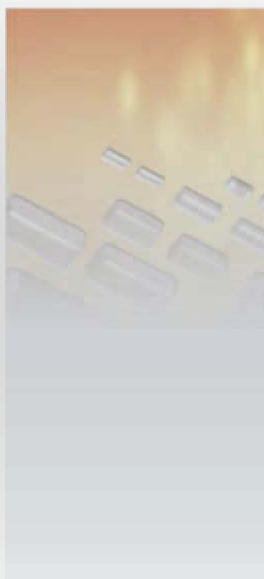


MULTILAYER CERAMIC CHIP CAPACITORS

C Series Commercial Grade Soft Termination

Type:

**C1005 [EIA CC0402]
C1608 [EIA CC0603]
C2012 [EIA CC0805]
C3216 [EIA CC1206]
C3225 [EIA CC1210]
C4520 [EIA CC1808]
C4532 [EIA CC1812]
C5750 [EIA CC2220]
C7563 [EIA CC3025]**



REMINDERS

Please read before using this product

SAFETY REMINDERS



REMINDERS

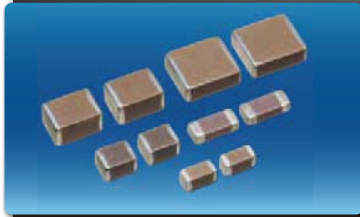
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Notice: Effective January 2013, TDK will use a new catalog number which adds product thickness and packaging specification detail. This new catalog number should be referenced on all catalog orders going forward, and is not applicable for OEM part number orders. Please be aware the last five digits of the catalog number will differ from the item description (internal control number) on the product label. Contact your local TDK Sales representative for more information.

(Example)

Catalog Issued date	Catalog Number	Item Description (On Delivery Label)
Prior to January 2013	C1608C0G1E103J(080AA)	C1608C0G1E103JT000N
January 2013 and Later	C1608C0G1E103J080AA	C1608C0G1E103JT000N

MULTILAYER CERAMIC CHIP CAPACITORS



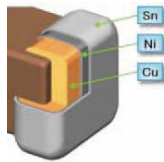
C Series Soft Termination

Type: C1005 [EIA CC0402], C1608 [EIA CC0603], C2012 [EIA CC0805], C3216 [EIA CC1206], C3225 [EIA CC1210], C4520 [EIA CC1808], C4532 [EIA CC1812], C5750 [EIA CC2220], C7563 [EIA CC3025]

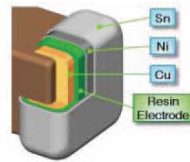
Features

- Improved board bending resistance, drop impact resistance, thermal shock resistance, and heat cycle properties.
- Conductive resin absorb external stress to protect solder joint parts and capacitor body.
- Compliance with the RoHS Directive.

Standard Product



Soft Termination



Applications

- Switching power supply
- Telecom base station
- Electronic circuits mounted on alumina substrate
- SMT application which requires bending robustness in which solder joint reliability is problematic

Shape & Dimensions



L	Body Length
W	Body Width
T	Body Height
B	Terminal Width
G	Terminal Spacing

Catalog Number Construction

Series Name

Dimensions L x W (mm)

Code	Length	Width	Terminal
C1005	1.00 ± 0.15/-0.05	0.50 ± 0.10/-0.05	0.10 min.
C1608	1.60 ± 0.20/-0.10	0.80 ± 0.15/-0.10	0.20 min.
C2012	2.00 ± 0.45/-0.20	1.25 ± 0.25/-0.20	0.20 min.
C3216	3.20 ± 0.40/-0.20	1.60 ± 0.30/-0.20	0.20 min.
C3225	3.20 ± 0.50/-0.40	2.50 ± 0.30	0.20 min.
C4520	4.50 ± 0.30/-0.20	2.00 ± 0.15	0.20 min.
C4532	4.50 ± 0.50/-0.40	3.20 ± 0.40	0.20 min.
C5750	5.70 ± 0.50/-0.40	5.00 ± 0.40	0.20 min.
C7563	7.50 ± 0.50	6.30 ± 0.50	0.30 min.

*Dimension tolerance are typical values

Temperature Characteristics

Temperature Characteristics	Temperature Coefficient or Capacitance Change	Temperature Range
C0G	0 ±30ppm/°C	-55 to +125°C
X7R	±15%	-55 to +125°C
X7S	±22%	-55 to +125°C
X7T	+22/-33%	-55 to +125°C
X8R	±15%	-55 to +150°C

Rated Voltage (DC)

Code	Voltage (DC)
1A	10V
1C	16V
1E	25V
1V	35V
1H	50V
2A	100V
2E	250V
2W	450V
2J	630V
3A	1000V
3D	2000V
3F	3000V

Nominal Capacitance (pF)

The capacitance is expressed in three digit codes and in units of pico Farads (pF). The first and second digits identify the first and second significant figures of the capacitance. The third digit identifies the multiplier. R designates a decimal point. Ex. 0R2 = 0.2pF; 103 = 10,000pF; 105 = 1,000,000pF = 1,000nF

Capacitance Tolerance

Code	Tolerance
J	± 5%
K	± 10%
M	± 20%

Nominal Thickness

Code	Thickness
050	0.50 mm
080	0.80 mm
085	0.85 mm
115	1.15 mm
125	1.25 mm
130	1.30 mm
160	1.60 mm
200	2.00 mm
230	2.30 mm
250	2.50 mm
280	2.80 mm

Packaging Style

Code	Style
A	178mm Reel, 4mm Pitch
B	178mm Reel, 2mm Pitch
K	178mm Reel, 8mm Pitch
L	330mm Reel, 12mm Pitch

Special Reserved Code

Code	Description
E	Soft Termination

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Chart

EIA CC0402[C1005]

Capacitance Range Chart

Temperature Characteristics : C0G(0±30ppm/°C) , X7R(±15%) , X8R(±15%)

