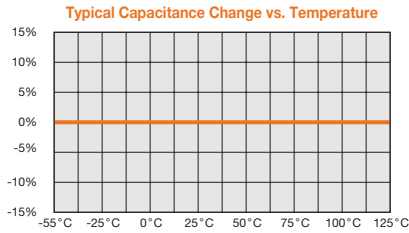


Ceramic Chip Capacitors

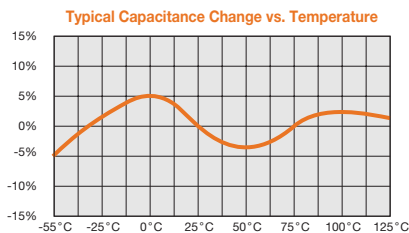
Multilayer chip capacitors have a low residual inductance, an excellent frequency response and minimal stray capacitance since there are no leads. These characteristics enable design to be very close to the theoretical values of the capacitors.

NP0/C0G: SPECIFICATIONS:



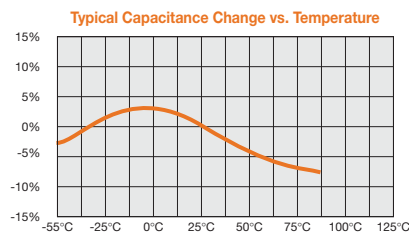
OPERATING TEMPERATURE RANGE:	-55°C to +125°C
TEMPERATURE COEFFICIENT:	0 ±30PPM/°C
TEMPERATURE VOLTAGE COEFFICIENT:	0 ±30PPM/°C
DISSIPATION FACTOR:	0.1% MAX.
INSULATION RESISTANCE:	>1000 ohms F or 100 G ohms, whichever is less at 25°C, VDCW. (The IR at 125°C is 10% of the value at 25°C)
AGEING:	None
WITHSTANDING VOLTAGE:	>2.5 times VDCW
TEST PARAMETERS:	1MHz ± 100KHz at 1.0 ± 0.2 Vrms ≤ 100 pF, 25°C 1KHz ± 100Hz at 1.0 ± 0.2 Vrms > 100 pF, 25°C
CAPACITANCE TOLERANCE:	B,C,D,F,G,J,K

X7R: SPECIFICATIONS:



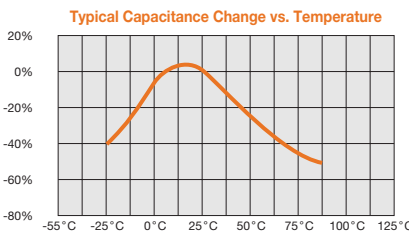
OPERATING TEMPERATURE RANGE:	-55°C to +125°C
TEMPERATURE COEFFICIENT:	0 ±15%Δ°C MAX.
TEMPERATURE VOLTAGE COEFFICIENT:	X7R not applicable
DISSIPATION FACTOR:	For 50 volts and 100 volts: 2.5% MAX.; For 25 Volts 3.5 % (0201, 0402, 0603, sizes If 7% Max, for Values ≥ 0.33uF) for 16 Volts: 3.5% Max (except 0402 ≥ 0.33uF & 0603 ≥ 0.15uF DF is 5% Max) For 10 Volts: 5% Max For 6.3 Volts: 10% Max For Values ≥ 10uF For all voltage offerings, the DF is 10% Max
INSULATION RESISTANCE:	>1000 ohms F or 100 G ohms, 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
TEST PARAMETERS:*	1KHz ± 100Hz at 1.0 ± 0.2 Vrms > 100 pF, 25°C
CAPACITANCE TOLERANCE:	J,K,M

X5R: SPECIFICATIONS:



