

MULTILAYER CERAMIC CHIP CAPACITORS



CGJ Series **High Reliability Grade** **Mid Voltage (100 to 630V)**

Type:

CGJ3 [EIA CC0603]
CGJ4 [EIA CC0805]
CGJ5 [EIA CC1206]
CGJ6 [EIA CC1210]



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



CGJ Series Mid Voltage (100 to 630V)

Type: CGJ3 [EIA CC0603], CGJ4 [EIA CC0805], CGJ5 [EIA CC1206], CGJ6 [EIA CC1210]

Features

- Highly reliable products with long lifespans.
- Reliability tests based on AEC-Q200 requirements.
- Guaranteed TC Bias.
- UHF (Ultra High Frequency) RFID tag to allow integration with customer RFID programs such as inventory management is available by option.
- Tamper proof seal to assist in the identification of authentic TDK CGJ products.
- CGJ customer priority backed by TDK factory support.

Applications

- Smart Meter, Smart Grid, LED Lighting
- Industrial Application, Telecom Base Station
- Solar Micro-inverters, Charging station
- Military Communication Equipment
- Class 1 & 2 Medical Equipment
- Applications that require extended life performance

Shape & Dimensions



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

Catalog Number Construction

CGJ • 6 • M • 3 • X7S • 2A • 475 • K • 200 • A • A

Series Name

Dimensions L x W (mm)

Code	Length	Width	Terminal
3	1.60 ± 0.10	0.80 ± 0.10	0.20 min.
4	2.00 ± 0.20	1.25 ± 0.20	0.20 min.
5	3.20 ± 0.20	1.60 ± 0.20	0.20 min.
6	3.20 ± 0.40	2.50 ± 0.30	0.20 min.

* Standard dimensions

Thickness T Code (mm)

Code	Thickness
C	0.60 mm
E	0.80 mm
F	0.85 mm
H	1.15 mm
J	1.25 mm
K	1.30 mm
L	1.60 mm
M	2.00 mm

Voltage Condition for Life Test

Symbol	Condition
1	1 × R.V.
2	2 × R.V.
3	1.5 × R.V.
4	1.2 × R.V.

Temperature Characteristics

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

Rated Voltage (DC)

Code	Voltage (DC)
2A	100V
2D	200V
2H	500V

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 = 100nF = 1μF

Capacitance Tolerance

Code	Tolerance
J	± 5%
K	± 10%

Nominal Thickness

Code	Thickness
060	0.60 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

Packaging Style

Code	Style
A	178 mm Reel, 4 mm Pitch

Special Reserved Code

Code	Description
A	TDK Internal Code

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MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Chart

CGJ3(1608) [EIA CC0603]

Capacitance Range Chart

Temperature Characteristics: C0G ($0 \pm 30 \text{ppm}/^\circ\text{C}$), X7R ($\pm 15\%$), X7S ($\pm 22\%$)

Rated Voltage: 200V (2D), 100V (2A)

Capacitance		Tolerance	C0G		X7R	X7S
(pF)	Code		2D (200V)	2A (100V)	2A (100V)	2A (100V)
100	101	J: $\pm 5\%$	■	■		
120	121					
150	151					
180	181					
220	221					
270	271					
330	331					
390	391					
470	471					
560	561					
680	681					
820	821					
1,000	102				C0G; J: $\pm 5\%$	
1,200	122					
1,500	152					
2,200	222	X7R, X7S; K: $\pm 10\%$		■		
3,300	332					
4,700	472					
6,800	682					
10,000	103					
33,000	333					■
47,000	473					
68,000	683					
100,000	104				■	

Standard Thickness
 0.80 mm

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Chart

CGJ4(2012) [EIA CC0805]

Capacitance Range Chart

Temperature Characteristics: C0G ($0 \pm 30\text{ppm}/^\circ\text{C}$), X7R ($\pm 15\%$), X7S ($\pm 22\%$), X7T ($+22\%/-33\%$)

Rated Voltage: 200V (2D), 100V (2A)



MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Chart

CGJ5(3216) [EIA CC1206]

Capacitance Range Chart

Temperature Characteristics: C0G (0 ± 30ppm/°C), X7R (±15%), X7S (±22%), X7T (+22%/-33%)

Rated Voltage: 500V (2H), 200V (2D), 100V (2A)



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MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance Range Chart

CGJ6(3225) [EIA CC1210]

Capacitance Range Chart

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

Rated Voltage: 500V (2H), 200V (2D), 100V (2A)

