THE SPECIFIED INITIAL VLUE			
13	VIBRATION TEST	APPEARANCE	NO MECHANICAL DAMAGE SHALL OCCUR			THE CAPACITOR SHALL BE SUBJECTED TO A HARMONIC MOTION HAVING A TOTAL AMPLITUDE of 1.5mm. THE ENTIRE FREQUENCY RANGE, FROM 10 TO 55Hz AND RETURN TO 10Hz SHALL BE TRAVERSED IN 1 MINUTE. THIS CYCLE SHALL BE PERFORMED 2 HOURS IN EACH THREE MUTUALLY PERPENDICULAR DIREC-TION, FOR TOTAL PERIOD of 6 HOURS.
		CAPACITANCE	CHARACTERISTIC		CAP. CHANGE	
			CLASSS I		WITHIN ±2.5% OR ±0.25 pF WHICHEVER IS LARGER	
			CLASS II	X	WITHIN ±5%	
				Y	WITHIN ±20%	
		QCLASS I	30 pF AND OVER: Q 1000 LESS THAN 30 pF: Q 400 + 20xC			
		Tan CLASS II	TO SATISFY THE SPECIFIED INITIAL VALUE			
		INSULATION RESISTANCE	TO SATISFY THE SPECIFIED INITIAL VALUE			

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Environmental Test Criteria

NO	ITEM		PERFORMANCE			TEST CONDITION
14	HUMIDITY (STEADY STATE)	APPEARANCE	NO MECHANICAL DAMAGE SHALL OCCUR			TEMPERATURE : 40±2 °C RELATIVE HUMIDITY: 90~95 %RH TEST TIME : 500 +12/-0 Hr. MEASURE AT ROOM TEMPERATURE AFTER COOLING FOR CLASS I : 24±2 Hr. CLASS II : 48±4 Hr. SEE (FIG.3)
		CAPACITANCE	CHARACTERISTIC		CAPACITANCE CHANGE	
			CLASS I		WITHIN ±5% OR±0.5pF WHICHEVER IS LARGER	
			CLASS II	X	WITHIN ±12.5%	
				Y	WITHIN ±30%	
		QCLASS I	30pF AND OVER : Q 350 10 ~ 30pF : Q 275 + 2.5xC LESS THAN 10pF : Q 200 + 10xC			
		DISSIPATION FACTOR (Tan Θ CLASS II)				
		INSULATION RESISTANCE	MINIMUM INSULATION RESISTANCE: 1,000 M OR 50M .µF PRODUCT WHICHEVER IS SMALLER			

X7R, X6S, X5R

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤2.5%	≤3%	0201 (50V); 0603≥0.047uF 0805≥0.22uF; 1206≥0.47uF
		≤5%	0603≥1uF; 0805≥1uF; 1206≥4.7uF; 1210≥4.7uF
25V	≤2.5%	≤5%	0201≥0.01uF; 0805≥1uF; 1210≥4.7uF
		≤10%	0402≥0.10uF; 0603≥0.33uF; 0805≥2.2uF 1206≥4.7uF; 1210≥22uF
16V	≤3.5%	≤5%	0201≥0.01uF; 0402≥0.033uF; 0805≥0.68uF; 1206≥2.2uF; 1210≥4.7uF
		≤10%	0402≥0.47uF; 0603≥0.68uF; 0805≥2.2uF; 1206≥4.7uF; 1210≥22uF
10V	≤5%	≤10%	0402≥0.33uF; 0603≥0.33uF; 0805≥2.2uF; 1206≥2.2uF; 1210≥22uF
6.3V	≤10%		

Y5V, Z5U

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤5%	≤9%	0603≥0.1uF; 0805≥0.47uF; 1206≥4.7uF;
25V	≤5%	≤9%	0402≥0.047uF; 0603≥0.1uF; 0805≥0.33uF; 1206≥1uF; 1210≥4.7uF
16V	≤9%	≤12.5%	0603≥2.2uF; 0805≥3.3uF; 1206≥10uF; 1210≥22uF; 1812≥47uF
10V	≤12.5%	≤16%	0603≥2.2uF; 0805≥3.3uF; 1206≥4.7uF; 1210≥10uF; 1812≥47uF
6.3V	≤16%		