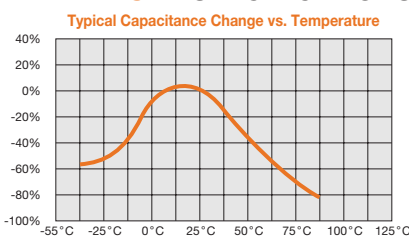
OPERATING TEMPERATURE RANGE:	-55°C to +85°C
TEMPERATURE COEFFICIENT:	0 ±15%Δ°C MAX.
TEMPERATURE VOLTAGE COEFFICIENT:	X5R not applicable
DISSIPATION FACTOR:	For 50 Volts and 100 Volts 2.5% Max For 25 Volts: 3.5% Max (0201, 0402, 0603, ≥ 0.33uF DF is 7% Max) For 16 Volts: 3.5% Max (except 0402 ≥ 0.33uF & 0603 ≥ 0.15uF DF is 5% Max) For 10 Volts 5.0% Max; For 4.0 Volts and 6.3Volts: 10% Max For values ≥ 10uF the D.F. is 10% Max.
INSULATION RESISTANCE:	>1000 ohms F or 100 G ohms, whichever is less at 25°C, VDCW. (10,000 ohms at 125°C)
AGEING:	2.5% per decade hour, typical
WITHSTANDING VOLTAGE:	>2.5 times VDCW
TEST PARAMETERS:*	1KHz ± 100Hz at 1.0 ± 0.2 Vrms > 100 pF, 25°C
CAPACITANCE TOLERANCE:	K,M

Z5U: SPECIFICATIONS:



OPERATING TEMPERATURE RANGE:	+10°C to +85°C
TEMPERATURE COEFFICIENT:	+22% - 56%Δ°C MAX.
DISSIPATION FACTOR:	4.0% MAX.
INSULATION RESISTANCE:	>100 ohms F or 10 G ohms, whichever is less at 25°C, VDCW.
AGEING:	5% per decade hour, typical
WITHSTANDING VOLTAGE:	>2.5 times VDCW
TEST PARAMETERS:	1KHz ± 100Hz at 0.5 ± 0.1 Vrms, 25°C
CAPACITANCE TOLERANCE:	M,Z

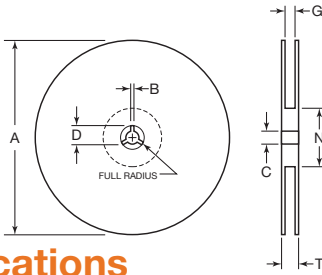
Y5V: SPECIFICATIONS:



OPERATING TEMPERATURE RANGE:	-30°C to +85°C
TEMPERATURE COEFFICIENT:	+22% - 82%Δ°C MAX.
DISSIPATION FACTOR:	For 25 volts and 50 volts: 5% MAX.; For 16 volts: 7% MAX.; For 10 volts: 9% MAX.; For 6.3 volts: 11% MAX. For higher Cap values > 10µF, the D.F. is 20% MAX.
INSULATION RESISTANCE:	>100 ohms F or 10 G ohms, whichever is less at 25°C, VDCW.
AGEING:	7% per decade hour, typical
WITHSTANDING VOLTAGE:	>2.5 times VDCW
TEST PARAMETERS:*	1KHz ± 100Hz at 1.0 ± 0.2 Vrms, 25°C
CAPACITANCE TOLERANCE:	M,Z

* Test parameters for High Value Caps - X7R, X5R and Y5V:
1KHz ± 100Hz at 1.0 ± 0.2 Vrms < 10uF (10 V min.)
1KHz ± 100Hz at 0.5 ± 0.1 Vrms < 10uF (6.3V max.)
120Hz ± 24Hz at 0.5 ± 0.1 Vrms ≥ 10uF

All tape and reel specifications must be adhered to per EIA-481-1-A as noted and stated in the Chip Resistor section on page 68.

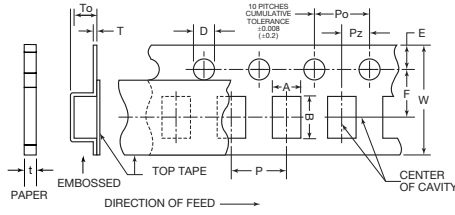


Reel Dimensions

Unit: mm (inch)

TAPE	B min	C	A (7")	A (13")	D min	N min	G	T max
8mm	0.3 (.012)	13 ± .05 (.512 ± .02)	178 ± 2.0 (7 ± .079)	330 ± 2.0 (13 ± .08)	20.2 (.795)	50 (1.97)	10 ± 1.5 (.394 ± .059)	14.9 (.587)
12mm	0.3 (.012)	13 ± .05 (.512 ± .02)	178 ± 2.0 (7 ± .079)	330 ± 2.0 (13 ± .08)	20.2 (.795)	50 (1.97)	10 ± 1.5 (.394 ± .059)	14.9 (.587)

