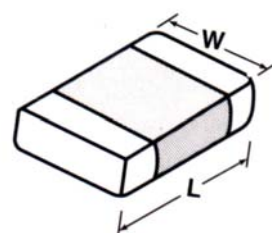


Part Number Code

	<u>0805</u>	<u>N</u>	<u>102</u>	<u>J</u>	<u>500</u>	<u>N</u>	<u>T</u>
SIZE CODE	↑						
0402 = .04 X .02" 0603 = .06 X .03"							
0805 = .08 X .05" 1206 = .12 X .06"							
1210 = .12 X .10" 1808 = .18 X .08"							
1812 = .18 X .12" 2220 = .22 X .20"							
DIELECTRIC	↑						
N (COG) B (X7R)							
Y (Y5V) X (X5R)							
CAPACITANCE	↑						
Value in Pico farads: Two significant figures							
Followed by number of zero. 0R5=0.5pF 2R0=2pF 101=100pF.							
CAPACITANCE TOLERANCE	↑						
A = ±0.05pF B = ±0.10pF (EIA Code)							
C = ±0.25pF D = ±0.50pF							
F = ±1.0% G = ±2.0%							
H = ±3.0% J = ±5.0%							
K = ±10% M = ±20%							
Z = -20% ~+80% Tolerances may be restricted by dielectric type.							
VOLTAGE	↑						
VDC : Two significant figures followed by number of zeros							
063 = 6.3 VDC 100 = 10 VDC 160 = 16 VDC 250 = 25 VDC							
500 = 50 VDC 101 = 100 VDC 251 = 250 VDC 501 = 500VDC							
102 = 1 KVDC 202 = 2 KVDC 302 = 3 KVDC							
TERMINATION	↑						
N = Nickel barrier with 100% Tin							
PACKING CODE	↑						
B = Bulk in bag							
05 = 500/Reel 1= 1K/Reel 2= 2K/Reel 3= 3K/Reel (for plastic tape only)							
T = 4K/Reel U= 10K/ Reel V= 15K/ Reel W = 50K/Reel							



Dimension : (UNIT mm)

	0402	0603	0805	1206	1210	1808	1812	1825	2220	2211	2225
L	1.00±0.05	1.60±0.10	2.00±0.20	3.20±0.20	3.20±0.30	4.50±0.30	4.50±0.30	4.50±0.30	5.70±0.40	5.70±0.40	5.70±0.40
W	0.50±0.05	0.80±0.10	1.25±0.20	1.60±0.20	2.50±0.20	2.00±0.20	3.20±0.30	6.30±0.40	5.00±0.40	2.80±0.40	6.30±0.40

Storage

1. Storage condition :To be sure the ambient temperature is 40 Celsius maximum and humidity is 80% Relative Humidity Maximum.
2. Storage environment: Do not store where the soldering quality can be destroyed by harmful gas such as sulfurous gas, chlorine gas, etc.
3. Store period: Should be used within 6 months after unpacking from the original reel or bulk products. Otherwise, check the solder ability before applied.

CERAMIC CHIP CAPACTIORS X7R/X5R DIELECTRIC

APPLICATION

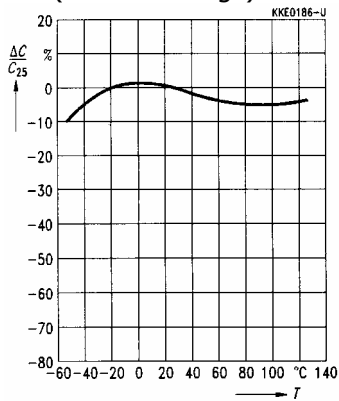
X7R/X5R dielectric properties: suited for by-pass and coupling purposes, filtering, frequency discrimination, DC blockage, and as voltage transient suppression elements.

General Specification

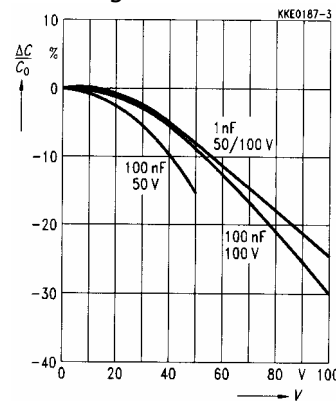
- **Operating temperature range** : X7R: $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$, X5R: $-55^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- **Temperature coefficient**: ΔC : $\pm 15\%$ maximum
- **Capacitance Range**: 100pF \sim 100uF
- **Capacitance Tolerance**: $\pm 10\%$, $\pm 20\%$, $\pm 5\%$ (Test condition : $C \leq 10\mu\text{F}$, $1 \pm 0.2\text{Vrms}$, 1KHz, $C > 10\mu\text{F}$, $0.5\text{V} \pm 0.2\text{Vrms}$, 120Hz)
- **Voltage Ratings**: 6.3V, 10V, 16V, 25V, 50V, 100V, 250V, 500V, 1000V, 2000V&3000VDC
- **Dissipation Factor**: 2.5% Max ($\geq 50\text{V}$), 3.5% Max (25V,16V), 5% Max(10V) (Test condition: same as capacitance)
- **Insulation resistance**: 10,000 M Ω or 100 Ω -F min, whichever is less. (rated voltage applied at 25°C)
- **Dielectric strength**: $> 250\%$ of rated voltage for 10 \sim 100V, 200% for 200&250V, 150% for 500V, 120% for $\geq 1000\text{V}$