Environmental Test Criteria

NO	ITEM		PERFORMANCE			TEST CONDITION
15	MOISTURE RESISTANCE	APPEARANCE	NO MECHANICAL DAMAGE SHALL OCCUR			APPLIED VOLTAGE: RATED VOLTAGE TEMPERATURE : 40±2 ℃ RELATIVE HUMIDITY: 90~95%RH TEST TIME : 500 +12/-0 Hr. CURRENT APPLIED: 50mA MAX. MEASURING AT ROOM TEMPERATURE AFTER COOLING FOR CLASS I : 24±2 Hr. CLASS II : 48±4 Hr. SEE (FIG.3)
		CAPACITANCE	CHARACTERISTIC		CAPACITANCE CHANGE	
			CLASS I		WITHIN ±7.5% OR±0.75pF WHICHEVER IS LARGER	
			CLASS II	X	WITHIN ±12.5%	
				Y	WITHIN ±30%	
		QCLASS I	30pF AND OVER : Q 200 30pF AND BELOW : Q 100 + 10/3xC			
		DISSIPATION FACTOR (Tan Θ CLASS II)				
		INSULATION RESISTANCE	MINIMUM INSULATION RESISTANCE: 100 M OR 25M .µF PRODUCT, WHICHEVER IS SMALLER			

X7R, X6S, X5R

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤2.5%	≤3%	0201 (50V); 0603≥0.047uF 0805≥0.22uF; 1206≥0.47uF
		≤5%	0603≥1uF; 0805≥1uF; 1206≥4.7uF; 1210≥4.7uF
25V	≤2.5%	≤5%	0201≥0.01uF; 0805≥1uF; 1210≥4.7uF
		≤10%	0402≥0.10uF; 0603≥0.33uF; 0805≥2.2uF 1206≥4.7uF; 1210≥22uF
16V	≤3.5%	≤5%	0201≥0.01uF; 0402≥0.033uF; 0805≥0.68uF; 1206≥2.2uF; 1210≥4.7uF
		≤10%	0402≥0.47uF; 0603≥0.68uF; 0805≥2.2uF; 1206≥4.7uF; 1210≥22uF
10V	≤5%	≤10%	0402≥0.33uF; 0603≥0.33uF; 0805≥2.2uF; 1206≥2.2uF; 1210≥22uF
6.3V	≤10%		

Y5V, Z5U

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤5%	≤9%	0603≥0.1uF; 0805≥0.47uF; 1206≥4.7uF;
25V	≤5%	≤9%	0402≥0.047uF; 0603≥0.1uF; 0805≥0.33uF; 1206≥1uF; 1210≥4.7uF
16V	≤9%	≤12.5%	0603≥2.2uF; 0805≥3.3uF; 1206≥10uF; 1210≥22uF; 1812≥47uF
10V	≤12.5%	≤16%	0603≥2.2uF; 0805≥3.3uF; 1206≥4.7uF; 1210≥10uF; 1812≥47uF
6.3V	≤16%		