Taping Specifications



7 in. Reel Quantities**

SIZE	01005	0201*	0402*	0603	0805	1206	1210	1812	2221
TAPE SIZE	8mm	8mm	8mm	8mm	8mm	8mm	8mm	12mm	12mm
MIN QTY PER REEL	20,000†	15,000	5000	3000	2000	2000	1000	1000	1000
MAX QTY PER REEL	20,000†	15,000	10,000	4000	5000	5000	5000	3000	1000

** Quantity dependent on Chip Thickness

* 0201 and 0402 Pitch ("P") is .079" ± .004" (2.0 ± 0.1mm)

† Smaller quantities may be available. Please contact your sales person.

Paper Tape Carrier Dimensions

(8mm)

SIZE	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 (.039 ± .002)	1.5 + 0.1 - 0.0 (.064 + .004 - .000)	1.15 MAX (.045 MAX)	2.0 ± 0.05 (.079 ± .002)
	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 (.039 ± .002)	1.5 + 0.1 - 0.0 (.064 + .004 - .000)	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 (.039 ± .002)	1.5 + 0.1 - 0.0 (.064 + .004 - .000)	1.15 MAX (.045 MAX)	2.0 ± 0.05 (.079 ± .002)
	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 (.079 ± .002)	1.5 + 0.1 - 0.0 (.064 + .004 - .000)	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 (.079 ± .002)	1.5 + 0.1 - 0.0 (.064 + .004 - .000)	1.15 MAX (.045 MAX)	4.0 ± 0.1 (.157 ± .004)
	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 (.064 + .004 - .000)	1.15 MAX (.045 MAX)	4.0 ± 0.1 (.157 ± .004)

Unit: mm (inch)

Embossed Carrier Dimensions

(8mm & 12mm)

SIZE	A	B	W	F	E	Po	Pz	D	To	T	P
0805	1.48 ± 0.2 (.058 ± .008)	2.3 ± 0.2 (.091 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± .01 (.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)
	2.0 ± 0.2 (.079 ± .008)	3.6 ± 0.2 (.142 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± .01 (.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 ± .01 (.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)
	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)

How To Order

C0805 Series
COG Temperature Characteristic
500 Rated Voltage
- 1st two digits are significant followed by number of zeroes.
101 Capacitance (pico - Farads)
101 1st two digits are significant, followed by number of zeroes.
101 = 100 pF
R denotes decimal
6R8 = 6.8 pF

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
201 = 200 VDCW
251 = 250 VDCW

J Tolerance Code:
*B = ± 0.1 pF
*C = ± 0.25 pF
*D = ± 0.5 pF
F = ± 1%
G = ± 2%
J = ± 5%
K = ± 10%
M = ± 20%
N = ± 30%
Z = +80 - 20%
P = +100 - 0%

* For capacitance values below 10 pF only. 10 pF also avail. in C & D Tol.

N Termination
N = Nickel Barrier, Tinned Termination
Composition is 100% matte Tin (Sn)
‡ P = Palladium Silver
‡ G = Gold over Nickel
Pb: 90% Tin (Sn)/10% Lead (Pb) Termination

Standard termination finish for this product is 100% matte Tin (Sn). If a 100% Tin designation is required, replace the N with Sn.

‡ Pd/Ag & Gold terminations have limited values available. Please consult your salesperson.

P Marking**
6 = EIA "J" Code
"Leave blank if No Marking"

P Packaging
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)

** 0201,0402 and 0603 size capacitors cannot be marked

* **OPTIONAL IDENTIFIER**
Min./Max. thickness
- designates minimum thickness
* designates maximum thickness

The following letters define thickness as signified below:

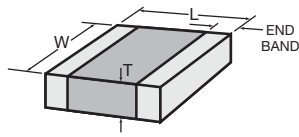
CODE:	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	6
DIMENSION:	.015	.020	.026	.030	.035	.040	.045	.050	.055	.060	.065	.070	.075	.080	.085	.090	.095	.100	.105	.110	.023

Please Note: Venkel offers Engineering Kits for this product. See page 124 for details.