Rated Voltage : 100V(2A) , 50V(1H) , 35V(1V) , 25V(1E) , 16V(1C)

Capacitance		Tolerance	C0G	X7R				X8R			
(pF)	Code		1H (50V)	1H (50V)	1V (35V)	1E (25V)	1C (16V)	2A (100V)	1H (50V)	1E (25V)	1C (16V)
100	101	J:±5%									
150	151	K:±10%									
220	221	M:±20%									
330	331										
470	471										
680	681										
1,000	102										
1,500	152										
2,200	222										
3,300	332										
4,700	472										
6,800	682										
10,000	103										
15,000	153										
22,000	223										
33,000	333										
47,000	473										
100,000	104										
220,000	224										

Standard Thickness

0.50 mm

Capacitance Range Chart

EIA CC0603 [C1608]

Capacitance Range Chart

Temperature Characteristics : C0G(0±30ppm/°C) , X7R(±15%) , X7S(±22%) , X8R(±15%)

Rated Voltage : 100V(2A) , 50V(1H) , 35V(1V) , 25V(1E) , 16V(1C) , 10V(1A)

Capacitance		Tolerance	C0G	X7R					X7S	X8R			
(pF)	Code		1H (50V)	2A (100V)	1H (50V)	1V (35V)	1E (25V)	1A (10V)	2A (100V)	2A (100V)	1H (50V)	1E (25V)	1C (16V)
100	101	J:±5%											
1,000	102	K:±10%											
1,500	152	M:±20%											
2,200	222												
3,300	332												
4,700	472												
6,800	682												
10,000	103												
15,000	153												
22,000	223												
33,000	333												
47,000	473												
68,000	683												
100,000	104												
150,000	154												
220,000	224												
330,000	334												
470,000	474												
1,000,000	105												
2,200,000	225												

Standard Thickness

0.80 mm

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Chart

EIA CC0805 [C2012]

Capacitance Range Chart

Temperature Characteristics : X7R($\pm 15\%$), X7S($\pm 22\%$), X7T($+22/-33\%$)

Rated Voltage : 450V(2W), 250V(2E), 100V(2A), 50V(1H), 35V(1V), 25V(1E), 16V(1C), 10V(1A)

Capacitance		Tolerance	X7R							X7S	X7T	
(pF)	Code		2E (250V)	2A (100V)	1H (50V)	1V (35V)	1E (25V)	1C (16V)	1A (10V)	2A (100V)	2W (450V)	2E (250V)
1,000	102	K: $\pm 10\%$ M: $\pm 20\%$										
2,200	222											
4,700	472											
10,000	103											
22,000	223											
47,000	473											
100,000	104											
220,000	224											
470,000	474											
1,000,000	105											
2,200,000	225											
4,700,000	475											
10,000,000	106											

Standard Thickness

0.85 mm
1.25 mm

Capacitance Range Chart

Temperature Characteristics : X8R($\pm 15\%$)

Rated Voltage : 100V(2A), 50V(1H), 25V(1E), 16V(1C)

Capacitance		Tolerance	X8R			
(pF)	Code		2A (100V)	1H (50V)	1E (25V)	1C (16V)
22,000	223	K: $\pm 10\%$ M: $\pm 20\%$				
33,000	333					
47,000	473					
68,000	683					
100,000	104					
150,000	154					
220,000	224					
330,000	334					
470,000	474					
680,000	684					
1,000,000	105					

Standard Thickness

0.85 mm
1.25 mm

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Chart

EIA CC1206 [C3216]

Capacitance Range Chart

Temperature Characteristics : X7R($\pm 15\%$), X7S($\pm 22\%$)

Rated Voltage : 630V(2J), 250V(2E), 100V(2A), 50V(1H), 35V(1V), 25V(1E), 16V(1C)

Capacitance		Tolerance	X7R								X7S
(pF)	Code		2J (630V)	2E (250V)	2A (100V)	1H (50V)	1V (35V)	1E (25V)	1C (16V)	2A (100V)	
1,000	102	K: $\pm 10\%$ M: $\pm 20\%$									
2,200	222										
3,300	332										
4,700	472										
10,000	103										
22,000	223										
33,000	333										
47,000	473										
100,000	104										
220,000	224										
470,000	474										
1,000,000	105										
2,200,000	225										
4,700,000	475										
10,000,000	106										

Standard Thickness

1.15 mm
1.30 mm
1.60 mm

Capacitance Range Chart

Temperature Characteristics : X7T($+22/-33\%$), X8R($\pm 15\%$)

Rated Voltage : 630V(2J), 450V(2W), 250V(2E), 100V(2A), 50V(1H), 25V(1E), 16V(1C)

Capacitance		Tolerance	X7T			X8R			
(pF)	Code		2J (630V)	2W (450V)	2E (250V)	2A (100V)	1H (50V)	1E (25V)	1C (16V)
47,000	473	K: $\pm 10\%$ M: $\pm 20\%$							
100,000	104								
150,000	154								
220,000	224								
330,000	334								
470,000	474								
680,000	684								
1,000,000	105								
1,500,000	155								
2,200,000	225								
3,300,000	335								
4,700,000	475								

Standard Thickness

1.15 mm
1.60 mm

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Chart

EIA CC1210 [C3225]

Capacitance Range Chart

Temperature Characteristics : X7R(±15%), X7S(±22%), X7T(+22/-33%), X8R(±15%)

Rated Voltage : 630V(2J), 450V(2W), 250V(2E), 100V(2A), 50V(1H), 25V(1E)