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Environmental Test Criteria

NO	ITEM		PERFORMANCE			TEST CONDITION		
16	HIGH TEMPERATURE RESISTANCE	APPEARANCE	NO MECHANICAL DAMAGE SHALL OCCUR			APPLIED VOLTAGE: 150% OF RATED VOLTAGE TEST TIME : 1000 +48/-0 Hr. CURRENT APPLIED: 50mA MAX.		
		CAPACITANCE	CHARACTERISTIC		CAP. CHANGE			
			CLASS I		WITHIN ±3% OR ±0.3pF, WHICHEVER IS LARGER			
			CLASS II	X	WITHIN ±12.5%	CHAR.		TEMP.
				Y	WITHIN ±30%	CLASS I		125 ±3 ℃
		QCLASS I	30pF AND OVER : Q 350 10 - 30 pF : Q 275 + 2.5xC LESS THAN 10pF :Q 200 + I0xC			CLASS II	X	125 ±3 ℃
							Y	85 ±3 ℃
		DISSIPATION FACTOR (Tan Θ CLASS II)				(INITIAL VALUE MEASUREMENT) FOR CLASS II CAPACITORS, 150 % OF RATED VOLTAGE SHALL BE APPLIED FOR 1 HOUR AT THE MAXIMUM OPERATING TEMPERATURE, THEN KEEP IT AT ROOM TEMPERATURE. FOR 48 ±4 Hrs. SEE (FIG.3)		
		INSULATION RESISTANCE	MINIMUM INSULATION RESISTANCE: 1,000M OR 50M.μF PRODUCT WHICHEVER IS SMALLER					

X7R, X6S, X5R

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤2.5%	≤3%	0201 (50V); 0603≥0.047uF 0805≥0.22uF; 1206≥0.47uF
		≤5%	0603≥1uF; 0805≥1uF; 1206≥4.7uF; 1210≥4.7uF
25V	≤2.5%	≤5%	0201≥0.01uF; 0805≥1uF; 1210≥4.7uF
		≤10%	0402≥0.10uF; 0603≥0.33uF; 0805≥2.2uF 1206≥4.7uF; 1210≥22uF
16V	≤3.5%	≤5%	0201≥0.01uF; 0402≥0.033uF; 0805≥0.68uF; 1206≥2.2uF; 1210≥4.7uF
		≤10%	0402≥0.47uF; 0603≥0.68uF; 0805≥2.2uF; 1206≥4.7uF; 1210≥22uF
10V	≤5%	≤10%	0402≥0.33uF; 0603≥0.33uF; 0805≥2.2uF; 1206≥2.2uF; 1210≥22uF
6.3V	≤10%		

Y5V, Z5U

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤5%	≤9%	0603≥0.1uF; 0805≥0.47uF; 1206≥4.7uF;
25V	≤5%	≤9%	0402≥0.047uF; 0603≥0.1uF; 0805≥0.33uF; 1206≥1uF; 1210≥4.7uF
16V	≤9%	≤12.5%	0603≥2.2uF; 0805≥3.3uF; 1206≥10uF; 1210≥22uF; 1812≥47uF
10V	≤12.5%	≤16%	0603≥2.2uF; 0805≥3.3uF; 1206≥4.7uF; 1210≥10uF; 1812≥47uF
6.3V	≤16%		

Environmental Test Criteria

NO	ITEM		PERFORMANCE			TEST CONDITION
17	TEMPERATURE CYCLE	APPEARANCE	NO MECHANICAL DAMAGE SHALL OCCUR			CAPACITORS SHALL BE SUBJECTED TO FIVE CYCLES OF THE TEMPERATURE CYCLE AS FOLLOWING
		CAPACITANCE	CHARACTERISTIC		CAP. CHANGE	
			CLASS I		WITHIN ±2.5% OR ±0.25pF WHICHEVER IS LARGER	STEP / TEMP.(℃) / TIME (MIN)
			CLASS II	X	WITHIN ±7.5%	1 / MIN. RATED TEMP. +0/−3 / 30
				Y	WITHIN ±20%	
		QCLASS I	30 pF AND OVER : Q 1000 LESS THAN 3OpF:Q 400 +20xC			2 / 25 / 2 ~ 3
		TAN CLASS II				3 / MAX. RATED TEMP. +3/−0 / 30
						4 / 25 / 2 ~ 3
		INSULATION RESISTANCE	TO SATISFY THE SPECIFIED INITIAL VALUE			MEASURE AT ROOM TEMPERATURE AFTER COOLING FOR CLASS I : 24±2 Hr. CLASS II : 48±4 Hr. SEE(FIG.3)