NOTE: See the Web site for soldering information. 0603 size and smaller are not recommended for wave soldering.

Ceramic Chip Capacitors

NP0/C0G Dielectric



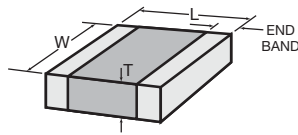
Values that are typically available.
 25V Available in 25V only.

(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)				
L	.016	.024		.040		.053		.063		.080		.126		.126		.177				
W	.008	.012		.020		.040		.032		.050		.063		.098		.126				
T (max)*	.008	.012		.025		.040		.033		.055		.070		.075		.085				
Min E/B	.002	.002		.004		.005		.008		.020 ± .010		.020 ± .010		.020 ± .010		.024 ± .015				
VDCW (MAX)	16V	25V	50V	25V	50V	50V	100V	50V	100V	25V	50V	100V	50V	100V	50V	100V	50V	100V		
OR1	0.1pF																			
OR2	0.2pF																			
OR3	0.3pF																			
OR4	0.4pF																			
OR5	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																			
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																			

Note: * For additional values that may be available, please consult your salesperson.

Ceramic Chip Capacitors

NP0/COG Dielectric



Values that are typically available.
 25V Available in 25V only.

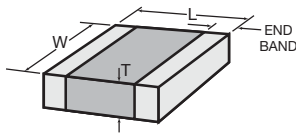
(All measurements in inches)		□		□		□		□		□		□		□		□		□	
Size	0201 (± 0.002)	0402 (± 0.004)	0504 (± 0.008)	0603 (± 0.006)	0805 (± 0.008)	1206 (± 0.008)	1210 (± 0.008)	1812 (± 0.012)	2220 / 2221 (± 0.016)										
L	.024	.040	.053	.063	.080	.126	.126	.177	.225 / .225										
W	.012	.020	.040	.032	.050	.063	.098	.126	.200 / .210										
T (max)*	.012	.025	.040	.033	.055	.070	.075	.085	.108 / .108										
Min E/B	.002	.004	.005	.008	.020 ± .010		.020 ± .010		.024 ± .015										
VDCW (MAX)	25V	25V	50V	50V	100V	25V	50V	25V	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V	
392	3900																		
472	4700																		
562	5600																		
682	6800																		
822	8200																		
103	.01µF																		
123	.012																		
153	.015																		
183	.018																		
223	.022																		
273	.027																		
333	.033																		
393	.039																		
473	.047																		
563	.056																		
683	.068																		
823	.082																		
104	.100µF											25V							
124	.120																		
154	.150																		
184	.180																		
224	.220																		
274	.270																		
334	.330																		
394	.390																		
474	.470																		
564	.560																		
684	.680																		
824	.820																		
105	1.00µF																		
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	10.0µF																		
156	15.0µF																		
226	22.0µF																		
476	47.0µF																		
107	100.0µF																		

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

X7R Dielectric



Values that are typically available.
 X5R Available in X5R only. See X5R chart on page 13, for all values 1µF and above

(All measurements in inches)

Size	01005 (± 0.0008)		0201 (± 0.002)				0402 (± 0.004)				0504 (± 0.008)			0603 (± 0.006)					0805 (± 0.008)						
	L	W	T (max)*	Min E/B	VDCW (MAX)	6.3V	10V	16V	25V	10V	16V	25V	50V	25V	50V	100V	10V	16V	25V	50V	100V	25V	50V	100V	
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	X5R																							
122	1200																								
152	1500	X5R																							
182	1800																								
222	2200	X5R																							
272	2700																								
332	3300	X5R																							
392	3900																								
472	4700	X5R																							
562	5600																								
682	6800	X5R																							
822	8200																								
103	.01µF	X5R																							
123	.012																								
153	.015			X5R																					
183	.018																								
223	.022			X5R																					
273	.027																								
333	.033			X5R																					

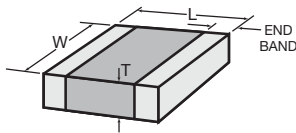
* For values above 1µF, thickness may be greater than specified above.
 T(max): 0603 – 0.040"
 0805 – 0.060"

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply. All components manufactured with the X7R dielectric are also available as an X5R dielectric.