Capacitance		Tolerance	X7R				X7S		X7T			X8R	
(pF)	Code		2J (630V)	2E (250V)	2A (100V)	1H (50V)	2A (100V)	1H (50V)	2J (630V)	2W (450V)	2E (250V)	2A (100V)	1E (25V)
47,000	473	K: ± 10%											
68,000	683	M: ± 20%											
100,000	104												
150,000	154												
220,000	224												
330,000	334												
470,000	474												
680,000	684												
1,000,000	105												
2,200,000	225												
3,300,000	335												
4,700,000	475												
10,000,000	106												

Standard Thickness 1.60 mm 2.00 mm 2.30 mm 2.50 mm

Capacitance Range Chart

EIA CC1808 [C4520]

Capacitance Range Chart

Temperature Characteristics : X7R (±15%)

Rated Voltage : 2000V (3D)

Capacitance		Tolerance	X7R
(pF)	Code		3D (2000V)
1,000	102	K: ± 10% M: ± 20%	

Standard Thickness

1.30 mm

Capacitance Range Chart

EIA CC1812 [C4532]

Capacitance Range Chart

Temperature Characteristics : C0G(0±30ppm/°C), X7R (±15%), X7T (+22/-33%)

Rated Voltage : 3000V(3F), 2000V(3D), 630V(2J), 450V(2W), 250V(2E)

Capacitance		Tolerance	C0G	X7R			X7T		
(pF)	Code		3F (3000V)	3D (2000V)	2J (630V)	2E (250V)	2J (630V)	2W (450V)	2E (250V)
330	331	K: ± 10%							
2,200	222	K: ± 10%							
100,000	104	M: ± 20%							
220,000	224								
470,000	474								
1,000,000	105								

Standard Thickness

1.30 mm

2.00 mm

2.30 mm

2.50 mm

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Chart

EIA CC2220 [C5750]

Capacitance Range Chart

Temperature Characteristics : X7R ($\pm 15\%$), X7S ($\pm 22\%$), X7T ($+22/-33\%$)

Rated Voltage : 630V (2J), 450V (2W), 250V (2E), 100V (2A)

Capacitance		Tolerance	X7R		X7S	X7T		
(pF)	Code		2J (630V)	2E (250V)	2A (100V)	2J (630V)	2W (450V)	2E (250V)
220,000	224	K: $\pm 10\%$ M: $\pm 20\%$						
470,000	474							
1,000,000	105							
2,200,000	225							
10,000,000	106							

Standard Thickness

 2.30 mm

 2.50 mm

Capacitance Range Chart

EIA CC3025 [C7563]

Capacitance Range Chart

Temperature Characteristics : X7S ($\pm 22\%$)

Rated Voltage : 50V (1H), 16V (1C)

Capacitance		Tolerance	X7S	
(pF)	Code		1H (50V)	1C (16V)
22,000,000	226	M: $\pm 20\%$		
100,000,000	107			

Standard Thickness

 2.30 mm

 2.80 mm

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Table

Class 1 (Temperature Compensating)

Temperature Characteristics: C0G (-55 to +125°C, 0 ± 30 ppm/°C)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number	
				Rated Voltage Edc : 3000V	Rated Voltage Edc : 50V
100pF	1005	0.50+0.10/-0.05	±5%		C1005C0G1H101J050BE
	1608	0.80+0.15/-0.10	±5%		C1608C0G1H101J080AE
330pF	4532	2.50 ± 0.20	± 10%	C4532C0G3F331K250KE	

Class 2 (Temperature Stable)

Temperature Characteristics: X7R (-55 to +125°C, ±15%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number				
				Rated Voltage Edc : 2000V	Rated Voltage Edc : 630V	Rated Voltage Edc : 250V	Rated Voltage Edc : 100V	Rated Voltage Edc : 50V
1nF	1005	0.50+0.10/-0.05	±10%					C1005X7R1H102K050BE
			±20%					C1005X7R1H102M050BE
	1608	0.80 +0.15/-0.10	±10%				C1608X7R2A102K080AE	C1608X7R1H102K080AE
			±20%				C1608X7R2A102M080AE	C1608X7R1H102M080AE
	2012	0.85±0.15	±10%			C2012X7R2E102K085AE	C2012X7R2A102K085AE	
			±20%			C2012X7R2E102M085AE	C2012X7R2A102M085AE	
	3216	1.15±0.15	±10%		C3216X7R2J102K115AE			
			±20%		C3216X7R2J102M115AE			
	4520	1.30±0.15	±10%	C4520X7R3D102K130KE				
			±20%	C4520X7R3D102M130KE				
2.2nF	1005	0.50+0.10/-0.05	±10%					C1005X7R1H222K050BE
			±20%					C1005X7R1H222M050BE
	1608	0.80+0.15/-0.10	±10%				C1608X7R2A222K080AE	C1608X7R1H222K080AE
			±20%				C1608X7R2A222M080AE	C1608X7R1H222M080AE
	2012	0.85±0.15	±10%			C2012X7R2E222K085AE	C2012X7R2A222K085AE	
			±20%			C2012X7R2E222M085AE	C2012X7R2A222M085AE	
	3216	1.15±0.15	±10%		C3216X7R2J222K115AE			
			±20%		C3216X7R2J222M115AE			
	4532	1.30±0.15	±10%	C4532X7R3D222K130KE				
			±20%	C4532X7R3D222M130KE				
3.3nF	3216	1.15±0.15	±10%		C3216X7R2J332K115AE			
			±20%		C3216X7R2J332M115AE			
4.7nF	1005	0.50+0.10/-0.05	±10%					C1005X7R1H472K050BE
			±20%					C1005X7R1H472M050BE
	1608	0.80+0.15/-0.10	±10%				C1608X7R2A472K080AE	C1608X7R1H472K080AE
			±20%				C1608X7R2A472M080AE	C1608X7R1H472M080AE
	2012	0.85±0.15	±10%			C2012X7R2E472K085AE	C2012X7R2A472K085AE	
			±20%			C2012X7R2E472M085AE	C2012X7R2A472M085AE	
	3216	1.15±0.15	±10%		C3216X7R2J472K115AE			
			±20%		C3216X7R2J472M115AE			
	1005	0.50+0.10/-0.05	±10%					C1005X7R1H103K050BE
			±20%					C1005X7R1H103M050BE
10nF	1608	0.80 +0.15/-0.10	±10%				C1608X7R2A103K080AE	C1608X7R1H103K080AE
			±20%				C1608X7R2A103M080AE	C1608X7R1H103M080AE
	2012	0.85±0.15	±10%				C2012X7R2A103K085AE	
			±20%				C2012X7R2A103M085AE	
		1.25 +0.25/-0.20	±10%			C2012X7R2E103K125AE		
			±20%			C2012X7R2E103M125AE		
	3216	1.15±0.15	±10%		C3216X7R2J103K115AE			
			±20%		C3216X7R2J103M115AE			
	1005	0.50+0.10/-0.05	±10%					C1005X7R1H223K050BE
			±20%					C1005X7R1H223M050BE
22nF	1608	0.80+0.15/-0.10	±10%				C1608X7R2A223K080AE	C1608X7R1H223K080AE
			±20%				C1608X7R2A223M080AE	C1608X7R1H223M080AE
	2012	1.25 +0.25/-0.20	±10%			C2012X7R2E223K125AE	C2012X7R2A223K125AE	
			±20%			C2012X7R2E223M125AE	C2012X7R2A223M125AE	
		1.15±0.15	±10%			C3216X7R2E223K115AE		
			±20%			C3216X7R2E223M115AE		
	3216	1.30±0.20	±10%		C3216X7R2J223K130AE			
			±20%		C3216X7R2J223M130AE			
	33nF	3216	1.60+0.30/-0.20		C3216X7R2J333K160AE			
					C3216X7R2J333M160AE			
47nF	1005	0.50+0.10/-0.05	±10%					C1005X7R1H473K050BE
			±20%					C1005X7R1H473M050BE
	1608	0.80+0.15/-0.10	±10%					C1608X7R1H473K080AE
			±20%					C1608X7R1H473M080AE
	2012	1.25+0.25/-0.20	±10%				C2012X7R2A473K125AE	
			±20%				C2012X7R2A473M125AE	
	3216	1.60+0.30/-0.20	±10%			C3216X7R2E473K160AE		
			±20%			C3216X7R2E473M160AE		
	3225	2.00 +0.30/-0.20	±10%		C3225X7R2J473K200AE			
			±20%		C3225X7R2J473M200AE			

