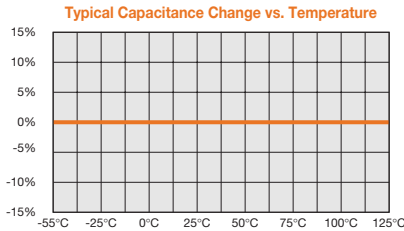


Ceramic Chip Capacitors

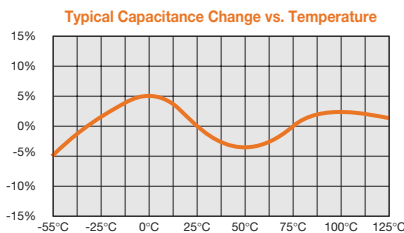
Multilayer chip capacitors have a low residual inductance, an excellent frequency response and minimal stray capacitance since there are no leads. These characteristics enable design to be very close to the theoretical values of the capacitors.

NP0/C0G: SPECIFICATIONS:



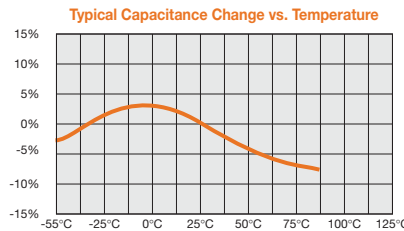
OPERATING TEMPERATURE RANGE:	-55°C to +125°C
TEMPERATURE COEFFICIENT:	0 ±30PPM/°C
TEMPERATURE VOLTAGE COEFFICIENT:	0 ±30PPM/°C
DISSIPATION FACTOR:	0.1% MAX.
INSULATION RESISTANCE:	>1000 ohms F or 100 G ohms, whichever is less at 25°C, VDCW. (The IR at 125°C is 10% of the value at 25°C)
AGEING:	None
WITHSTANDING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



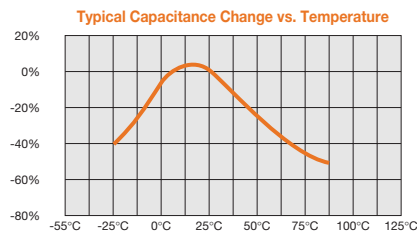
OPERATING TEMPERATURE RANGE:	-55°C to +125°C
TEMPERATURE COEFFICIENT:	0 ±15%Δ°C MAX.
TEMPERATURE VOLTAGE COEFFICIENT:	X7R not applicable
DISSIPATION FACTOR:	For 50 volts and 100 volts: 2.5% MAX.; For 25 volts: 3.0% MAX.; For 16 volts: 3.5% MAX.; For 10 volts: 5.0% MAX.; For 6.3 volts: 10% MAX. For values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



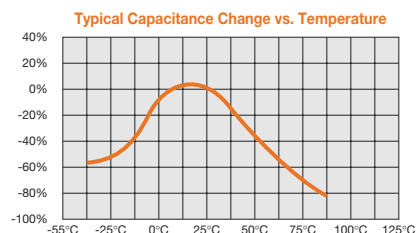
OPERATING TEMPERATURE RANGE:	-55°C to +85°C
TEMPERATURE COEFFICIENT:	0 ±15%Δ°C MAX.
TEMPERATURE VOLTAGE COEFFICIENT:	X5R not applicable
DISSIPATION FACTOR:	For 50 volts and 100 volts: 2.5% MAX.; For 25 volts: 3.0% MAX.; For 16 volts: 3.5% MAX.; For 10 volts: 5.0% MAX.; For 4.0 volts and 6.3 volts: 10%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

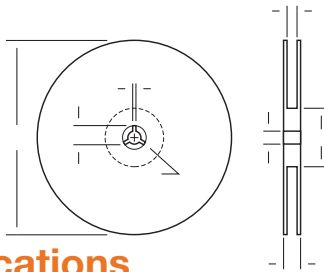
Y5V: SPECIFICATIONS:



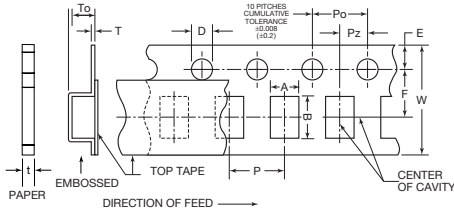
OPERATING TEMPERATURE RANGE:	-30°C to +85°C
TEMPERATURE COEFFICIENT:	+22% - 82%Δ°C MAX.
DISSIPATION FACTOR:	For 25 volts and 50 volts: 5% MAX.; For 16 volts: 7% MAX.; For 10 volts: 9% MAX.; For 6.3 volts: 11% MAX. For higher Cap values > 10μF, the D.F. is 20% MAX.
INSULATION RESISTANCE:	>100 ohms F or 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.



Taping Specifications



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)

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 (.010 ± .002)	0.45 ± 0.05 (.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)
0201	0.37 ± 0.05 (.014 ± .002)	0.67 ± 0.05 (.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)
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 (.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)
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 (.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)
1206	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)
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)

How To Order

C0805 Series
C0G 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.

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 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)

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

Optional Identifier
** 0201 and 0402 size capacitors cannot be marked

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

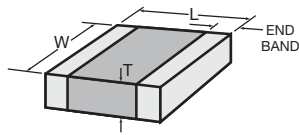
CODE:	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	6
DIMENSION:	.10	.15	.20	.26	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	.923

Please Note: Venkel offers Engineering Kits for this product. See page 117 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



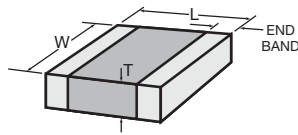
Values that are typically available.
 25V Available in 25V only.