X7R, X6S, X5R

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤2.5%	≤3%	0201 (50V); 0603≥0.047uF 0805≥0.22uF; 1206≥0.47uF
		≤5%	0603≥1uF; 0805≥1uF; 1206≥4.7uF; 1210≥4.7uF
25V	≤2.5%	≤5%	0201≥0.01uF; 0805≥1uF; 1210≥4.7uF
		≤10%	0402≥0.10uF; 0603≥0.33uF; 0805≥2.2uF 1206≥4.7uF; 1210≥22uF
16V	≤3.5%	≤5%	0201≥0.01uF; 0402≥0.033uF; 0805≥0.68uF; 1206≥2.2uF; 1210≥4.7uF
		≤10%	0402≥0.47uF; 0603≥0.68uF; 0805≥2.2uF; 1206≥4.7uF; 1210≥22uF
10V	≤5%	≤10%	0402≥0.33uF; 0603≥0.33uF; 0805≥2.2uF; 1206≥2.2uF; 1210≥22uF
6.3V	≤10%		

Y5V, Z5U

Rated Voltage	D.F.	Exception of D.F.	
≥50V	≤5%	≤9%	0603≥0.1uF; 0805≥0.47uF; 1206≥4.7uF;
25V	≤5%	≤9%	0402≥0.047uF; 0603≥0.1uF; 0805≥0.33uF; 1206≥1uF; 1210≥4.7uF
16V	≤9%	≤12.5%	0603≥2.2uF; 0805≥3.3uF; 1206≥10uF; 1210≥22uF; 1812≥47uF
10V	≤12.5%	≤16%	0603≥2.2uF; 0805≥3.3uF; 1206≥4.7uF; 1210≥10uF; 1812≥47uF
6.3V	≤16%		

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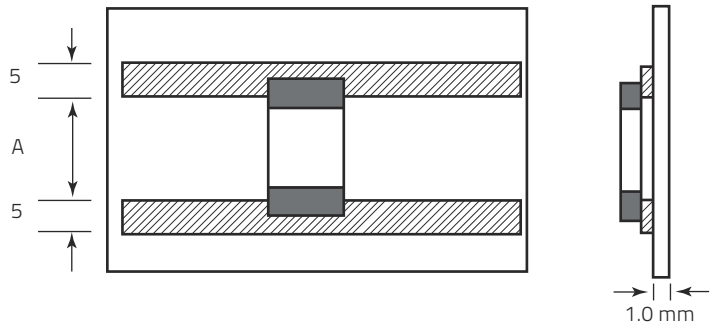
Adhesive Strength of Termination

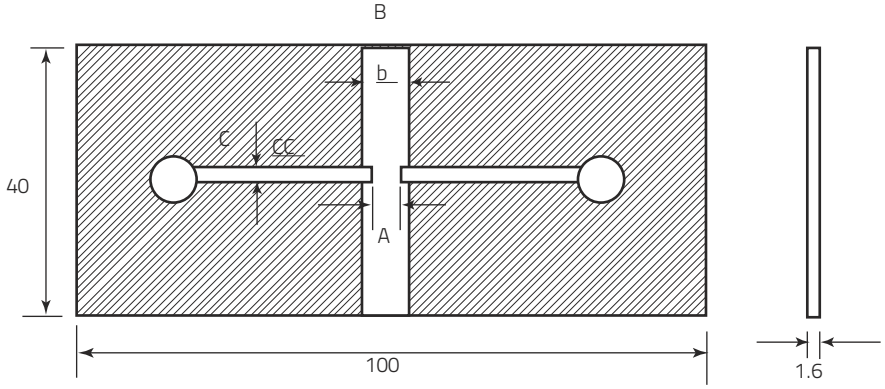


CODE	DIMENSION (mm)	A (mm)	CODE	DIMENSION (mm)	A (mm)
01005 (0402)	0.40 x 0.20	0.12	1206 (3216)	3.2 x 1.6	2.2
0201 (0603)	0.61 x 0.31	0.2	1210 (3225)	3.2 x 2.5	2.2
0402 (1005)	1.0 x 0.5	0.4	1812 (4532)	4.5 x 3.2	3.5
0603 (1608)	1.6 x 0.8	1.0	2220 (5750)	5.7 x 5.08	4.7
0805 (2012)	2.0 x 1.25	1.2			