⚠ Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use.
Please note that the contents may change without any prior notice due to reasons such as upgrading.

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Table

Class 2 (Temperature Stable)

Temperature Characteristics: X7R (-55 to +125°C, ±15%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number	Rated Voltage Edc : 630V	Rated Voltage Edc : 250V	Rated Voltage Edc : 100V	Rated Voltage Edc : 50V
68nF	3225	2.00+0.30/-0.20	±10%	C3225X7R2J683K200AE				
			±20%	C3225X7R2J683M200AE				
	1005	0.50+0.10/-0.05	±10%					C1005X7R1H104K050BE
			±20%					C1005X7R1H104M050BE
100nF	1608	0.80 +0.15/-0.10	±10%					C1608X7R1H104K080AE
			±20%					C1608X7R1H104M080AE
	2012	1.25 +0.25/-0.20	±10%			C2012X7R2A104K125AE	C2012X7R1H104K125AE	
			±20%			C2012X7R2A104M125AE	C2012X7R1H104M125AE	
	3216	1.60 +0.30/-0.20	±10%		C3216X7R2E104K160AE	C3216X7R2A104K160AE		
			±20%		C3216X7R2E104M160AE	C3216X7R2A104M160AE		
	3225	2.00 +0.30/-0.20	±10%		C3225X7R2E104K200AE			
			±20%		C3225X7R2E104M200AE			
220nF	4532	2.30+0.30/-0.20	±10%	C4532X7R2J104K230KE				
			±20%	C4532X7R2J104M230KE				
	1608	0.80+0.15/-0.10	±10%					C1608X7R1H224K080AE
			±20%					C1608X7R1H224M080AE
	2012	1.25+0.25/-0.20	±10%					C2012X7R1H224K125AE
			±20%					C2012X7R1H224M125AE
	3216	1.15±0.15	±10%			C3216X7R2A224K115AE		
			±20%			C3216X7R2A224M115AE		
470nF	3225	2.00 +0.30/-0.20	±10%		C3225X7R2E224K200AE			
			±20%		C3225X7R2E224M200AE			
	5750	2.30+0.30/-0.20	±10%	C5750X7R2J224K230KE				
			±20%	C5750X7R2J224M230KE				
	1608	0.80 +0.15/-0.10	±10%					C1608X7R1H474K080AE
			±20%					C1608X7R1H474M080AE
1µF	2012	1.25 +0.25/-0.20	±10%					C2012X7R1H474K125AE
			±20%					C2012X7R1H474M125AE
	3216	1.60 +0.30/-0.20	±10%			C3216X7R2A474K160AE		
			±20%			C3216X7R2A474M160AE		
	3225	2.00+0.30/-0.20	±10%			C3225X7R2A474K200AE		
			±20%			C3225X7R2A474M200AE		
2.2µF	4532	2.00 +0.30/-0.20	±10%		C4532X7R2E474K230KE			
			±20%		C4532X7R2E474M230KE			
	2012	1.25 +0.25/-0.20	±10%					C2012X7R1H105K125AE
			±20%					C2012X7R1H105M125AE
	3216	1.60 +0.30/-0.20	±10%			C3216X7R2A105K160AE	C3216X7R1H105K160AE	
			±20%			C3216X7R2A105M160AE	C3216X7R1H105M160AE	
4.7µF	3225	2.00+0.30/-0.20	±10%			C3225X7R2A105K200AE		
			±20%			C3225X7R2A105M200AE		
	5750	2.00 +0.30/-0.20	±10%		C5750X7R2E105K230KE			
			±20%		C5750X7R2E105M230KE			
	2012	1.25 +0.25/-0.20	±10%					C2012X7R1H225K125AE
			±20%					C2012X7R1H225M125AE
2.2µF	3216	1.60 +0.30/-0.20	±10%					C3216X7R1H225K160AE
			±20%					C3216X7R1H225M160AE
	3225	2.00+0.30/-0.20	±10%					C3225X7R1H225K200AE
			±20%					C3225X7R1H225M200AE
	2.30 +0.30/-0.20		±10%			C3225X7R2A225K230AE		
			±20%			C3225X7R2A225M230AE		
4.7µF	3216	1.60 +0.30/-0.20	±10%					C3216X7R1H475K160AE
			±20%					C3216X7R1H475M160AE

