TDK

August 2016

MULTILAYER CERAMIC CHIP CAPACITORS

CGA Series
Automotive Grade
High Voltage (1000V and over)

Type:

CGA6 [EIA CC1210]
CGA7 [EIA CC1808]
CGA8 [EIA CC1812]
CGA9 [EIA CC2220]

REMINDERS

Please read before using this product

SAFETY REMINDERS

⚠ REMINDERS

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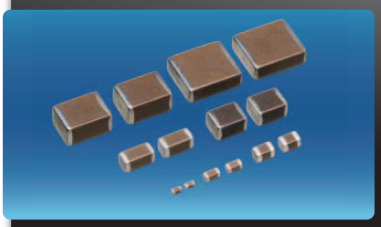
(Example)

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

TDK

Lead Free | RoHS COMPLIANT | Ecological



CGA Series

High Voltage (1000V and over)

Type: CGA6 [EIA CC1210], CGA7 [EIA CC1808], CGA8 [EIA CC1812], CGA9 [EIA CC2220]

Features

- Advanced design provides improved withstand voltage characteristics.
- TDK's proprietary intemal electrode structure and the use of low-dielectric-strength material result in highly reliable performance in high-voltage applications.
- Complies with ISO8802-3 for LAN applications.
- Designed exclusively for reflow soldering.
- AEC-Q200 compliant.

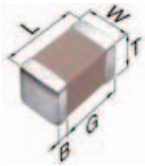
Applications

- Wireless Charging units, such as a DC-DC converter, a charger on board, etc for EV and PHEV.
- Snubber of a high voltage circuit, resonant circuit, time constant circuit and surge protection for EV and HEV.

Cautions

- A slit of about 1mm on the circuit board is recommended to improve removal of the flux after soldering.
- Ensure that this product is completely dried following washing.
- Because this product will be subjected to high voltages,use only low-activity rosin flux (with 0.2% max. of chlorine).
- Using this product with aluminum circuit boards must be considered a special implementation because the high heat stress levels are involved. In case of using aluminum circuit boards, please contact TDK.

Shape & Dimensions



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

Catalog Number Construction

CGA • 8 • M • 1 • X7R • 3A • 103 • K • 200 • K • A

Series Name

Dimensions L x W (mm)

Code	Length	Width	Terminal
6	3.20 ± 0.40	2.50 ± 0.30	0.20 min.
7	4.50 ± 0.40	2.00 ± 0.30	0.20 min.
8	4.50 ± 0.40	3.20 ± 0.40	0.20 min.
9	5.70 ± 0.40	5.00 ± 0.40	0.20 min.

Thickness T Code (mm)

Code	Thickness	Code	Thickness
F	0.85 mm	M	2.00 mm
G	1.10 mm	N	2.30 mm
K	1.30 mm	P	2.50 mm
L	1.60 mm	Q	2.80 mm

Voltage Condition for Life Test

Symbol	Condition
1	1 × 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

Rated Voltage (DC)

Code	Voltage (DC)
3A	1,000V
3D	2,000V
3F	3,000V

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.

Ex. 100=10pF; 101=100pF; 333=33,000pF

Capacitance Tolerance

Code	Tolerance
F	± 1pF
J	± 5%
K	± 10%
M	± 20%

Nominal Thickness

Code	Thickness	Code	Thickness	Code	Thickness
085	0.85 mm	160	1.60 mm	250	2.50 mm
110	1.10 mm	200	2.00 mm	280	2.80 mm
130	1.30 mm	230	2.30 mm		

Packaging Style

Code	Style
A	178 mm Reel, 4 mm Pitch
K	178 mm Reel, 8 mm Pitch

Special Reserved Code

Code	Description
A, C	TDK Internal Code

Capacitance Range Chart

CGA6(3225) [EIA CC1210]

Capacitance Range Chart

Temperature Characteristics: C0G (0±30ppm/℃)

Rated Voltage：1KV (3A)