Characteristics

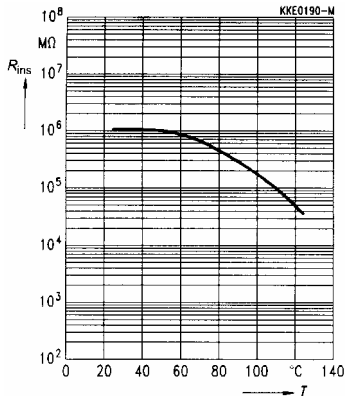
Capacitance change $\Delta C/C_{25}$ versus temperature T (tolerance range)



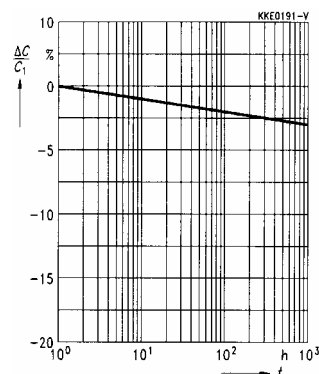
Capacitance change $\Delta C/C_0$ versus superimposed dc voltage V



Insulation resistance R_{ins} versus Temperature T



Capacitance change $\Delta C/C_1$ versus time (aging rate)



CERAMIC CHIP CAPACTIORS X7R/X5R DIELECTRIC

SIZE AND VALUES AVAILABLE (X7R) 10V – 50V

Size		0402				0603				0805				1206				1210			1812		2220	
(L)	mm	1.00±0.05				1.60±0.10				2.00±0.20				3.20±0.20				3.20±0.30			4.50±0.30		5.70±0.40	
(W)	mm	0.50±0.05				0.80±0.10				1.25±0.20				1.60±0.20				2.50±0.20			3.20±0.20		5.00±0.40	
(T)	mm	0.50±0.05				0.80±0.12				1.25±0.20				1.65±0.20				2.50±0.20			3.00±0.20		3.00±0.20	
(t)	mm	0.15~0.35				0.27~0.60				0.30~0.70				0.30~0.70				0.30~0.70			0.35~1.00		0.35~1.00	
Cap.\\ W.V.		10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	16	25	50	25	50	25	50
100	pF				S				P				H											
120	pF				S				P				H											
150	pF				S				P				H											
180	pF				S				P				H											
220	pF				S				P				H					H						
270	pF				S				P				H					H						
330	pF				S				P				H					H						
390	pF				S				P				H					H						
470	pF				S				P				H					H						
560	pF				S				P				H					H						
680	pF				S				P				H					H						
820	pF				S				P				H					H						
1000	pF				S				P				H					H						
1200	pF				S				P				H					H						
1500	pF				S				P				H					H						
1800	pF				S				P				H					H						
2200	pF				S				P				H					H						
2700	pF				S				P				H					H						
3300	pF				S				P				H					H						
3900	pF				S				P				H					H						
4700	pF				S				P				H					H						
5600	pF				S				P				H					H						
6800	pF				S				P				H					H						
8200	pF				S				P				H					H						
10	nF			S	S				P				H					H						
12	nF			S					P				H					H						
15	nF			S					P				H					H						
18	nF			S					P				H					H						
22	nF			S	S				P				H					H						
27	nF			S					P				H					H						
33	nF			S					P				H					H						
39	nF			S					P				H					H						
47	nF		S	S	S				P	P			H					H						
56	nF		S						P	P			H					H						
68	nF		S						P	P			H					H						
82	nF		S						P	P			H					H						
100	nF	S	S	S	S			P	P	P			H					H					X	
150	nF					P	P	P	P		X	X	X					X					X	
220	nF	S	S			P	P	P	P		X	X	X					X					X	
330	nF					P	P	P	P		X	X	X			X	X						X	
470	nF					P	P	P	P		X	X	X			X	X						X	
680	nF					P	P				X	X			X	X		L					L/Z	
1.0	uF					P	P	P		X	X	X	X		X	X		L			L		L/Z	Z
2.2	uF					P				X	X	X			L	L		L			Z		Z	Z
3.3	uF																				G		G	Z
4.7	uF									X	X	X	X		L	L		L		Z	G	Z	G	Z
10	uF									X				L	L			Z	Z/G	G	Z/G		Z	G
22	uF																	G			Z/G		G	