Ceramic Chip Capacitors

X7R Dielectric



Values that are typically available.
 X5R Available in X5R only. See X5R chart on page 13, for all values 1µF and above

(All measurements in inches)		□			□					□					□						
Size		0201 (± 0.002)			0402 (± 0.004)					0603 (± 0.006)					0805 (± 0.008)						
L		.024			.040					.063					.080						
W		.012			.020					.032					.050						
T (max)*		.012			.025					.038					.058						
Min E/B		.002			.004					.008					.020 ± .010						
VDCW (MAX)		4V	6.3V	10V	4V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V
393	.039		X5R																		
473	.047		X5R																		
563	.056																				
683	.068																				
823	.082																				
104	.100µF		X5R						X5R												
124	.120																				
154	.150					X5R	X5R														
184	.180																				
224	.220	X5R				X5R	X5R														
274	.270																				
334	.330					X5R															
394	.390																				
474	.470					X5R	X5R							X5R							
564	.560																				
684	.680									X5R	X5R										
824	.820																				
105	1.00µF	X5R	X5R			X5R	X5R	X5R						X5R							
125	1.20																				
155	1.50																				
185	1.80																				
225	2.20					X5R	X5R						X5R								
335	3.30																X5R	X5R			
475	4.70									X5R	X5R									X5R	
685	6.80																				
106	10.0µF					X5R				X5R	X5R								X5R		
156	15.0µF																				
226	22.0µF																				
476	47.0µF																				
107	100.0µF																				

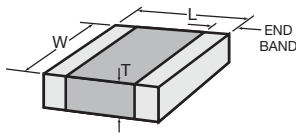
* For values above 1µF, thickness may be greater than specified above.
 T(max): 0603 – 0.040"
 0805 – 0.060"

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply. All components manufactured with the X7R dielectric are also available as an X5R dielectric.

Ceramic Chip Capacitors

X7R Dielectric



Values that are typically available.
 X5R Available in X5R only. See X5R chart on page 13, for all values 1µF and above

(All measurements in inches)																					
Size		1206 (± 0.008)					1210 (±0.008)					1812 (±0.012)					2220 / 2221 (±0.016)				
L		.126					.126					.177					.225 / .225				
W		.063					.098					.126					.200 / .210				
T (max)*		.070					.075					.085					.108 / .108				
Min E/B		.020 ± .010					.020 ± .010					.024 ± .015					.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
CAP. CODE	102	1000pF																			
	122	1200																			
	152	1500																			
	182	1800																			
	222	2200																			
	272	2700																			
	332	3300																			
	392	3900																			
	472	4700																			
	562	5600																			
CAP. VALUE	682	6800																			
	822	8200																			
	103	.01µF																			
	123	.012																			
	153	.015																			
	183	.018																			
	223	.022																			
	273	.027																			
	333	.033																			
	393	.039																			
CAP. VALUE	473	.047																			
	563	.056																			
	683	.068																			
	823	.082																			
	104	.10µF																			
	124	.120																			
	154	.150																			
	184	.180																			
	224	.220																			
	274	.270																			
334	.330																				

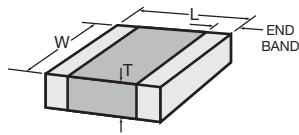
* For values above 1µF, thickness may be greater than specified above.
 T(max): 1206 - 0.075" 1812 - 0.130"
 1210 - 0.125" 2220 - 0.135"

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.
 All components manufactured with the X7R dielectric are also available as an X5R dielectric.

