THE DATASHEET OF

CGA7K1X7R3D471M130KA

TDK

August 2024

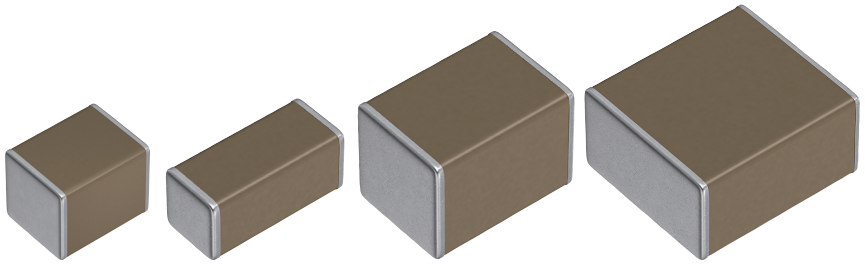
MULTILAYER CERAMIC CHIP CAPACITORS

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

CGA series

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

   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.
2. We may modify products or discontinue production of a product listed in this catalog without prior notification.
3. 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.
4. 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.
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7. 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.

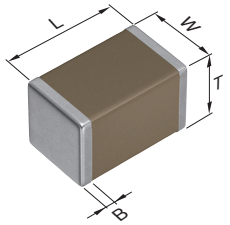
FEATURES

- Voltage rating: 1,000V, 1,250V, 2,000V, 3,000V
- Operating temperature range: -55～+125℃
- C0G type having excellent stable temperature and DC-bias characteristics is also available
- Qualified based on AEC-Q200

APPLICATION

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

SHAPE & DIMENSIONS



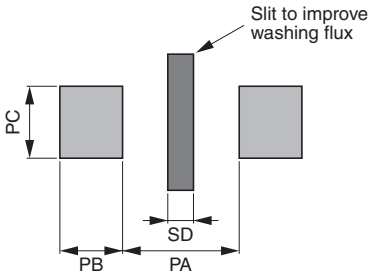
L	Body length
W	Body width
T	Body height
B	Terminal width

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.

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.

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CATALOG NUMBER CONSTRUCTION

CGA	6	P	1	C0G	3B	103	G	250	A	C
(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 x 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
3B	1,250V
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
G	±2%
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

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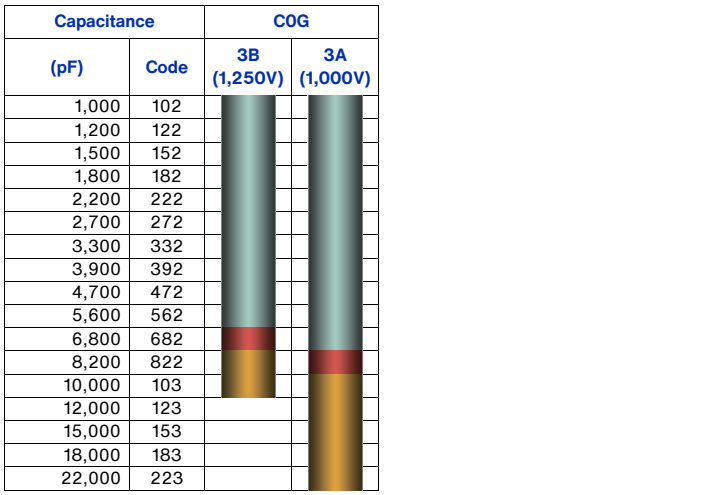
Capacitance range chart — CGA6/3225 [EIA 1210]

Capacitance		C0G	
(pF)	Code	3B (1,250V)	3A (1,000V)
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		



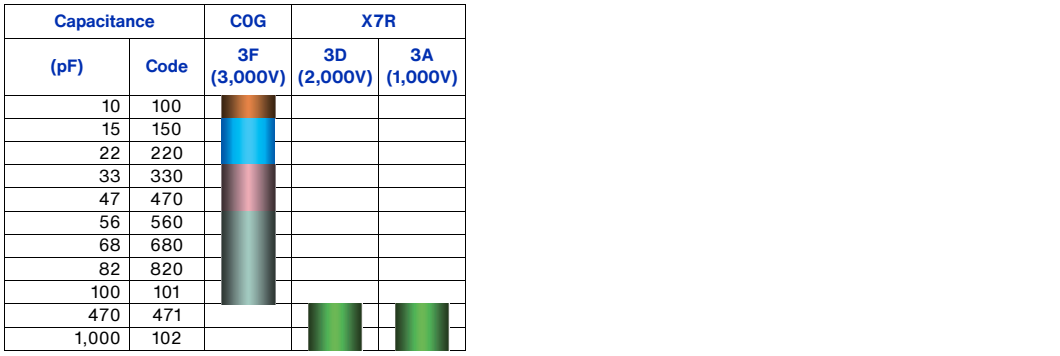
Standard thickness 2.00 mm 2.30 mm 2.50 mm

■Click the charts for details.

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

Capacitance range chart — CGA7/4520 [EIA 1808]

Capacitance		C0G	X7R	
(pF)	Code	3F (3,000V)	3D (2,000V)	3A (1,000V)
10	100			
15	150			
22	220			
33	330			
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

■Click the charts for details.

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

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Capacitance range chart — CGA8/4532 [EIA 1812]

Capacitance		C0G	X7R	
(pF)	Code	3F (3,000V)	3D (2,000V)	3A (1,000V)
100	101			
150	151			
220	221			
330	331			
2,200	222			
4,700	472			
10,000	103			

Standard thickness 1.30 mm 1.60 mm 2.00 mm 2.50 mm

■Click the charts for details.

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

Capacitance range chart — CGA9/5750 [EIA 2220]

Capacitance		C0G
(pF)	Code	3A (1,000V)
10,000	103	
15,000	153	
22,000	223	
33,000	333	

Standard thickness 2.80 mm

■Click the charts for details.