MATERIAL: ALUMINA SUBSTRATE (Al2O3 95% min) OR GLASS EPOXY SUBSTRATE

COPPER FOIL (t = 0.035mm)

Substrate Bending Strength



(UNIT: mm)

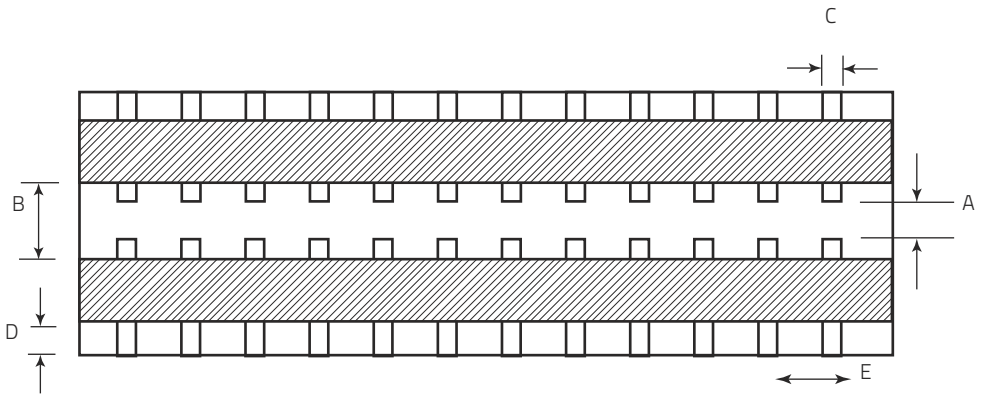
CODE	DIMENSION (mm)	A (mm)	B (mm)	C (mm)
01005 (0402)	0.40 x 0.20	0.12	0.7	0.20
0201 (0603)	0.61 x 0.31	0.2	1.0	0.4
0402 (1005)	1.0 x 0.5	0.4	1.4	0.5
0603 (1608)	1.6 x 0.8	1.0	3.0	1.0
0805 (2012)	2.0 x 1.25	1.2	4.0	1.65
1206 (3216)	3.2 x 1.6	2.2	5.0	2.0
1210 (3225)	3.2 x 2.5	2.2	5.0	3.2
1812 (4532)	4.5 x 3.2	3.5	7.0	4.0
2220 (5750)	5.7 x 5.08	4.7	8.5	5.0

MATERIAL: GLASS EPOXY SUBSTRATE

COPPER FOIL (t = 0.035mm)

SOLDER RESIST

Test Substrate



(UNIT: mm)

CODE	DIEMNSION (mm)	A	B	C	D	E
0201 (0603)	0.61 x 0.31	0.2	1.0	0.4	7.5	3.6
0402 (1005)	1.0 x 0.5	0.4	1.4	0.5	7.5	3.8
0603 (1608)	1.6 x 0.8	1.0	3.0	0.7	7.5	4.0
0805 (2012)	2.0 x 1.25	1.2	4.0	1.0	7.5	4.2
1206 (3216)	3.2 x 1.6	2.2	5.0	1.3	7.5	4.6
1210 (3225)	3.2 x 2.5	2.2	5.0	2.0	7.5	5.5
1812 (4532)	4.5 x 3.2	3.5	7.0	2.7	7.5	6.2
2220 (5750)	5.7 x 5.08	4.7	8.5	3.4	7.5	7.0

MATERIAL: GLASS EPOXY SUBSTRATE

COPPER FOIL (t = 0.035mm)

SOLDER RESIST

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