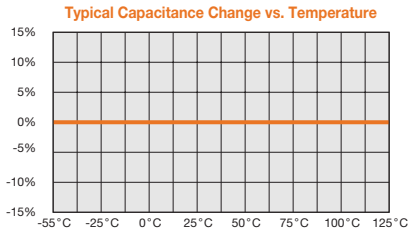


Ceramic Chip Capacitors

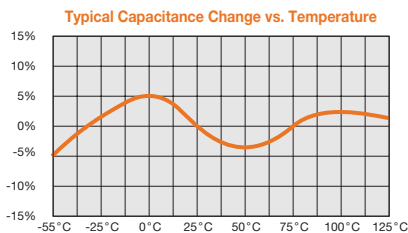
Multilayer chip capacitors have a low residual inductance, an excellent frequency response and minimal stray capacitance since there are no leads. These characteristics enable design to be very close to the theoretical values of the capacitors.

NP0/C0G: SPECIFICATIONS:



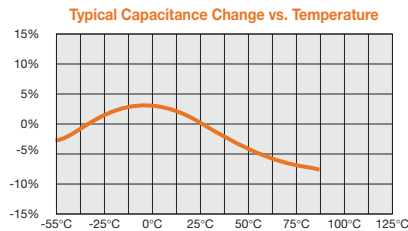
OPERATING TEMPERATURE RANGE:	-55°C to +125°C
TEMPERATURE COEFFICIENT:	0 ±30PPM/°C
TEMPERATURE VOLTAGE COEFFICIENT:	0 ±30PPM/°C
DISSIPATION FACTOR:	0.1% MAX.
INSULATION RESISTANCE:	>1000 ohms F or 100 G ohms, whichever is less at 25°C, VDCW. (The IR at 125°C is 10% of the value at 25°C)
AGEING:	None
WITHSTANDING 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:



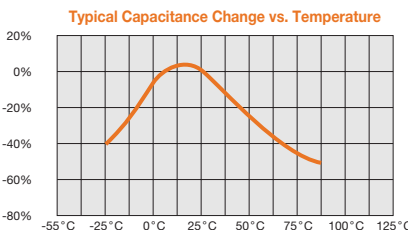
OPERATING TEMPERATURE RANGE:	-55°C to +125°C
TEMPERATURE COEFFICIENT:	0 ±15%Δ°C MAX.
TEMPERATURE VOLTAGE COEFFICIENT:	X7R not applicable
DISSIPATION FACTOR:	For 50 volts and 100 volts: 2.5% MAX.; For 25 volts: 3.0% MAX.; For 16 volts: 3.5% MAX.; For 10 volts: 5.0% MAX.; For 6.3 volts: 10% MAX. For values > 10μF and voltages ≤ 10V, the D.F. 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:



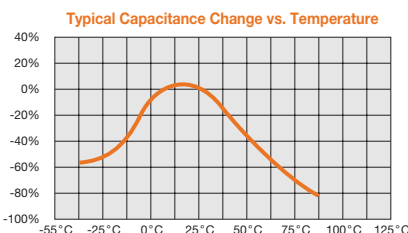
OPERATING TEMPERATURE RANGE:	-55°C to +85°C
TEMPERATURE COEFFICIENT:	0 ±15%Δ°C MAX.
TEMPERATURE VOLTAGE COEFFICIENT:	X5R not applicable
DISSIPATION FACTOR:	For 50 volts and 100 volts: 2.5% MAX.; For 25 volts: 3.0% MAX.; For 16 volts: 3.5% MAX.; For 10 volts: 5.0% MAX.; For 4.0 volts and 6.3 volts: 10% MAX. For values > 10μF and voltages ≤ 10V, 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

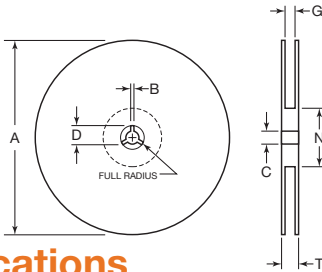
Y5V: SPECIFICATIONS:



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 Hi-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 61.