Capacitance		Tolerance	X7R			X7S	X7T	
(pF)	Code		2H (500V)	2D (200V)	2A (100V)	2A (100V)	2H (500V)	2D (200V)
47,000	473	K: $\pm 10\%$	■					
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				■			
3,300,000	335					■		
4,700,000	475					■		

Standard Thickness

■ 1.60 mm

■ 2.00 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: 500V	Rated Voltage Edc: 200V	Rated Voltage Edc: 100V
100 pF	1608	0.80 ± 0.10	± 5%		CGJ3E3C0G2D101J080AA	CGJ3E2C0G2A101J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A101J060AA
	3216	0.60 ± 0.15	± 5%	CGJ5C4C0G2H101J060AA		
120 pF	1608	0.80 ± 0.10	± 5%		CGJ3E3C0G2D121J080AA	CGJ3E2C0G2A121J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A121J060AA
	3216	0.60 ± 0.15	± 5%	CGJ5C4C0G2H121J060AA		
150 pF	1608	0.80 ± 0.10	± 5%		CGJ3E3C0G2D151J080AA	CGJ3E2C0G2A151J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A151J060AA
	3216	0.60 ± 0.15	± 5%	CGJ5C4C0G2H151J060AA		
180 pF	1608	0.80 ± 0.10	± 5%		CGJ3E3C0G2D181J080AA	CGJ3E2C0G2A181J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A181J060AA
	3216	0.60 ± 0.15	± 5%	CGJ5C4C0G2H181J060AA		
220 pF	1608	0.80 ± 0.10	± 5%		CGJ3E3C0G2D221J080AA	CGJ3E2C0G2A221J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A221J060AA
	3216	0.60 ± 0.15	± 5%	CGJ5C4C0G2H221J060AA		
270 pF	1608	0.80 ± 0.10	± 5%		CGJ3E3C0G2D271J080AA	CGJ3E2C0G2A271J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A271J060AA
	3216	0.60 ± 0.15	± 5%	CGJ5C4C0G2H271J060AA		
330 pF	1608	0.80 ± 0.10	± 5%		CGJ3E3C0G2D331J080AA	CGJ3E2C0G2A331J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A331J060AA
	3216	0.60 ± 0.15	± 5%	CGJ5C4C0G2H331J060AA		
390 pF	1608	0.80 ± 0.10	± 5%		CGJ3E3C0G2D391J080AA	CGJ3E2C0G2A391J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A391J060AA
	3216	0.60 ± 0.15	± 5%	CGJ5C4C0G2H391J060AA		
470 pF	1608	0.80 ± 0.10	± 5%		CGJ3E3C0G2D471J080AA	CGJ3E2C0G2A471J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A471J060AA
	3216	0.85 ± 0.15	± 5%	CGJ5F4C0G2H471J085AA		
560 pF	1608	0.80 ± 0.10	± 5%		CGJ3E3C0G2D561J080AA	CGJ3E2C0G2A561J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A561J060AA
	3216	0.85 ± 0.15	± 5%	CGJ5F4C0G2H561J085AA		
680 pF	1608	0.80 ± 0.10	± 5%		CGJ3E3C0G2D681J080AA	CGJ3E2C0G2A681J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A681J060AA
	3216	0.85 ± 0.15	± 5%	CGJ5F4C0G2H681J085AA		
820 pF	1608	0.80 ± 0.10	± 5%			CGJ3E2C0G2A821J080AA
	2012	0.60 ± 0.15	± 5%		CGJ4C3C0G2D821J060AA	CGJ4C2C0G2A821J060AA
	3216	0.85 ± 0.15	± 5%	CGJ5F4C0G2H821J085AA		
1 nF	1608	0.80 ± 0.10	± 5%			CGJ3E2C0G2A102J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A102J060AA
	3216	0.85 ± 0.15	± 5%		CGJ4F3C0G2D102J085AA	
1.2 nF	1608	0.80 ± 0.10	± 5%			CGJ3E2C0G2A122J080AA
	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A122J060AA
	3216	0.85 ± 0.15	± 5%	CGJ5F4C0G2H122J085AA		
1.5 nF	2012	0.60 ± 0.15	± 5%			CGJ4C2C0G2A152J060AA
	3216	0.85 ± 0.15	± 5%		CGJ4F3C0G2D152J085AA	
	3216	1.15 ± 0.15	± 5%	CGJ5H4C0G2H152J115AA		
1.8 nF	2012	0.85 ± 0.15	± 5%			CGJ4F2C0G2A182J085AA
	3216	1.25 ± 0.20	± 5%		CGJ4J3C0G2D182J125AA	
	3216	1.15 ± 0.15	± 5%	CGJ5H4C0G2H182J115AA		
2.2 nF	2012	0.85 ± 0.15	± 5%			CGJ4F2C0G2A222J085AA
	3216	1.25 ± 0.20	± 5%		CGJ4J3C0G2D222J125AA	
	3216	1.15 ± 0.15	± 5%	CGJ5H4C0G2H222J115AA		
2.7 nF	2012	1.25 ± 0.20	± 5%		CGJ4J3C0G2D272J125AA	CGJ4J2C0G2A272J125AA
	3216	1.60 ± 0.20	± 5%	CGJ5L4C0G2H272J160AA		
	2012	1.25 ± 0.20	± 5%			CGJ4J2C0G2A332J125AA
3.3 nF	3216	0.85 ± 0.15	± 5%		CGJ5F3C0G2D332J085AA	
	3216	1.60 ± 0.20	± 5%	CGJ5L4C0G2H332J160AA		