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Table

Class 2 (Temperature Stable)

Temperature Characteristics: X7R (-55 to +125°C, ±15%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number			
				Rated Voltage Edc : 35V	Rated Voltage Edc : 25V	Rated Voltage Edc : 16V	Rated Voltage Edc : 10V
220nF	1005	0.50 +0.10/-0.05	±10%	C1005X7R1V224K050BE	C1005X7R1E224K050BE	C1005X7R1C224K050BE	
			±20%	C1005X7R1V224M050BE	C1005X7R1E224M050BE	C1005X7R1C224M050BE	
470nF	1608	0.80 +0.15/-0.10	±10%	C1608X7R1V474K080AE	C1608X7R1E474K080AE		
			±20%	C1608X7R1V474M080AE	C1608X7R1E474M080AE		
1µF	1608	0.80 +0.15/-0.10	±10%	C1608X7R1V105K080AE	C1608X7R1E105K080AE		
			±20%	C1608X7R1V105M080AE	C1608X7R1E105M080AE		
	2012	1.25 +0.25/-0.20	±10%	C2012X7R1V105K125AE			
			±20%	C2012X7R1V105M125AE			
2.2µF	1608	0.80 +0.15/-0.10	±10%				C1608X7R1A225K080AE
			±20%				C1608X7R1A225M080AE
	2012	1.25 +0.25/-0.20	±10%	C2012X7R1V225K125AE	C2012X7R1E225K125AE		
			±20%	C2012X7R1V225M125AE	C2012X7R1E225M125AE		
4.7µF	3216	1.60 +0.30/-0.20	±10%	C3216X7R1V225K160AE	C3216X7R1E225K160AE		
			±20%	C3216X7R1V225M160AE	C3216X7R1E225M160AE		
	2012	1.25 +0.25/-0.20	±10%	C2012X7R1V475K125AE	C2012X7R1E475K125AE	C2012X7R1C475K125AE	
			±20%	C2012X7R1V475M125AE	C2012X7R1E475M125AE	C2012X7R1C475M125AE	
10µF	3216	1.60 +0.30/-0.20	±10%	C3216X7R1V475K160AE	C3216X7R1E475K160AE		
			±20%	C3216X7R1V475M160AE	C3216X7R1E475M160AE		
	2012	1.25 +0.25/-0.20	±10%				C2012X7R1A106K125AE
			±20%				C2012X7R1A106M125AE
22µF	3216	1.60 +0.30/-0.20	±10%	C3216X7R1V106K160AE	C3216X7R1E106K160AE	C3216X7R1C106K160AE	
			±20%	C3216X7R1V106M160AE	C3216X7R1E106M160AE	C3216X7R1C106M160AE	

Class 2 (Temperature Stable)

Temperature Characteristics: X7S (-55 to +125°C, ±22%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number		
				Rated Voltage Edc : 100V	Rated Voltage Edc : 50V	Rated Voltage Edc : 16V
47nF	1608	0.80 +0.15/-0.10	±10%	C1608X7S2A473K080AE		
			±20%	C1608X7S2A473M080AE		
100nF	1608	0.80 +0.15/-0.10	±10%	C1608X7S2A104K080AE		
			±20%	C1608X7S2A104M080AE		
220nF	2012	0.85±0.15	±10%	C2012X7S2A224K085AE		
			±20%	C2012X7S2A224M085AE		
470nF	2012	1.25 +0.25/-0.20	±10%	C2012X7S2A474K125AE		
			±20%	C2012X7S2A474M125AE		
1µF	2012	1.25 +0.25/-0.20	±10%	C2012X7S2A105K125AE		
			±20%	C2012X7S2A105M125AE		
2.2µF	3216	1.60 +0.30/-0.20	±10%	C3216X7S2A225K160AE		
			±20%	C3216X7S2A225M160AE		
3.3µF	3225	2.00 +0.30/-0.20	±10%	C3225X7S2A335K200AE		
			±20%	C3225X7S2A335M200AE		
4.7µF	3225	2.00 +0.30/-0.20	±10%	C3225X7S2A475K200AE		
			±20%	C3225X7S2A475M200AE		
	3225	2.30 +0.30/-0.20	±10%		C3225X7S1H475K230AE	
			±20%		C3225X7S1H475M230AE	
10µF	3225	2.50 ±0.30	±10%		C3225X7S1H106K250AE	
			±20%		C3225X7S1H106M250AE	
22µF	5750	2.30 +0.30/-0.20	±10%	C5750X7S2A106K230KE		
			±20%	C5750X7S2A106M230KE		
22µF	7563	2.30 (2.50max.)	±20%		C7563X7S1H226M230LE	
			±20%			C7563X7S1C107M280LE
100µF	7563	2.80 (3.00max.)	±20%			

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Table

Class 2 (Temperature Stable)