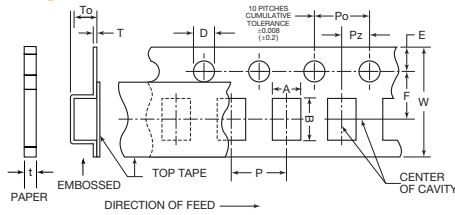


Reel Dimensions

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
C0G Temperature Characteristic
 See Chart

500 Rated Voltage
- 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
 201 = 200 VDCW
 251 = 250 VDCW

101 Capacitance (pico - Farads)
 1st two digits are significant, followed by number of zeroes.
 101 = 100 pF
 R denotes decimal
 6R8 = 6.8 pF

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. 10pF also available in 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"

- * Packaging Optional Identifier
 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 and 0402 size capacitors cannot be marked

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

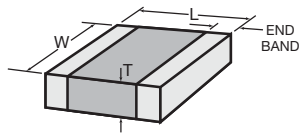
CODE:	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	6
DIMENSION:	.015	.020	.026	.030	.035	.040	.045	.050	.055	.060	.065	.070	.075	.080	.085	.090	.095	.100	.023

Please Note: Venkel offers Engineering Kits for this product. See page 120 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.

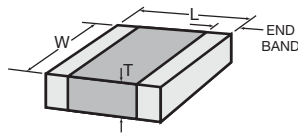
25V Available in 25V only.

(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	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																			
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.

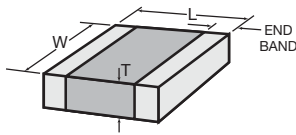
(All measurements in inches)		□		□		□		□		□		□		□		□		□	
Size	0201 (± 0.002)	0402 (± 0.004)	0504 (± 0.008)	0603 (± 0.006)	0805 (± 0.008)	1206 (± 0.008)	1210 (± 0.008)	1812 (± 0.012)	2220 / 2221 (± 0.016)										
L	.024	.040	.053	.063	.080	.126	.126	.177	.225 / .225										
W	.012	.020	.040	.032	.050	.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 14, 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	.016	.024					.040			.053			.063					.080		
W	.008	.012					.020			.040			.032					.050		
T (max)*	.008	.012					.025			.040			.035					.055		
Min E/B	.002	.002					.004			.005			.008					.020 ± .010		
VDCW (MAX)	6.3V	6.3V	10V	16V	25V	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																	

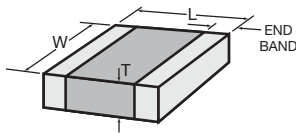
* For values above 1µF, thickness may be greater than specified above.
 T(max): 0603 – 0.048"
 0805 – 0.075"

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 14, 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					.035					.055						
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																		
124	.120																				
154	.150					X5R	X5R														
184	.180																				
224	.220	X5R				X5R	X5R														
274	.270																				
334	.330					X5R															
394	.390																				
474	.470					X5R	X5R														
564	.560																				
684	.680									X5R	X5R										
824	.820																				
105	1.00µF	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	X5R	X5R		
685	6.80																				
106	10.0µF					X5R					X5R							X5R			
156	15.0µF																				
226	22.0µF																				
476	47.0µF																				
107	100.0µF																				

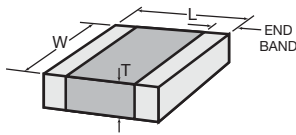
* For values above 1µF, thickness may be greater than specified above.
 T(max): 0603 – 0.048"
 0805 – 0.075"

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 14, 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																			
473	.047																				
563	.056																				
683	.068																				
823	.082																				
104	.10µF																				
124	.120																				
154	.150																				
184	.180																				
224	.220																				
274	.270																				
334	.330																				

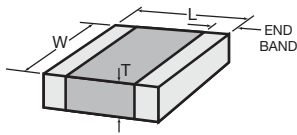
* For values above 1µF, thickness may be greater than specified above.
 T(max): 1206 - 0.110" 1812 - 0.130"
 1210 - 0.125" 2220 - 0.135"

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 14, 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)		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	1.00µF																					
	125	1.20																					
	155	1.50																					
	185	1.80																					
	225	2.20																					
	335	3.30																					
	475	4.70																					
	685	6.80																					
	106	10.0µF				X5R																	X5R
	156	15.0µF																				X5R	
226	22.0µF										X5R					X5R	X5R						
476	47.0µF							X5R						X5R	X5R								
107	100.0µF																						

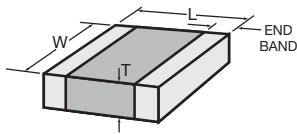
* For values above 1µF, thickness may be greater than specified above.
 T(max): 1206 - 0.110" 1812 - 0.130"
 1210 - 0.125" 2220 - 0.135"

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 10-13.