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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: 500V	Rated Voltage Edc: 200V	Rated Voltage Edc: 100V
3.9 nF	2012	1.25 ± 0.20	± 5%			CGJ4J2C0G2A392J125AA
		0.60 ± 0.15	± 5%			CGJ5C2C0G2A392J060AA
	3216	0.85 ± 0.15	± 5%	CGJ5F4C0G2H392J085AA		
		1.15 ± 0.15	± 5%		CGJ5H3C0G2D392J115AA	
4.7 nF	2012	1.25 ± 0.20	± 5%			CGJ4J2C0G2A472J125AA
	3216	0.85 ± 0.15	± 5%	CGJ5F4C0G2H472J085AA		CGJ5F2C0G2A472J085AA
		1.15 ± 0.15	± 5%		CGJ5H3C0G2D472J115AA	
5.6 nF	3216	0.85 ± 0.15	± 5%			CGJ5F2C0G2A562J085AA
		1.15 ± 0.15	± 5%	CGJ5H4C0G2H562J115AA	CGJ5H3C0G2D562J115AA	
6.8 nF	3216	1.15 ± 0.15	± 5%	CGJ5H4C0G2H682J115AA		CGJ5H2C0G2A682J115AA
		1.60 ± 0.20	± 5%		CGJ5L3C0G2D682J160AA	
8.2 nF	3216	1.15 ± 0.15	± 5%			CGJ5H2C0G2A822J115AA
		1.60 ± 0.20	± 5%	CGJ5L4C0G2H822J160AA	CGJ5L3C0G2D822J160AA	
10 nF	3216	1.15 ± 0.15	± 5%			CGJ5H2C0G2A103J115AA
		1.60 ± 0.20	± 5%	CGJ5L4C0G2H103J160AA		

Class 2 (Temperature Stable)

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

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number		
				Rated Voltage Edc: 500V	Rated Voltage Edc: 200V	Rated Voltage Edc: 100V
1 nF	1608	0.80 ± 0.10	± 10%			CGJ3E2X7R2A102K080AA
	3216	1.15 ± 0.15	± 10%	CGJ5H4X7R2H102K115AA		
1.5 nF	1608	0.80 ± 0.10	± 10%			CGJ3E2X7R2A152K080AA
	3216	1.15 ± 0.15	± 10%	CGJ5H4X7R2H152K115AA		
2.2 nF	1608	0.80 ± 0.10	± 10%			CGJ3E2X7R2A222K080AA
	3216	1.15 ± 0.15	± 10%	CGJ5H4X7R2H222K115AA		
3.3 nF	1608	0.80 ± 0.10	± 10%			CGJ3E2X7R2A332K080AA
	3216	1.15 ± 0.15	± 10%	CGJ5H4X7R2H332K115AA		
4.7 nF	1608	0.80 ± 0.10	± 10%			CGJ3E2X7R2A472K080AA
	3216	1.15 ± 0.15	± 10%	CGJ5H4X7R2H472K115AA		
6.8 nF	1608	0.80 ± 0.10	± 10%			CGJ3E2X7R2A682K080AA
	2012	1.25 ± 0.20	± 10%		CGJ4J3X7R2D682K125AA	
		3216	1.15 ± 0.15	± 10%	CGJ5H4X7R2H682K115AA	
10 nF	1608	0.80 ± 0.10	± 10%			CGJ3E2X7R2A103K080AA
	3216	1.15 ± 0.15	± 10%	CGJ5H4X7R2H103K115AA	CGJ4J3X7R2D103K125AA	
15 nF		2012	1.25 ± 0.20	± 10%		CGJ4J3X7R2D153K125AA
	3216	1.15 ± 0.15	± 10%		CGJ5H3X7R2D153K115AA	
22 nF		2012	1.25 ± 0.20	± 10%		CGJ4J3X7R2D223K125AA
	3216	1.15 ± 0.15	± 10%		CGJ5H3X7R2D223K115AA	
33 nF		2012	1.25 ± 0.20	± 10%		
	3216	1.15 ± 0.15	± 10%			CGJ5H2X7R2A333K115AA
47 nF		2012	1.25 ± 0.20	± 10%		
	3216	1.15 ± 0.15	± 10%			CGJ5H2X7R2A473K115AA
68 nF		3225	2.00 ± 0.20	± 10%	CGJ6M4X7R2H473K200AA	CGJ5L3X7R2D473K160AA
	3216	1.60 ± 0.20	± 10%		CGJ5L3X7R2D683K160AA	CGJ5L2X7R2A683K160AA
3225		2.00 ± 0.20	± 10%	CGJ6M4X7R2H683K200AA		
	100 nF	3216	1.60 ± 0.20	± 10%		CGJ5L3X7R2D104K160AA
3225		2.00 ± 0.20	± 10%		CGJ6M3X7R2D104K200AA	
150 nF	3216	1.60 ± 0.20	± 10%			CGJ5L2X7R2A154K160AA
	3225	2.00 ± 0.20	± 10%		CGJ6M3X7R2D154K200AA	
220 nF	3216	1.15 ± 0.15	± 10%			CGJ5H2X7R2A224K115AA
	3225	2.00 ± 0.20	± 10%		CGJ6M3X7R2D224K200AA	
330 nF	3216	1.30 ± 0.20	± 10%			CGJ5K2X7R2A334K130AA
	3225	2.00 ± 0.20	± 10%			CGJ6M2X7R2A334K200AA