Ceramic Chip Capacitors

X7R Dielectric



Values that are typically available.
 X5R Available in X5R only. See X5R chart on page 13, for all values 1 μ F and above

(All measurements in inches)																							
Size		1206 (± 0.008)						1210 (± 0.008)						1812 (± 0.012)						2220 / 2221 (± 0.016)			
L		.126						.126						.177						.225 / .225			
W		.063						.098						.126						.200 / .210			
T (max)*		.070						.075						.095						.108 / .108			
Min E/B		.020 \pm .010						.020 \pm .010						.024 \pm .015						.025 \pm .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
CAP. CODE	394	.390																					
	474	.470																					
	564	.560																					
	684	.680																					
	824	.820																					
	105	1.00 μ F																					
	125	1.20																					
	155	1.50																					
	185	1.80																					
	225	2.20																					
	335	3.30																					
	475	4.70																					
	685	6.80																					
	106	10.0 μ F																					
	156	15.0 μ F																					
	226	22.0 μ F																					
	476	47.0 μ F																					
107	100.0 μ F																						

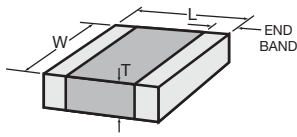
* For values above 1 μ F, thickness may be greater than specified above.
 T(max): 1206 - 0.072" 1812 - 0.130"
 1210 - 0.125" 2220 - 0.135"

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.
 All components manufactured with the X7R dielectric are also available as an X5R dielectric.

Ceramic Chip Capacitors

X5R Dielectric (1 μ F and above)



Values that are typically available.
For values less than 1 μ F, see X7R chart on pages 9–12.

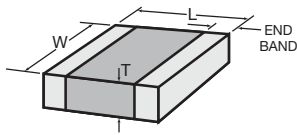
(All measurements in inches)		□				□				□				□				□				□					
Size	0201 (± 0.002)	0402 (± 0.004)				0603 (± 0.006)				0805 (± 0.008)				1206 (± 0.008)				1210 (± 0.016)				1812 (± 0.016)					
L	.024	.040				.063				.080				.126				.126				.177					
W	.012	.020				.032				.050				.063				.098				.126					
T (max)	.012	.025				.040				.060				.072				.125				.130					
Min E/B	.002	.004				.008				.020 ± .010				.020 ± .010				.020 ± .010				.024 ± .015					
VDCW (MAX)	4V	6.3V	4V	6.3V	10V	16V	4V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	6.3V	10V	16V	25V
CAP. CODE	105	1.00 μ F	Available																								
	125	1.20	Available																								
	155	1.50	Available																								
	185	1.80	Available																								
	225	2.20	Available																								
	335	3.30	Available																								

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply. All components manufactured with the X7R dielectric are also available as an X5R dielectric.

Ceramic Chip Capacitors

X5R Dielectric (1 μ F and above)



Values that are typically available.
For values less than 1 μ F, see X7R chart on pages 9–12.

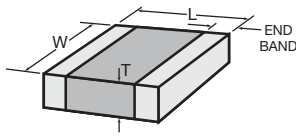
(All measurements in inches)		□		□			□					□					□					□							
Size	0402 (± 0.004)	0603 (± 0.006)			0805 (± 0.008)					1206 (± 0.008)					1210 (± 0.016)					1812 (± 0.016)					2220 / 2221 (± 0.016)				
L	.040	.063			.080					.126					.126					.177					.225 / .225				
W	.020	.032			.050					.063					.098					.126					.200 / .210				
T (max)	.025	.040			.060					.072					.125					.130					.135				
Min E/B	.004	.008			.020 \pm .010					.020 \pm .010					.020 \pm .010					.024 \pm .015					.025 \pm .015				
VDCW (MAX)	4V	6.3V	4V	6.3V	10V	4V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	6.3V	10V	25V	50V		
CAP. CODE ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑	395	3.90																											
	475	4.70	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
	685	6.80																											
	106	10.0 μ F	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
	156	15.0 μ F																										■	
	226	22.0 μ F			■	■	■			■	■			■	■			■	■			■	■	■	■	■	■	■	
	476	47.0 μ F						■	■				■	■			■	■			■	■	■	■	■	■	■	■	
	107	100.0 μ F											■									■					■		
157	150.0 μ F																												
227	220.0 μ F																												

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply. All components manufactured with the X7R dielectric are also available as an X5R dielectric.

Ceramic Chip Capacitors

Z5U Dielectric



Values that are typically available.

