

# MULTILAYER CERAMIC CHIP CAPACITORS

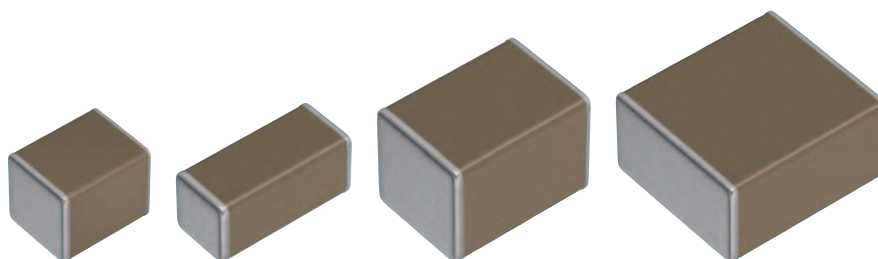
Automotive grade, high voltage (1,000V and over)

## CGA series

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CGA6	3225 [EIA 1210]
CGA7	4520 [EIA 1808]
CGA8	4532 [EIA 1812]
CGA9	5750 [EIA 2220]

\* Dimensions code: JIS[EIA]



## REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

### SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using this products.

#### REMINDERS

1. The products listed in this specification are intended for use in automotive applications under normal operation and usage conditions. The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality requires a more stringent level of safety or reliability, or whose failure, malfunction or defect could cause serious damage to society, person or property.

Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below or for any other use exceeding the range or conditions set forth in this specification sheet. If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in this specification, please contact us.

- |  |  |
|--|--|
| (1) Aerospace/aviation equipment   | (8) Public information-processing equipment                                  |
| (2) Transportation equipment (electric trains, ships, etc.)                          | (9) Military equipment   |
| (3) Medical equipment (excepting Pharmaceutical Affairs Law classification Class1,2) | (10) Electric heating apparatus, burning equipment                           |
| (4) Power-generation control equipment   | (11) Disaster prevention/crime prevention equipment                          |
| (5) Atomic energy-related equipment  | (12) Safety equipment  |
| (6) Seabed equipment   | (13) Other applications that are not considered general-purpose applications |
| (7) Transportation control equipment   |  |

When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.

In addition, although the products listed in this specification are intended for use in automotive applications as described above, they are not prohibited to use in general electronic equipment, whose performance and/or quality doesn't require a more stringent level of safety or reliability, or whose failure, malfunction or defect could not cause serious damage to society, person or property. Therefore, the description of this caution will be applied, when the products are used in general electronic equipment under a normal operation and usage conditions.

- We may modify products or discontinue production of a product listed in this catalog without prior notification.
- We provide "Delivery Specification" that explain precautions for the specifications and safety of each product listed in this catalog. We strongly recommend that you exchange these delivery specifications with customers that use one of these products.
- If you plan to export a product listed in this catalog, keep in mind that it may be a restricted item according to the "Foreign Exchange and Foreign Trade Control Law". In such cases, it is necessary to acquire export permission in harmony with this law.
- Any reproduction or transferring of the contents of this catalog is prohibited without prior permission from our company.
- We are not responsible for problems that occur related to the intellectual property rights or other rights of our company or a third party when you use a product listed in this catalog. We do not grant license of these rights.
- This catalog only applies to products purchased through our company or one of our company's official agencies. This catalog does not apply to products that are purchased through other third parties.

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

# CGA series

## High voltage (1,000V and over)



Type: CGA6/3225 [EIA 1210], CGA7/4520 [EIA 1808], CGA8/4532 [EIA 1812],  
CGA9/5750 [EIA 2220]

### SERIES OVERVIEW

High voltage CGA series, automotive grade of TDK's multilayer ceramic chip capacitor, is a product having a high withstanding voltage characteristic. The lineup is voltage rating of 1,000V to 3,000V with capacitance range up to 33nF.

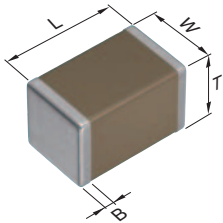
### FEATURES

- Voltage rating of 1,000V, 2,000V and 3,000V
- Operating temperature range: -55 to +125°C
- COG type having excellent stable temperature and DC-bias characteristics is also available
- AEC-Q200 compliant

### APPLICATIONS

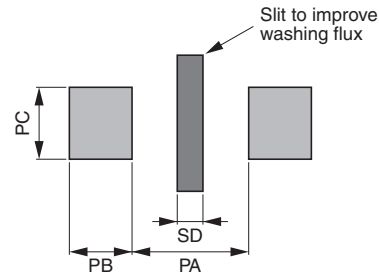
- Decoupling, snubber and resonant circuits of high voltage circuits
- Wireless charging units, DC-DC converter, Inverter

### SHAPE & DIMENSIONS



L	Body length
W	Body width
T	Body height
B	Terminal width

### RECOMMENDED CONDITIONS



- It is recommended to provide a slit (about 1mm width) in the board under the components to improve washing flux.
- Please make sure to dry detergent up completely before.
- It is recommended to use low activated flux (Chlorine content: less than 0.1wt%) such rosin due to high voltage usage.
- When mounting on an aluminum substrate, it is more likely to be affected by heat stress from the substrate. Please inquire separate specification when mounted on the substrate.

Dimensions in mm				
Type	L	W	T	B
CGA6	3.20±0.40	2.50±0.30	2.50±0.30	0.20 min.
CGA7	4.50±0.40	2.00±0.20	2.00±0.20	0.20 min.
CGA8	4.50±0.40	3.20±0.40	2.50±0.30	0.20 min.
CGA9	5.70±0.40	5.00±0.40	2.80±0.30	0.20 min.