Temperature Characteristics: X7T (-55 to +125°C, +22/-33%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number		
				Rated Voltage Edc : 630V	Rated Voltage Edc : 450V	Rated Voltage Edc : 250V
10 nF	2012	0.85 ± 0.15	± 10%		C2012X7T2W103K085AE	
			± 20%		C2012X7T2W103M085AE	
22 nF	2012	1.25 +0.25/-0.20	± 10%		C2012X7T2W223K125AE	
			± 20%		C2012X7T2W223M125AE	
47 nF	2012	1.25 +0.25/-0.20	± 10%		C2012X7T2W473K125AE	C2012X7T2E473K125AE
			± 20%		C2012X7T2W473M125AE	C2012X7T2E473M125AE
	3216	1.60 +0.30/-0.20	± 10%	C3216X7T2J473K160AE		
			± 20%	C3216X7T2J473M160AE		
100 nF	2012	1.25 +0.25/-0.20	±10%			C2012X7T2E104K125AE
			±20%			C2012X7T2E104M125AE
	3216	1.60 +0.30/-0.20	±10%		C3216X7T2W104K160AE	
			±20%		C3216X7T2W104M160AE	
	3225	1.60 +0.30/-0.20	±10%	C3225X7T2J104K160AE		
			±20%	C3225X7T2J104M160AE		
150nF	3225	2.00 +0.30/-0.20	±10%	C3225X7T2J154K200AE		
			±20%	C3225X7T2J154M200AE		
220 nF	3216	1.60 +0.30/-0.20	±10%			C3216X7T2E224K160AE
			±20%			C3216X7T2E224M160AE
	3225	2.00 +0.30/-0.20	±10%		C3225X7T2W224K200AE	
			±20%		C3225X7T2W224M200AE	
330nF	4532	2.00 +0.30/-0.20	±10%	C4532X7T2J224K200KE		
			±20%	C4532X7T2J224M200KE		
470 nF	3225	2.00 +0.30/-0.20	±10%			C3225X7T2E334K200AE
			±20%			C3225X7T2E334M200AE
	4532	2.30 +0.30/-0.20	±10%		C4532X7T2W474K230KE	
			±20%		C4532X7T2W474M230KE	
1 μF	5750	2.50 ± 0.30	±10%	C5750X7T2J474K250KE		
			±20%	C5750X7T2J474M250KE		
2.2 uF	4532	2.50 ± 0.30	± 10%			C4532X7T2E105K250KE
			± 20%			C4532X7T2E105M250KE
	5750	2.50 ± 0.30	± 10%	C5750X7T2W105K250KE		
			± 20%	C5750X7T2W105M250KE		

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Table

Class 2 (Temperature Stable)

Temperature Characteristics: X8R (-55 to +150°C, ±15%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number			
				Rated Voltage Edc : 100V	Rated Voltage Edc : 50V	Rated Voltage Edc : 25V	Rated Voltage Edc : 16V
150pF	1005	0.50+0.10/-0.05	±10%	C1005X8R2A151K050BE	C1005X8R1H151K050BE		
			±20%	C1005X8R2A151M050BE	C1005X8R1H151M050BE		
220pF	1005	0.50+0.10/-0.05	±10%	C1005X8R2A221K050BE	C1005X8R1H221K050BE		
			±20%	C1005X8R2A221M050BE	C1005X8R1H221M050BE		
330pF	1005	0.50+0.10/-0.05	±10%	C1005X8R2A331K050BE	C1005X8R1H331K050BE		
			±20%	C1005X8R2A331M050BE	C1005X8R1H331M050BE		
470pF	1005	0.50+0.10/-0.05	±10%	C1005X8R2A471K050BE	C1005X8R1H471K050BE		
			±20%	C1005X8R2A471M050BE	C1005X8R1H471M050BE		
680pF	1005	0.50+0.10/-0.05	±10%	C1005X8R2A681K050BE	C1005X8R1H681K050BE		
			±20%	C1005X8R2A681M050BE	C1005X8R1H681M050BE		
1nF	1005	0.50+0.10/-0.05	±10%	C1005X8R2A102K050BE	C1005X8R1H102K050BE		
			±20%	C1005X8R2A102M050BE	C1005X8R1H102M050BE		
	1608	0.80+0.15/-0.10	±10%	C1608X8R2A102K080AE	C1608X8R1H102K080AE		
			±20%	C1608X8R2A102M080AE	C1608X8R1H102M080AE		
1.5nF	1005	0.50+0.10/-0.05	±10%	C1005X8R2A152K050BE	C1005X8R1H152K050BE		
			±20%	C1005X8R2A152M050BE	C1005X8R1H152M050BE		
	1608	0.80+0.15/-0.10	±10%	C1608X8R2A152K080AE	C1608X8R1H152K080AE		
			±20%	C1608X8R2A152M080AE	C1608X8R1H152M080AE		
2.2nF	1005	0.50+0.10/-0.05	±10%	C1005X8R2A222K050BE	C1005X8R1H222K050BE		
			±20%	C1005X8R2A222M050BE	C1005X8R1H222M050BE		
	1608	0.80+0.15/-0.10	±10%	C1608X8R2A222K080AE	C1608X8R1H222K080AE		
			±20%	C1608X8R2A222M080AE	C1608X8R1H222M080AE		
3.3nF	1005	0.50+0.10/-0.05	±10%	C1005X8R2A332K050BE	C1005X8R1H332K050BE		
			±20%	C1005X8R2A332M050BE	C1005X8R1H332M050BE		
	1608	0.80+0.15/-0.10	±10%	C1608X8R2A332K080AE	C1608X8R1H332K080AE		
			±20%	C1608X8R2A332M080AE	C1608X8R1H332M080AE		
4.7nF	1005	0.50+0.10/-0.05	±10%		C1005X8R1H472K050BE		
			±20%		C1005X8R1H472M050BE		
	1608	0.80+0.15/-0.10	±10%	C1608X8R2A472K080AE	C1608X8R1H472K080AE		
			±20%	C1608X8R2A472M080AE	C1608X8R1H472M080AE		
6.8nF	1005	0.50+0.10/-0.05	±10%		C1005X8R1H682K050BE	C1005X8R1E682K050BE	
			±20%		C1005X8R1H682M050BE	C1005X8R1E682M050BE	
	1608	0.80+0.15/-0.10	±10%	C1608X8R2A682K080AE	C1608X8R1H682K080AE		
			±20%	C1608X8R2A682M080AE	C1608X8R1H682M080AE		
10nF	1005	0.50+0.10/-0.05	±10%		C1005X8R1H103K050BE	C1005X8R1E103K050BE	
			±20%		C1005X8R1H103M050BE	C1005X8R1E103M050BE	
	1608	0.80+0.15/-0.10	±10%	C1608X8R2A103K080AE	C1608X8R1H103K080AE		
			±20%	C1608X8R2A103M080AE	C1608X8R1H103M080AE		
15nF	1005	0.50+0.10/-0.05	±10%			C1005X8R1E153K050BE	
			±20%			C1005X8R1E153M050BE	
	1608	0.80+0.15/-0.10	±10%	C1608X8R2A153K080AE	C1608X8R1H153K080AE		
			±20%	C1608X8R2A153M080AE	C1608X8R1H153M080AE		
22nF	1005	0.50+0.10/-0.05	±10%			C1005X8R1E223K050BE	
			±20%			C1005X8R1E223M050BE	
	1608	0.80+0.15/-0.10	±10%	C1608X8R2A223K080AE	C1608X8R1H223K080AE		
			±20%	C1608X8R2A223M080AE	C1608X8R1H223M080AE		
	2012	1.25+0.25/-0.20	±10%	C2012X8R2A223K125AE			
			±20%	C2012X8R2A223M125AE			
	1005	0.50+0.10/-0.05	±10%				C1005X8R1C333K050BE
			±20%				C1005X8R1C333M050BE
33nF	1608	0.80+0.15/-0.10	±10%		C1608X8R1H333K080AE		
			±20%		C1608X8R1H333M080AE		
	2012	1.25+0.25/-0.20	±10%	C2012X8R2A333K125AE			
			±20%	C2012X8R2A333M125AE			
	1005	0.50+0.10/-0.05	±10%				C1005X8R1C473K050BE
			±20%				C1005X8R1C473M050BE
47nF	1608	0.80+0.15/-0.10	±10%		C1608X8R1H473K080AE		
			±20%		C1608X8R1H473M080AE		
	2012	1.25+0.25/-0.20	±10%	C2012X8R2A473K125AE			
			±20%	C2012X8R2A473M125AE			