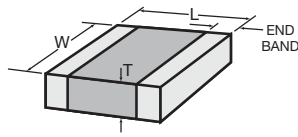
(All measurements in inches)		□		□		□		□		□		□		□			
Size		0504 (± 0.008)		0603 (± 0.006)		0805 (± 0.008)		1206 (± 0.008)		1210 (± 0.016)		1812 (± 0.016)		2220 / 2221 (± 0.016)			
L		.050		.063		.080		.126		.126		.177		.225 / .225			
W		.040		.032		.050		.063		.098		.126		.200 / .210			
T (max)*		.040		.038		.058		.070		.075		.085		.108 / .108			
Min E/B		.005		.008		.020 ± .010		.020 ± .010		.020 ± .010		.024 ± .015		.025 ± .015			
VDCW (MAX)		25V 50V		25V 50V		25V 50V		25V 50V		25V 50V		25V 50V		25V 50V			
CAP. CODE	102	CAP. VALUE	1000pF														
	122		1200														
	152		1500														
	182		1800														
	222		2200														
	272		2700														
	332		3300														
	392		3900														
	472		4700														
	562		5600														
682	6800																
822	8200																
103	.01μF																
123	.012																
153	.015																
183	.018																
223	.022																
273	.027																
333	.033																
393	.039																
473	.047																
563	.056																
683	.068																
823	.082																
104	.100μF																
124	.120																
154	.150																
184	.180																
224	.220																
274	.270																
334	.330																

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

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		.050		.063		.080		.126		.126		.177		.225 / .225		
W		.040		.032		.050		.063		.098		.126		.200 / .210		
T (max)*		.040		.038		.058		.070		.075		.085		.108 / .108		
Min E/B		.005		.008		.020 ± .010		.020 ± .010		.020 ± .010		.024 ± .015		.025 ± .015		
VDCW (MAX)		25V 50V		25V 50V		25V 50V		25V 50V		25V 50V		25V 50V		25V 50V		
CAP. CODE	394	.390														
	474	.470														
	564	.560														
	684	.680														
	824	.820														
	105	1.00µF														
	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	10.0µF														
	156	15.0µF														
	226	22.0µF														
	476	47.0µF														
107	100.0µF															

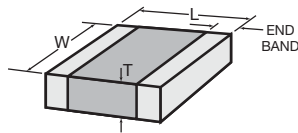
Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

* For values above 1µF, thickness may be greater than specified above. Please see X5R specifications.

Ceramic Chip Capacitors

Y5V Dielectric



Values that are typically available.

(All measurements in inches)

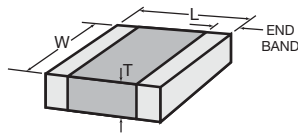
Size	0201 (± 0.002)	0402 (± 0.004)					0603 (± 0.006)					0805 (± 0.008)					1206 (± 0.008)					1210 (± 0.016)					1812 (± 0.016)				
L	.024	.040					.063					.080					.126					.126					.177				
W	.012	.020					.032					.050					.063					.098					.126				
T (max)*	.012	.025					.038					.058					.070					.075					.085				
Min E/B	.002	.004					.008					.020 ± .010					.020 ± .010					.020 ± .010					.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				
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	.01μF																														
123	.012																														
153	.015																														
183	.018																														
223	.022																														
273	.027																														
333	.033																														
393	.039																														
473	.047																														
563	.056																														
683	.068																														
823	.082																														
104	.100μF																														
124	.120																														
154	.150																														
184	.180																														
224	.220																														
274	.270																														
334	.330																														

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

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	.024	.040		.063		.080		.126		.126		.177														
W	.012	.020		.032		.050		.063		.098		.126														
T (max)*	.012	.025		.038		.058		.070		.075		.085														
Min E/B	.002	.004		.008		.020 ± .010		.020 ± .010		.020 ± .010		.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
394	.390																									
474	.470																									
564	.560																									
684	.680																									
824	.820																									
105	1.00µF																									
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	10.0µF																									
156	15.0µF																									
226	22.0µF																									
476	47.0µF																									
107	100.0µF																									

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

* For values above 1µF, thickness may be greater than specified above. Please see X5R specifications.

All components in this section are RoHS compliant per the EU directives and definitions.