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

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Capacitance range table — Temperature characteristics: C0G (-55 to +125°C, 0±30ppm/°C)

Capacitance	Width (mm)	Thickness (mm)	Capacitance tolerance	Catalog number		
				Rated voltage Edc: 3,000V	Rated voltage Edc: 1,250V	Rated voltage Edc: 1,000V
10pF	4520	0.85±0.15	±1pF	CGA7F1C0G3F100F085KA		
15pF	4520	1.10±0.20	±10%	CGA7G1C0G3F150K110KA		
22pF	4520	1.10±0.20	±10%	CGA7G1C0G3F220K110KA		
33pF	4520	1.60±0.20	±10%	CGA7L1C0G3F330K160KA		
47pF	4520	1.60±0.20	±10%	CGA7L1C0G3F470K160KA		
68pF	4520	2.00±0.20	±10%	CGA7M1C0G3F680K200KA		
100pF	4520	2.00±0.20	±10%	CGA7M1C0G3F101K200KA		
	4532	1.60±0.20	±10%	CGA8L1C0G3F101K160KA		
150pF	4532	1.60±0.20	±10%	CGA8L1C0G3F151K160KA		
220pF	4532	2.00±0.20	±10%	CGA8M1C0G3F221K200KA		
330pF	4532	2.50±0.30	±10%	CGA8P1C0G3F331K250KA		
1nF	3225	2.00±0.20	±2%		CGA6M1C0G3B102G200AC	CGA6M1C0G3A102G200AC
			±5%		CGA6M1C0G3B102J200AC	CGA6M1C0G3A102J200AC
1.2nF	3225	2.00±0.20	±2%		CGA6M1C0G3B122G200AC	CGA6M1C0G3A122G200AC
			±5%		CGA6M1C0G3B122J200AC	CGA6M1C0G3A122J200AC
1.5nF	3225	2.00±0.20	±2%		CGA6M1C0G3B152G200AC	CGA6M1C0G3A152G200AC
			±5%		CGA6M1C0G3B152J200AC	CGA6M1C0G3A152J200AC
1.8nF	3225	2.00±0.20	±2%		CGA6M1C0G3B182G200AC	CGA6M1C0G3A182G200AC
			±5%		CGA6M1C0G3B182J200AC	CGA6M1C0G3A182J200AC
2.2nF	3225	2.00±0.20	±2%		CGA6M1C0G3B222G200AC	CGA6M1C0G3A222G200AC
			±5%		CGA6M1C0G3B222J200AC	CGA6M1C0G3A222J200AC
2.7nF	3225	2.00±0.20	±2%		CGA6M1C0G3B272G200AC	CGA6M1C0G3A272G200AC
			±5%		CGA6M1C0G3B272J200AC	CGA6M1C0G3A272J200AC
3.3nF	3225	2.00±0.20	±2%		CGA6M1C0G3B332G200AC	CGA6M1C0G3A332G200AC
			±5%		CGA6M1C0G3B332J200AC	CGA6M1C0G3A332J200AC
3.9nF	3225	2.00±0.20	±2%		CGA6M1C0G3B392G200AC	CGA6M1C0G3A392G200AC
			±5%		CGA6M1C0G3B392J200AC	CGA6M1C0G3A392J200AC
4.7nF	3225	2.00±0.20	±2%		CGA6M1C0G3B472G200AC	CGA6M1C0G3A472G200AC
			±5%		CGA6M1C0G3B472J200AC	CGA6M1C0G3A472J200AC
5.6nF	3225	2.00±0.20	±2%		CGA6M1C0G3B562G200AC	CGA6M1C0G3A562G200AC
			±5%		CGA6M1C0G3B562J200AC	CGA6M1C0G3A562J200AC
6.8nF	3225	2.00±0.20	±2%		CGA6N1C0G3B682G230AC	CGA6M1C0G3A682G200AC
			±5%		CGA6N1C0G3B682J230AC	CGA6M1C0G3A682J200AC
8.2nF	3225	2.30±0.20	±2%		CGA6P1C0G3B822G250AC	CGA6N1C0G3A822G230AC
			±5%		CGA6P1C0G3B822J250AC	CGA6N1C0G3A822J230AC
10nF	3225	2.50±0.30	±2%		CGA6P1C0G3B103G250AC	CGA6P1C0G3A103G250AC
			±5%		CGA6P1C0G3B103J250AC	CGA6P1C0G3A103J250AC
	5750	2.80±0.30	±5%			CGA9Q1C0G3A103J280KC
12nF	3225	2.50±0.30	±2%			CGA6P1C0G3A123G250AC
			±5%			CGA6P1C0G3A123J250AC
15nF	3225	2.50±0.30	±2%			CGA6P1C0G3A153G250AC
			±5%			CGA6P1C0G3A153J250AC
	5750	2.80±0.30	±5%			CGA9Q1C0G3A153J280KC
18nF	3225	2.50±0.30	±2%			CGA6P1C0G3A183G250AC
			±5%			CGA6P1C0G3A183J250AC
22nF	3225	2.50±0.30	±2%			CGA6P1C0G3A223G250AC
			±5%			CGA6P1C0G3A223J250AC
	5750	2.80±0.30	±5%			CGA9Q1C0G3A223J280KC
33nF	5750	2.80±0.30	±5%			CGA9Q1C0G3A333J280KC

Click the part numbers for details.

Capacitance range table — Temperature characteristics: X7R (-55 to +125°C, ±15%)

Capacitance	Dimensions	Thickness (mm)	Capacitance tolerance	Catalog number	
				Rated voltage Edc: 2,000V	Rated voltage Edc: 1,000V
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

Click the part numbers for details.

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