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Table

Class 2 (Temperature Stable)

Temperature Characteristics: X8R (-55 to +150°C, ±15%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number				
				Rated Voltage Edc : 100V	Rated Voltage Edc : 50V	Rated Voltage Edc : 25V	Rated Voltage Edc : 16V	
68nF	1608	0.80+0.15/-0.10	±10%		C1608X8R1H683K080AE	C1608X8R1E683K080AE		
			±20%		C1608X8R1H683M080AE	C1608X8R1E683M080AE		
	2012	1.25+0.25/-0.20	±10%	C2012X8R2A683K125AE	C2012X8R1H683K125AE			
			±20%	C2012X8R2A683M125AE	C2012X8R1H683M125AE			
100nF	1608	0.80+0.15/-0.10	±10%		C1608X8R1H104K080AE	C1608X8R1E104K080AE		
			±20%		C1608X8R1H104M080AE	C1608X8R1E104M080AE		
	2012	1.25+0.25/-0.20	±10%		C2012X8R1H104K125AE			
			±20%		C2012X8R1H104M125AE			
150nF	3216	1.15±0.15	±10%	C3216X8R2A104K115AE				
			±20%	C3216X8R2A104M115AE				
	1608	0.80+0.15/-0.10	±10%			C1608X8R1E154K080AE		
			±20%			C1608X8R1E154M080AE		
220nF	2012	0.85±0.15	±10%			C2012X8R1E154K085AE		
			±20%			C2012X8R1E154M085AE		
	3216	1.60+0.30/-0.20	±10%	C3216X8R2A154K160AE				
			±20%	C3216X8R2A154M160AE				
330nF	1608	0.80+0.15/-0.10	±10%			C1608X8R1E224K080AE		
			±20%			C1608X8R1E224M080AE		
	2012	1.25+0.25/-0.20	±10%		C2012X8R1H224K125AE	C2012X8R1E224K125AE		
			±20%		C2012X8R1H224M125AE	C2012X8R1E224M125AE		
470nF	3216	1.60+0.30/-0.20	±10%	C3216X8R2A224K160AE				
			±20%	C3216X8R2A224M160AE				
	1608	0.80+0.15/-0.10	±10%				C1608X8R1C334K080AE	
			±20%				C1608X8R1C334M080AE	
680nF	2012	1.25+0.25/-0.20	±10%			C2012X8R1E334K125AE		
			±20%			C2012X8R1E334M125AE		
	3216	1.60+0.30/-0.20	±10%	C3216X8R2A334K160AE	C3216X8R1H334K160AE			
			±20%	C3216X8R2A334M160AE	C3216X8R1H334M160AE			
1µF	1608	0.80+0.15/-0.10	±10%				C1608X8R1C474K080AE	
			±20%				C1608X8R1C474M080AE	
	2012	1.25+0.25/-0.20	±10%			C2012X8R1E474K125AE		
			±20%			C2012X8R1E474M125AE		
1.5µF	3216	1.60+0.30/-0.20	±10%		C3216X8R1H474K160AE			
			±20%		C3216X8R1H474M160AE			
	3225	2.00+0.30/-0.20	±10%	C3225X8R2A474K200AE				
			±20%	C3225X8R2A474M200AE				
2.2µF	2012	1.25+0.25/-0.20	±10%				C2012X8R1C684K125AE	
			±20%				C2012X8R1C684M125AE	
	3216	1.60+0.30/-0.20	±10%		C3216X8R1H684K160AE			
			±20%		C3216X8R1H684M160AE			
3.3µF	3225	2.50±0.30	±10%	C3225X8R2A684K250AE				
			±20%	C3225X8R2A684M250AE				
	2012	1.25+0.25/-0.20	±10%				C2012X8R1C105K125AE	
			±20%				C2012X8R1C105M125AE	
4.7µF	3216	1.60+0.30/-0.20	±10%		C3216X8R1H105K160AE	C3216X8R1E105K160AE		
			±20%		C3216X8R1H105M160AE	C3216X8R1E105M160AE		
	1.5µF	3216	1.60+0.30/-0.20	±10%			C3216X8R1E155K160AE	
				±20%			C3216X8R1E155M160AE	
2.2µF	3216	1.60+0.30/-0.20	±10%			C3216X8R1E225K160AE		
			±20%			C3216X8R1E225M160AE		
	3.3µF	3216	1.60+0.30/-0.20	±10%				C3216X8R1C335K160AE
				±20%				C3216X8R1C335M160AE
4.7µF	3216	1.60+0.30/-0.20	±10%				C3216X8R1C475K160AE	
			±20%				C3216X8R1C475M160AE	
	3225	2.50±0.30	±10%			C3225X8R1E475K250AE		
			±20%			C3225X8R1E475M250AE		

