



MULTILAYER CERAMIC CHIP CAPACITORS

Automotive grade, low ESL reverse geometry

CGA series

CGAE

0510 [0204 inch]

* 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

Low ESL reverse geometry

Type: CGAE/0510 [0204 inch]



SERIES OVERVIEW

Low ESL reverse geometry CGA series, automotive grade of TDK's multilayer ceramic chip capacitor, is a product whose electrodes rotated 90 degrees compared to general type. The structure makes the current route wider and shorter, therefore ESR/ESL and impedance are reduced.

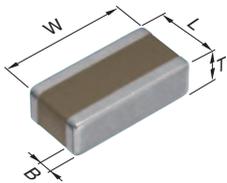
FEATURES

- Reduction in ESR/ESL and impedance due to the reverse geometry structure
- Superior attenuation characteristic in wide bandwidth
- Contributes to reduction in the number of decoupling MLCCs
- AEC-Q200 compliant

APPLICATION

- EMC countermeasure and decoupling use in power lines for automotive applications such as ADAS, autonomous driving system ECU, etc.

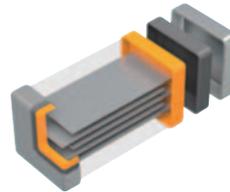
SHAPE & DIMENSIONS



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

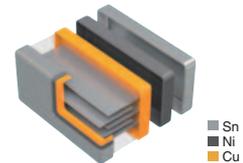
PRODUCT STRUCTURES

General type



The structure which multiple sheets of dielectric and conductive material are stacked alternately

Reverse geometry type



The current route becomes wider and shorter due to the reverse geometry structure which the electrode direction rotated 90 degrees compared to general type.

Dimensions in mm

Type	L	W	T	B
CGAEA	0.52±0.05	1.00±0.05	0.30±0.05	0.10 min.
CGAEB	0.58±0.10	1.10±0.10	0.58±0.10	0.10 min.
CGAEW	0.50±0.10	1.00±0.10	0.20±0.05	0.10 min.

*Dimensional tolerances are typical values.

CATALOG NUMBER CONSTRUCTION

CGA	E	B	1	X7T	0G	105	M	050	B	C
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

(1) Series

(2) Dimensions L x W (mm)

Dimensions code	EIA	Length	Width	Terminal width
E	CC0204	0.50	1.00	0.10

(3) Thickness code

Code	Thickness
A	0.30mm
B	0.50mm
W	0.20mm

(4) Voltage condition for life test

Symbol	Condition
1	1 x R.V.
2	2 x R.V.
3	1.5 x R.V.

(5) Temperature characteristics

Temperature characteristics	Capacitance change	Temperature range
X7R	±15%	-55 to +125°C
X7T	+22, -33%	-55 to +125°C

(6) Rated voltage (DC)

Code	Voltage (DC)
1H	50V
1E	25V
0J	6.3V
0G	4V

(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
M	±20%

(9) Thickness

Code	Thickness
020	0.20mm
030	0.30mm
050	0.50mm

(10) Packaging style

Code	Style
B	178mm reel, 2mm pitch

(11) Special reserved code

Code	Description
A, B, C	TDK internal code

Capacitance range chart

CGAE/0510 [0204 inch]

Capacitance		X7R		X7T	
(pF)	Code	1H (50V)	1E (25V)	0J (6.3V)	0G (4V)
47,000	473				
100,000	104				
1,000,000	105				

Standard thickness  0.20mm  0.30mm  0.50mm

■ Refer to the capacitance range table below for product thickness and capacitance tolerance.

Capacitance range table

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

Capacitance	Dimensions	Thickness (mm)	Capacitance tolerance	Catalog number	
				Rated voltage Edc: 50V	Rated voltage Edc: 25V
47nF	0510	0.30±0.05	±20%	CGAEA1X7R1H473M030BC	CGAEA2X7R1E473M030BA

Click the part number for details.

Capacitance range table

Temperature characteristic: X7T (–55 to +125°C, +22, –33%)

Capacitance	Dimensions	Thickness (mm)	Capacitance tolerance	Catalog number	
				Rated voltage Edc: 6.3V	Rated voltage Edc: 4V
100nF	0510	0.20±0.05	±20%		CGAEW1X7T0G104M020BC
		0.30±0.05	±20%	CGAEA1X7T0J104M030BC	CGAEA3X7T0G104M030BB
1µF	0510	0.58±0.10	±20%		CGAEB1X7T0G105M050BC

Click the part number for details.