Capacitance		Tolerance	C0G
(pF)	Code		3A (1KV)
1,000	102	J: ± 5%	
1,200	122		
1,500	152		
1,800	182		
2,200	222		
2,700	272		
3,300	332		
3,900	392		
4,700	472		
5,600	562		
6,800	682		
8,200	822		
10,000	103		
12,000	123		
15,000	153		
18,000	183		
22,000	223		

Standard Thickness

2.00 mm

2.30 mm

2.50 mm

Capacitance Range Chart

CGA7(4520) [EIA CC1808]

Capacitance Range Chart

Temperature Characteristics: C0G (0±30ppm/℃), X7R (±15%)

Rated Voltage：3000V (3F), 2000V (3D), 1000V (3A)

Capacitance		Tolerance	C0G	X7R	
(pF)	Code		3F (3KV)	3D (2KV)	3A (1KV)
10	100	F: ± 1pF			
12	120	K: ± 10%			
15	150				
18	180				
22	220				
27	270				
33	330				
39	390				
47	470				
56	560				
68	680				
82	820				
100	101				
470	471	K: ± 10%			
1,000	102	M: ± 20%			

Standard Thickness

0.85 mm

1.10 mm

1.30 mm

1.60 mm

2.00 mm

Capacitance Range Chart

CGA8(4532) [EIA CC1812]

Capacitance Range Chart

Temperature Characteristics: C0G (0±30ppm/℃), X7R (±15%)

Rated Voltage：3000V (3F), 2000V (3D), 1000V (3A)

Capacitance		Tolerance	C0G	X7R	
(pF)	Code		3F (3KV)	3D (2KV)	3A (1KV)
100	**101**	K: ± 10%			
120	**121**				
150	**151**				
180	**181**				
220	**221**				
270	**271**				
330	**331**				
2,200	**222**	K: ± 10%			
4,700	**472**	M: ± 20%			
10,000	**103**				

Standard Thickness

- 1.30 mm
- 1.60 mm
- 2.00 mm
- 2.30 mm
- 2.50 mm

Capacitance Range Chart

CGA9(5750) [EIA CC2220]

Capacitance Range Chart

Temperature Characteristics: C0G (0±30ppm/℃)

Rated Voltage：1KV (3A)

Capacitance		Tolerance	C0G
(pF)	Code		3A (1KV)
10,000	**103**	J: ± 5%	
12,000	**123**		
15,000	**153**		
18,000	**183**		
22,000	**223**		
27,000	**273**		
33,000	**333**		

Standard Thickness

- 2.80 mm

Capacitance Range Table

Class 1 (Temperature Compensating)