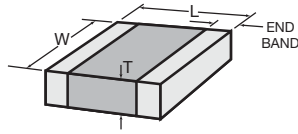
(All measurements in inches)		□			□				□				□				□				□				
Size	0201 (± 0.002)	0402 (± 0.004)			0603 (± 0.006)				0805 (± 0.008)				1206 (± 0.008)				1210 (± 0.008)				1812 (± 0.012)				
L	.024	.040			.063				.080				.126				.126				.177				
W	.012	.020			.032				.050				.063				.098				.126				
T (max)	.012	.025			.048				.075				.110				.125				.130				
Min E/B	.002	.004			.008				.020 \pm .010				.020 \pm .010				.020 \pm .010				.024 \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	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	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	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	6.3V 10V 16V 25V	6.3V 10V 16V 25V	6.3V 10V 16V 25V		
CAP. CODE 105 125 155 185 225 335	1.00 μ F	Available																							
	1.20	Available																							
	1.50	Available																							
	1.80	Available																							
	2.20	Available																							
	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 10–13.

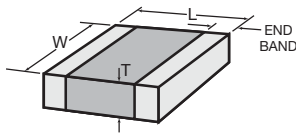
(All measurements in inches)		□		□		□				□				□				□				□							
Size	0402 (± 0.004)	0603 (± 0.006)		0805 (± 0.008)				1206 (± 0.008)				1210 (± 0.008)				1812 (± 0.012)				2220 / 2221 (± 0.016)									
L	.040	.063		.080				.126				.126				.177				.225 / .225									
W	.020	.032		.050				.063				.098				.126				.200 / .210									
T (max)	.025	.048		.075				.110				.125				.130				.135									
Min E/B	.004	.008		.020 ± .010				.020 ± .010				.020 ± .010				.024 ± .015				.025 ± .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	6.3V	10V	16V	25V	6.3V	10V	25V	50V			
CAP. CODE 395 475 685 106 156 226 476 107	CAP. VALUE 3.90 4.70 6.80 10.0 μ F 15.0 μ F 22.0 μ F 47.0 μ F 100.0 μ F	3.90																											
		4.70																											
		6.80																											
		10.0 μ F																											
		15.0 μ F																											
		22.0 μ F																											
		47.0 μ F																											
		100.0 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.

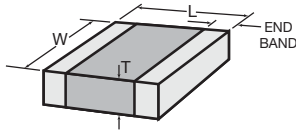
(All measurements in inches)		□		□		□		□		□		□		□			
Size		0504 (± 0.008)		0603 (± 0.006)		0805 (± 0.008)		1206 (± 0.008)		1210 (± 0.008)		1812 (± 0.012)		2220 / 2221 (± 0.016)			
L		.050		.063		.080		.126		.126		.177		.225 / .225			
W		.040		.032		.050		.063		.098		.126		.200 / .210			
T (max)*		.040		.033		.055		.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	Available													
	122		1200	Available													
	152		1500	Available													
	182		1800	Available													
	222		2200	Available													
	272		2700	Available													
	332		3300	Available													
	392		3900	Available													
	472		4700	Available													
	562		5600	Available													
682	6800	Available															
822	8200	Available															
CAP. CODE	103	CAP. VALUE	.01μF	Available													
	123		.012	Available													
	153		.015	Available													
	183		.018	Available													
	223		.022	Available													
	273		.027	Available													
	333		.033	Available													
	393		.039	Available													
	473		.047	Available													
	563		.056	Available													
683	.068	Available															
823	.082	Available															
CAP. CODE	104	CAP. VALUE	.100μF	Available													
	124		.120	Available													
	154		.150	Available													
	184		.180	Available													
	224		.220	Available													
	274		.270	Available													
334	.330	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.

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 (± 0.008)		1812 (± 0.012)		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		.033		.055		.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		
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														

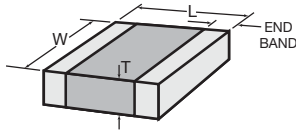
Note:

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.

Ceramic Chip Capacitors

Y5V Dielectric



Values that are typically available.

(All measurements in inches)

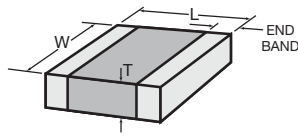
Size	0201 (± 0.002)	0402 (± 0.004)					0603 (± 0.006)					0805 (± 0.008)					1206 (± 0.008)					1210 (± 0.008)					1812 (± 0.012)				
L	.024	.040					.063					.080					.126					.126					.177				
W	.012	.020					.032					.050					.063					.098					.126				
T (max)*	.012	.025					.033					.055					.070					.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 (± 0.008)		1812 (± 0.012)														
L	.024	.040		.063		.080		.126		.126		.177														
W	.012	.020		.032		.050		.063		.098		.126														
T (max)*	.012	.025		.033		.055		.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.

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