CERAMIC CHIP CAPACTIORS X7R/X5R DIELECTRIC

SIZE AND VALUES AVAILABLE (X7R) 100V – 630V (Medium Voltage)

Size		0603			0805				1206					1210					1812				
(L)	mm	1.60±0.10			2.00±0.20				3.20±0.20					3.20±0.30					4.50±0.30				
(W)	mm	0.80±0.10			1.25±0.20				1.60±0.20					2.50±0.20					3.20±0.20				
(T)	mm	0.80±0.12			1.25±0.20				1.65±0.20					2.50±0.20					2.50±0.20				
(t)	mm	0.27~0.60			0.30~0.70				0.30~0.70					0.30~0.70					0.35~1.00				
Cap.\\ W.V.		100	200	250	100	200	250	500	100	200	250	500	630	100	200	250	500	630	100	200	250	500	630
100	µF	P	P	P	H	H	H	H	H	H	H												
150	µF	P	P	P	H	H	H	H	H	H	H												
220	µF	P	P	P	H	H	H	H	H	H	H	X	X										
330	µF	P	P	P	H	H	H	H	H	H	H	X	X										
470	µF	P	P	P	H	H	H	H	H	H	H	X	X						L	L	L	L	L
680	µF	P	P	P	H	H	H	H	H	H	H	X	X						L	L	L	L	L
1000	µF	P	P	P	H	H	H	H	H	H	H	X	X						L	L	L	L	L
1500	µF	P	P	P	H	H	H	H	H	H	H	X	X						L	L	L	L	L
2200	µF	P	P	P	H	H	H	H	H	H	H	X	X						L	L	L	L	L
3300	µF	P	P	P	H	H	H	H	H	H	H	X	X						L	L	L	L	L
4700	µF	P	P	P	H	H	H	X	H	H	H	X	X						L	L	L	L	L
6800	µF	P	P	P	H	H	H	X	H	H	H	X	X						L	L	L	L	L
10	nF	P	P	P	H	H	H	X	H	H	H	X	X		L	L	L	L	L	L	L	L	L
15	nF	P	P	P	H	H	H	X	H	X	X	L	L		L	L	L	L	L	L	L	L	L
22	nF	P			H	H	H	X	H	X	X	L	L		L	L	L	L	L	L	L	L	L
33	nF	P			X	X	X		X	X	X	L	L		L	L	L	L	L	L	L	L	L
47	nF				X	X	X		X	X	X				L	L	L	L	L	L	L	L	L
68	nF				X				X	L	L				L	L	L	L	L	L	L	Z	Z
100	nF				X				X	L	L			L	L	L	L	L	L	L	L	Z	Z
150	nF				X				L					L	L	L			L	L	L	Z	Z
220	nF				X				L					L	L	L			L	L	L	Z	
330	nF								L					L	G	G			L	L	Z		
470	nF								L					L	G	G			L	L	Z		
680	nF								L					L					L	G	G		
1.0	µF								L					Z					L	G	G		
1.5	µF													G					L				
2.2	µF													G					G				

CERAMIC CHIP CAPACTIORS X7R/X5R DIELECTRIC

SIZE AND VALUES AVAILABLE (X7R) 100V – 630V (Medium Voltage)

Size		1825					2220					2225				
(L)	mm	4.50±0.30					5.70±0.40					5.70±0.40				
(W)	mm	6.30±0.40					5.00±0.40					6.30±0.40				
(T)	mm	2.50±0.30					3.00±0.20					3.00±0.20				
(t)	mm	0.35~1.00					0.35~1.00					0.35~1.00				
Cap. \\ W.V		100	200	250	500	630	100	200	250	500	630	100	200	250	500	630
470	pF															
680	pF															
1000	pF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
1500	pF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
2200	pF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
3300	pF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
4700	pF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
6800	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
10	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
15	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
22	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
33	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
47	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
68	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
100	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
150	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
220	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
330	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
470	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	G	G
680	nF	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	G	G
1.0	uF	Z	Z	Z			Z	Z	Z			Z	Z	Z	G	G
2.2	uF	Z	G	G			Z	G	G			Z	G	G		
3.3	uF	Z					Z					Z				
4.7	uF	G					G					G				
6.8	uF						U					G				
10	uF						U					G				

Remark: Customized size and specification is available upon request. Please contact us for further details

CERAMIC CHIP CAPACTIORS X7R/X5R DIELECTRIC

SIZE AND VALUES AVAILABLE (X5R) 6.3V – 50V *Available in 20% tolerance only.