(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																		
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		.020 ± .010		.024 ± .015		.025 ± .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																		

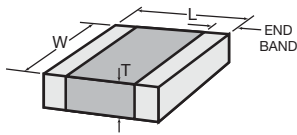
Note:

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

* For values above 1µF, thickness may be greater than specified above.

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			.033					.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																

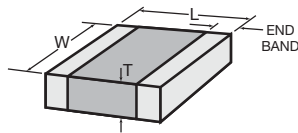
* For values above 1µF, thickness may be greater than specified above.
 T(max): 0603 – 0.048"
 0805 – 0.075"

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					.033					.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																				
184	.180																				
224	.220	X5R				X5R	X5R														
274	.270																				
334	.330					X5R															
394	.390																				
474	.470																				
564	.560																				
684	.680									X5R	X5R										
824	.820																				
105	1.00µF					X5R	X5R					X5R									
125	1.20																				
155	1.50																				
185	1.80																				
225	2.20					X5R	X5R			X5R	X5R	X5R									
335	3.30																X5R	X5R			
475	4.70									X5R	X5R						X5R				
685	6.80																				
106	10.0µF										X5R							X5R			
156	15.0µF																				
226	22.0µF																				
476	47.0µF																				
107	100.0µF																				

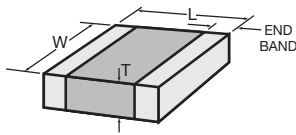
* For values above 1µF, thickness may be greater than specified above.
 T(max): 0603 – 0.048"
 0805 – 0.075"

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
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																				

* For values above 1µF, thickness may be greater than specified above.

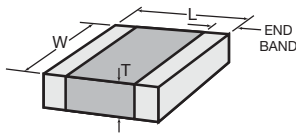
T(max): 1206 - 0.110" 1812 - 0.130"
1210 - 0.125" 2220 - 0.135"

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 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					.085					.108 / .108				
Min E/B		.020 \pm .010					.020 \pm .010					.024 \pm .015					.025 \pm .015				
VDCW (MAX)		10V	16V	25V	50V	100V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	16V	25V	50V	100V
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		X5R	X5R											X5R					X5R	
156	15.0 μ F																	X5R			
226	22.0 μ F						X5R	X5R	X5R					X5R	X5R						
476	47.0 μ F											X5R	X5R								
107	100.0 μ F																				

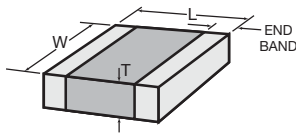
* For values above 1 μ F, thickness may be greater than specified above.
 T(max): 1206 - 0.110" 1812 - 0.130"
 1210 - 0.125" 2220 - 0.135"

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		0402 (\pm 0.004)			0603 (\pm 0.006)				0805 (\pm 0.008)				1206 (\pm 0.008)				1210 (\pm 0.008)				1812 (\pm 0.012)																	
L	.040			.063				.080				.126				.126				.177																		
W	.020			.032				.050				.063				.098				.126																		
T (max)*	.025			.033				.055				.070				.075				.085																		
Min E/B	.004			.008				.020 \pm .010				.020 \pm .010				.020 \pm .010				.024 \pm .015																		
VDCW (MAX)	4V		6.3V		10V		4V		6.3V		10V		16V		25V		6.3V		10V		16V		25V		6.3V		10V		16V		25V		6.3V		10V		16V	
CAP. CODE	105	CAP. VALUE	1.00 μ F	Available			Available				Available				Available				Available																			
	125		1.20	Available			Available				Available				Available				Available																			
	155		1.50	Available			Available				Available				Available				Available																			
	185		1.80	Available			Available				Available				Available				Available																			
	225		2.20	Available		Available		Available		Available		Available		Available		Available		Available		Available		Available		Available		Available		Available		Available		Available						
335	3.30	Available			Available				Available				Available				Available																					

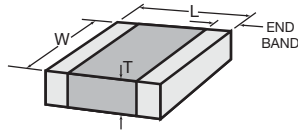
* For values above 1 μ F, thickness may be greater than specified above.
T(max): 0603 - 0.048" 1206 - 0.110" 1812 - 0.130"
0805 - 0.075" 1210 - 0.125" 2220 - 0.135"

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	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	.033		.055				.070				.075				.085				.108 / .108							
Min E/B	.004	.008		.020 ± .010				.020 ± .010				.020 ± .010				.024 ± .015				.025 ± .015							
VDCW (MAX)	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	CAP. VALUE	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																								

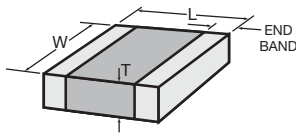
* For values above 1 μ F, thickness may be greater than specified above.
 T(max): 0603 – 0.048" 1206 – 0.110" 1812 – 0.130"
 0805 – 0.075" 1210 – 0.125" 2220 – 0.135"

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

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														
	103	.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															
104	.100μF	Available															
124	.120	Available															
154	.150	Available															
184	.180	Available															
224	.220	Available															
274	.270	Available															
334	.330	Available															

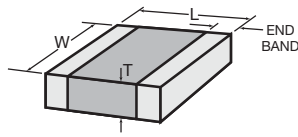
Note:

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

* For values above 1uF, thickness may be greater than specified above.

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														

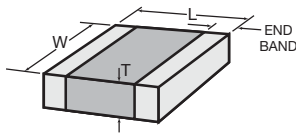
Note:

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																														
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104	.100μF																														
124	.120																														
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224	.220																														
274	.270																														
334	.330																														

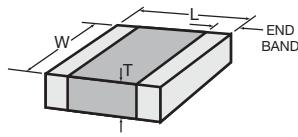
Note:

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

* For values above 1uF, 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	16V	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.