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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: 500V	Rated Voltage Edc: 100V
470 nF	3216	1.60 ± 0.20	± 10%		CGJ5L2X7R2A474K160AA
	3225	2.00 ± 0.20	± 10%		CGJ6M2X7R2A474K200AA
680 nF	3225	1.60 ± 0.20	± 10%	CGJ6L2X7R2H684K160AA	
1 µF	3225	2.00 ± 0.20	± 10%		CGJ6M2X7R2A105K200AA

Class 2 (Temperature Stable)

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

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number	
				Rated Voltage Edc: 100V	
33 nF	1608	0.80 ± 0.10	± 10%	CGJ3E3X7S2A333K080AA	
47 nF	1608	0.80 ± 0.10	± 10%	CGJ3E3X7S2A473K080AA	
68 nF	1608	0.80 ± 0.10	± 10%	CGJ3E3X7S2A683K080AA	
100 nF	1608	0.80 ± 0.10	± 10%	CGJ3E3X7S2A104K080AA	
330 nF	2012	1.25 ± 0.20	± 10%	CGJ4J3X7S2A334K125AA	
470 nF	2012	1.25 ± 0.20	± 10%	CGJ4J3X7S2A474K125AA	
1.5 µF	3216	1.60 ± 0.20	± 10%	CGJ5L3X7S2A155K160AA	
3.3 µF	3225	2.00 ± 0.20	± 10%	CGJ6M3X7S2A335K200AA	
4.7 µF	3225	2.00 ± 0.20	± 10%	CGJ6M3X7S2A475K200AA	

Class 2 (Temperature Stable)

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

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number	
				Rated Voltage Edc: 500V	Rated Voltage Edc: 200V
22 nF	3216	1.15 ± 0.15	± 10%	CGJ5H4X7T2H223K115AA	
33 nF	2012	1.25 ± 0.20	± 10%		CGJ4J3X7T2D333K125AA
	3216	1.15 ± 0.15	± 10%	CGJ5H4X7T2H333K115AA	
47 nF	2012	1.25 ± 0.20	± 10%		CGJ4J3X7T2D473K125AA
	3216	1.60 ± 0.20	± 10%	CGJ5L4X7T2H473K160AA	
68 nF	2012	1.25 ± 0.20	± 10%		CGJ4J3X7T2D683K125AA
	2012	1.25 ± 0.20	± 10%	CGJ4J3X7T2D104K125AA	
100 nF	3225	1.60 ± 0.20	± 10%	CGJ6L4X7T2H104K160AA	
	3216	1.30 ± 0.20	± 10%		CGJ5K9X7T2D154K130AA
150 nF	3225	2.00 ± 0.20	± 10%	CGJ6M4X7T2H154K200AA	
220 nF	3216	1.60 ± 0.20	± 10%		CGJ5L3X7T2D224K160AA
330 nF	3225	2.00 ± 0.20	± 10%		CGJ6M3X7T2D334K200AA

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