Size		0402					0603					0805					1206							
(L)	mm	1.00±0.05					1.60±0.10					2.00±0.20					3.20±0.20							
(W)	mm	0.50±0.05					0.80±0.10					1.25±0.20					1.60±0.20							
(T)	mm	0.50±0.05					0.80±0.12					1.25±0.20					1.65±0.20							
(t)	mm	0.15~0.35					0.27~0.60					0.30~0.70					0.30~0.70							
Cap./ W.V.		6.3	10	16	25	50	4	6.3	10	16	25	50	4	6.3	10	16	25	50	6.3	10	16	25	50	
100	nF			S	S	S																		
220	nF	S	S	S	S						P													
330	nF	S									P													
470	nF	S	S	S	S					P	P	P												
680	nF	S							P	P	P													
1.0	uF	S	S	S	S				P	P	P	P												L
2.2	uF	S	S	S	S			P	P	P	P			X	X	X	X	X						L
3.3	uF	S																				L	L	
4.7	uF	S	S					P	P	P	P			X	X	X	X	X				L	L	L
10	uF	*S						*P	*P	*P	*P			X	X	X	X			L	L	L	L	
22	uF						*P	*P	*P					*X	*X	*X	*X		*L	*L	*L	*L		
47	uF												*X	*X	*X				*L	*L	*L	*L		
100	uF																		*L	*L				

Size		1210					1812				2220			
(L)	mm	3.20±0.30					4.50±0.30				5.70±0.40			
(W)	mm	2.50±0.20					3.20±0.20				5.00±0.40			
(T)	mm	2.50±0.20					3.00±0.20				3.00±0.20			
(t)	mm	0.30~0.70					0.35~1.00				0.35~1.00			
Cap./ W.V		6.3	10	16	25	50	6.3	10	16	25	10	16	25	50
1.0	uF													
2.2	uF					G								
3.3	uF													
4.7	uF					G								
10	uF			Z	G	G				G				G
22	uF		Z/G	G					*G	*G				*G
47	uF	*G	*G				*G	*U						*G
100	uF	*G					*U	*U					*G	

CERAMIC CHIP CAPACTIORS X7R/X5R DIELECTRIC

Thickness Code & Standard Packing Q'ty per reel

Thickness Code	Chip Size	Chip Thickness	Max Tape Thickness	Q'ty of carboard tape in		Q'ty of Embosses tape in	
				7" reel	13" reel	7" reel	13" reel
S	0402	0.50±0.05 mm	0.60 mm	10,000	50,000	--	--
P	0603	0.80±0.10 mm	0.95 mm	4,000	15,000	--	--
A	0805	0.60±0.10 mm	0.75 mm	4,000	15,000	--	--
H		0.85±0.10 mm	0.95 mm	4,000	15,000	--	--
X		1.25±0.10 mm	1.80 mm	--	--	3,000	10,000
H	1206	0.85±0.10 mm	0.90 mm	4,000	15,000	--	--
C		0.95±0.10 mm	1.80 mm			3,000	10,000
X		1.25±0.10 mm	1.80 mm	--	--	3,000	10,000
L		1.65±0.20 mm	1.80 mm	--	--	2,000	--
C	1210	0.95±0.10 mm	1.80 mm			3,000	10,000
X		1.25±0.10 mm	1.80 mm	--	--	2,000	--
L		1.65±0.20 mm	1.80 mm	--	--	2,000	--
Z		2.00±0.20 mm	2.20 mm	--	--	2,000	--
G		2.50±0.20 mm	2.75 mm	--	--	1,000	--
X	1808	1.25±0.10 mm	1.80 mm	--	--	2,000	--
F		1.40±0.20 mm	1.80 mm	--	--	2,000	--
L		1.65±0.20 mm	1.80 mm	--	--	2,000	--
Z		2.00±0.20 mm	2.20 mm	--	--	1,000	--
X	1812	1.25±0.20 mm	1.80 mm	--	--	1,000	--
L		1.65±0.20 mm	1.80 mm			1,000	
Z		2.00±0.20 mm	2.20 mm	--	--	1,000	--
G		2.50±0.20 mm	2.75 mm	--	--	500	--
U		2.80±0.30 mm	3.00 mm	--	--	500	--
Z	1825	2.00±0.20 mm	2.20 mm	--	--	1,000	--
G		2.50±0.20 mm	2.75 mm	--	--	500	--
Z	2220	2.00±0.20 mm	2.20 mm	--	--	500	--
G		2.50±0.20 mm	2.75 mm	--	--	500	--
U		2.80±0.30 mm	3.00 mm	--	--	500	--
L	2211	1.65±0.20 mm	1.80 mm			1,000	
Z		2.00±0.20 mm	2.20 mm	--	--	1,000	--
G		2.50±0.20 mm	2.75 mm	--	--	500	--
Z	2225	2.00±0.20 mm	2.20 mm	--	--	1,000	--
G		2.50±0.20 mm	2.75 mm	--	--	500	--