\*Dimensional tolerances are typical values.

**CATALOG NUMBER CONSTRUCTION**

<b>CGA</b>	<b>9</b>	<b>Q</b>	<b>1</b>	<b>C0G</b>	<b>3A</b>	<b>333</b>	<b>J</b>	<b>280</b>	<b>K</b>	<b>C</b>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

## (1) Series

## (2) Dimensions L x W (mm)

Code	EIA	Length	Width	Terminal width
6	1210	3.20	2.50	0.20 min.
7	1808	4.50	2.00	0.20 min.
8	1812	4.50	3.20	0.20 min.
9	2220	5.70	5.00	0.20 min.

## (3) Thickness code

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

## (4) Voltage condition for life test

Symbol	Condition
1	1 × R.V.

## (5) 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

## (6) Rated voltage (DC)

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

## (7) 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.

(Example)0R5 = 0.5pF

101 = 100pF

225 = 2,200,000pF = 2.2μF

## (8) Capacitance tolerance

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

## (9) Thickness

Code	Thickness
085	0.85 mm
110	1.10 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

## (10) Packaging style

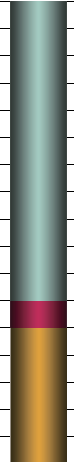
Code	Style
A	178mm reel, 4mm pitch
K	178mm reel, 8mm pitch




## (11) Special reserved code

Code	Description
A,C	TDK internal code

## Capacitance range chart

CGA6/3225 [EIA 1210]

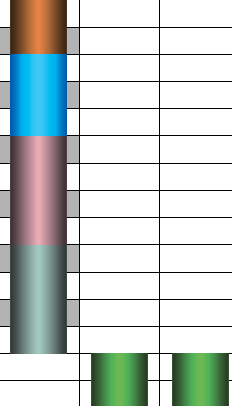




Capacitance		COG 3A (1kV)
(pF)	Code	
1,000	102	
1,200	122	
1,500	152	
1,800	182	
2,200	222	
2,700	272	
3,300	332	
3,900	392	
4,700	472	
5,600	562	
6,800	682	
8,200	822	
10,000	103	
12,000	123	
15,000	153	
18,000	183	
22,000	223	


Standard thickness  2.00 mm  2.30 mm  2.50 mm

■ For details such as the catalog numbers, please refer to the capacitance range table on page 7.

## Capacitance range chart

CGA7/4520 [EIA 1808]

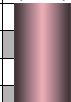



Capacitance		COG		X7R	
(pF)	Code	3F (3kV)	3D (2kV)	3A (1kV)	
10	100				
12	120				
15	150				
18	180				
22	220				
27	270				
33	330				
39	390				
47	470				
56	560				
68	680				
82	820				
100	101				
470	471				
1,000	102				






Standard thickness  0.85 mm  1.10 mm  1.30 mm  1.60 mm  2.00 mm Background gray: These products are not recommended for new designs.


■ For details such as the catalog numbers, please refer to the capacitance range table on page 7.

## Capacitance range chart

**CGA8/4532 [EIA 1812]**

Capacitance		C0G	X7R		
(pF)	Code		3F (3kV)	3D (2kV)	3A (1kV)
100	101				
120	121				
150	151				
180	181				
220	221				
270	271				
330	331				
2,200	222				
4,700	472				
10,000	103				

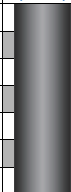
Standard thickness  1.30 mm  1.60 mm  2.00 mm  2.30 mm  2.50 mm


 Background gray: These products are not recommended for new designs.

■ For details such as the catalog numbers, please refer to the capacitance range table on page 7.

## Capacitance range chart

**CGA9/5750 [EIA 2220]**

Capacitance		C0G
(pF)	Code	
10,000	103	
12,000	123	
15,000	153	
18,000	183	
22,000	223	
27,000	273	
33,000	333	

Standard thickness  2.80 mm

 Background gray: These products are not recommended for new designs.

■ For details such as the catalog numbers, please refer to the capacitance range table on page 7.

## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

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

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

■ Gray items: These products are not recommended for new designs.  
Click the part numbers for details.

## Capacitance range table

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

Capacitance	Dimensions	Thickness (mm)	Capacitance tolerance	Catalog number	
				Rated voltage Edc: 2kV	Rated voltage Edc: 1kV
470pF	4520	1.30±0.20	±10%	CGA7K1X7R3D471K130KA	CGA7K1X7R3A471K130KA
			±20%	CGA7K1X7R3D471M130KA	CGA7K1X7R3A471M130KA
1nF	4520	1.30±0.20	±10%	CGA7K1X7R3D102K130KA	CGA7K1X7R3A102K130KA
			±20%	CGA7K1X7R3D102M130KA	CGA7K1X7R3A102M130KA
2.2nF	4532	1.30±0.20	±10%	CGA8K1X7R3D222K130KA	
			±20%	CGA8K1X7R3D222M130KA	
4.7nF	4532	1.60±0.20	±10%		CGA8L1X7R3A472K160KA
			±20%		CGA8L1X7R3A472M160KA
10nF	4532	2.00±0.20	±10%		CGA8M1X7R3A103K200KA
			±20%		CGA8M1X7R3A103M200KA

■ Gray items: These products are not recommended for new designs.  
Click the part numbers for details.

⚠ 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.

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