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

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number	
				Rated VoltageEdc：3KV	Rated VoltageEdc：1KV
10 pF	4520	0.85 ± 0.15	± 1pF	CGA7F1C0G3F100F085KA	
12 pF	4520	0.85 ± 0.15	± 10%	CGA7F1C0G3F120K085KA	
15 pF	4520	1.10 ± 0.20	± 10%	CGA7G1C0G3F150K110KA	
18 pF	4520	1.10 ± 0.20	± 10%	CGA7G1C0G3F180K110KA	
22 pF	4520	1.10 ± 0.20	± 10%	CGA7G1C0G3F220K110KA	
27 pF	4520	1.60 ± 0.20	± 10%	CGA7L1C0G3F270K160KA	
33 pF	4520	1.60 ± 0.20	± 10%	CGA7L1C0G3F330K160KA	
39 pF	4520	1.60 ± 0.20	± 10%	CGA7L1C0G3F390K160KA	
47 pF	4520	1.60 ± 0.20	± 10%	CGA7L1C0G3F470K160KA	
56 pF	4520	2.00 ± 0.20	± 10%	CGA7M1C0G3F560K200KA	
68 pF	4520	2.00 ± 0.20	± 10%	CGA7M1C0G3F680K200KA	
82 pF	4520	2.00 ± 0.20	± 10%	CGA7M1C0G3F820K200KA	
100 pF	4520	2.00 ± 0.20	± 10%	CGA7M1C0G3F101K200KA	
	4532	1.60 ± 0.20	± 10%	CGA8L1C0G3F101K160KA	
120 pF	4532	1.60 ± 0.20	± 10%	CGA8L1C0G3F121K160KA	
150 pF	4532	1.60 ± 0.20	± 10%	CGA8L1C0G3F151K160KA	
180 pF	4532	1.60 ± 0.20	± 10%	CGA8L1C0G3F181K160KA	
220 pF	4532	2.00 ± 0.20	± 10%	CGA8M1C0G3F221K200KA	
270 pF	4532	2.30 ± 0.20	± 10%	CGA8N1C0G3F271K230KA	
330 pF	4532	2.50 ± 0.30	± 10%	CGA8P1C0G3F331K250KA	
1 nF	3225	2.00 ± 0.20	± 5%		CGA6M1C0G3A102J200AC
1.2 nF	3225	2.00 ± 0.20	± 5%		CGA6M1C0G3A122J200AC
1.5 nF	3225	2.00 ± 0.20	± 5%		CGA6M1C0G3A152J200AC
1.8 nF	3225	2.00 ± 0.20	± 5%		CGA6M1C0G3A182J200AC
2.2 nF	3225	2.00 ± 0.20	± 5%		CGA6M1C0G3A222J200AC
2.7 nF	3225	2.00 ± 0.20	± 5%		CGA6M1C0G3A272J200AC
3.3 nF	3225	2.00 ± 0.20	± 5%		CGA6M1C0G3A332J200AC
3.9 nF	3225	2.00 ± 0.20	± 5%		CGA6M1C0G3A392J200AC
4.7 nF	3225	2.00 ± 0.20	± 5%		CGA6M1C0G3A472J200AC
5.6 nF	3225	2.00 ± 0.20	± 5%		CGA6M1C0G3A562J200AC
6.8 nF	3225	2.00 ± 0.20	± 5%		CGA6M1C0G3A682J200AC
8.2 nF	3225	2.30 ± 0.20	± 5%		CGA6N1C0G3A822J230AC
10 nF	3225	2.50 ± 0.30	± 5%		CGA6P1C0G3A103J250AC
	5750	2.80 ± 0.30	± 5%		CGA9Q1C0G3A103J280KC
12 nF	3225	2.50 ± 0.30	± 5%		CGA6P1C0G3A123J250AC
	5750	2.80 ± 0.30	± 5%		CGA9Q1C0G3A123J280KC
15 nF	3225	2.50 ± 0.30	± 5%		CGA6P1C0G3A153J250AC
	5750	2.80 ± 0.30	± 5%		CGA9Q1C0G3A153J280KC
18 nF	3225	2.50 ± 0.30	± 5%		CGA6P1C0G3A183J250AC
	5750	2.80 ± 0.30	± 5%		CGA9Q1C0G3A183J280KC
22 nF	3225	2.50 ± 0.30	± 5%		CGA6P1C0G3A223J250AC
	5750	2.80 ± 0.30	± 5%		CGA9Q1C0G3A223J280KC
27 nF	5750	2.80 ± 0.30	± 5%		CGA9Q1C0G3A273J280KC
33 nF	5750	2.80 ± 0.30	± 5%		CGA9Q1C0G3A333J280KC

Class 2 (Temperature Stable)

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

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number	
				Rated VoltageEdc：2KV	Rated VoltageEdc：1KV
470 pF	4520	1.30 ± 0.20	± 10%	CGA7K1X7R3D471K130KA	CGA7K1X7R3A471K130KA
			± 20%	CGA7K1X7R3D471M130KA	CGA7K1X7R3A471M130KA
1 nF	4520	1.30 ± 0.20	± 10%	CGA7K1X7R3D102K130KA	CGA7K1X7R3A102K130KA
			± 20%	CGA7K1X7R3D102M130KA	CGA7K1X7R3A102M130KA
2.2 nF	4532	1.30 ± 0.20	± 10%	CGA8K1X7R3D222K130KA	
			± 20%	CGA8K1X7R3D222M130KA	
4.7 nF	4532	1.60 ± 0.20	± 10%		CGA8L1X7R3A472K160KA
			± 20%		CGA8L1X7R3A472M160KA
10 nF	4532	2.00 ± 0.20	± 10%		CGA8M1X7R3A103K200KA
			± 20%		CGA8M1X7R3A103M200KA