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TDK:

CGA5L2X7R2A474K160AE	CGA6N3X7R2A225M230AE	CGA6N3X7S1H475M230AE	CGA4J3X7R1C475M125AE
CGA4J1X7R1V225M125AE	CGA6P3X7S1H106M250AE	CGA5L2X7R2A474M160AE	CGA6N3X7S1H475K230AE
CGA9N3X7S2A106M230KE	CGA4J1X7R1V225K125AE	CGA4J3X7S2A105M125AE	CGA5L2X7R2A105M160AE
CGA5L3X7R1H105K160AE	CGA5L3X7S2A225M160AE	CGA6N3X7R2A225K230AE	CGA9N3X7S2A106K230KE
CGA4J3X7R1H474K125AE	CGA5L1X7R1V475K160AE	CGA5L3X7R1H225K160AE	CGA4F3X7S2A224M085AE
CGA4J3X7S2A105K125AE	CGA5L1X7R1E106K160AE	CGA6M3X7S2A475M200AE	CGA5L1X7R1V475M160AE
CGA4J3X7R1C475K125AE	CGA4J3X7R1H105K125AE	CGA4J3X7R1H474M125AE	CGA5L3X7R1H225M160AE
CGA4J3X7S2A474K125AE	CGA5L1X7R1E106M160AE	CGA4F3X7S2A224K085AE	CGA5L2X7R2A105K160AE
CGA5L3X7R1H105M160AE	CGA5L3X7S2A225K160AE	CGA6P3X7S1H106K250AE	CGA6M3X7S2A475K200AE
C3225X7S3D102K200AA	CGA4J3X7S2A474M125AE	CGA5L1X7T2J473M160AE	CGA8P3X7T2E105K250KE
CGA9P4X7T2W105M250KE	CGA5K4X7R2J223K130AE	CGA9N3X7R2E105K230KE	CGA6M4X7R2J473M200AE
CGA8N3X7R2E474M230KE	CGA8N4X7T2W474K230KE	CGA4J3X7R2E223K125AE	CGA6M3X7R2E224K200AE
CGA9P1X7T2J474M250KE	CGA4J3X7T2E473K125AE	CGA4F4X7T2W103K085AE	CGA8N3X7R2E474K230KE
CGA5H4X7R2J103K115AE	CGA6M3X7R2E104K200AE	CGA5K4X7R2J223M130AE	CGA9N3X7R2E105M230KE
CGA8M1X7T2J224M200KE	CGA6M4X7T2W224M200AE	CGA6L1X7T2J104K160AE	CGA5L1X7T2J473K160AE
CGA4J3X7R2E103M125AE	CGA4J3X7T2E473M125AE	CGA5H4X7R2J103M115AE	CGA6M3X7R2E224M200AE
CGA8M1X7T2J224K200KE	CGA4J4X7T2W223K125AE	CGA4J3X7R2E223M125AE	CGA5L4X7T2W104K160AE
CGA9P3X7T2E225K250KE	CGA8P3X7T2E105M250KE	CGA4J4X7T2W223M125AE	CGA6M3X7R2E104M200AE
CGA6L1X7T2J104M160AE	CGA4F4X7T2W103M085AE	CGA4J4X7T2W473M125AE	CGA6M4X7T2W224K200AE
CGA5L3X7R2E104K160AE	CGA9P4X7T2W105K250KE	CGA4J3X7T2E104K125AE	CGA6M4X7R2J473K200AE
CGA4J3X7T2E104M125AE	CGA5L4X7T2W104M160AE	CGA5L3X7T2E224K160AE	CGA9P1X7T2J474K250KE
CGA4J3X7R2E103K125AE	CGA9P3X7T2E225M250KE	CGA8N4X7T2W474M230KE	CGA5L3X7R2E104M160AE
CGA5L3X7T2E224M160AE	CGA4J4X7T2W473K125AE	CGA4J3X7R1H105M125AE	CGA3E2X7R1H102M080AE
C4532X7R3D222M130KE	CGA8L1X7S3A103M160KE	CGA7K1X7R3D102M130KE	C7563X7S1H226M230LE
CGA4J2X7R2A104M125AE	CGA3E2X7R1H104K080AE	CGA5L2X7R2A104M160AE	CGA4J2X7R1H104K125AE