

# Multilayer Ceramic Chip Capacitors

For automobile(Guaranteed at high temperature[150°C max.] )

## CGA series

Type:           CGA2(C1005[EIA CC0402])  
                  CGA3(C1608[EIA CC0603])  
                  CGA4(C2012[EIA CC0805])  
                  CGA5(C3216[EIA CC1206])  
                  CGA6(C3225[EIA CC1210])

Issue date:     August 2011

- All specifications are subject to change without notice.
  - Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.
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# REMINDERS

Please read this before using the product.

## SAFETY REMINDERS

### REMINDERS

1. If you intend to use a product listed in this catalog for a purpose that may cause loss of life or other damage, you must contact our company's sales window.
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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8. The descriptions in this catalog apply as of August, 2011.

# Multilayer Ceramic Chip Capacitors

## For Automobile(Guaranteed at High Temperature[150°C max.])

Conformity to RoHS Directive

### CGA Series

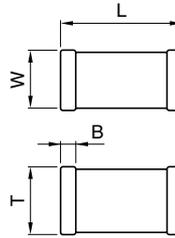
#### FEATURES

- Stable at a maximum operating temperature of 150°C, with a capacitance change within  $\pm 15\%$ .
- With a capacitance change within  $\pm 15\%$  at 125°C, the series is suited for devices that operate in high-temperature environments.

#### APPLICATION EXAMPLES

- Electric products used in severe temperature environments, such as ECUs, ABSs or HIDs

#### SHAPES AND DIMENSIONS



#### DIMENSIONS

The dimensions of each product are described within the product name.

##### Dimensions L×W

The fourth digit number in the product name corresponds to the dimensions of L×W.

Refer to the table below for specific values.

Dimension code	Dimensions in mm		
	L	W	B
2	1.0±0.05	0.5±0.05	0.1min.
3	1.6±0.1	0.8±0.1	0.2min.
4	2.0±0.2	1.25±0.2	0.2min.
5	3.2±0.2	1.6±0.2	0.2min.
6	3.2±0.4	2.5±0.3	0.2min.

- Dimension tolerances are typical values.

##### Product's Thickness T

The value in parentheses at the end of the product name corresponds to thickness T.

Refer to the table of "CAPACITANCE RANGES" for specific values.

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## PRODUCT IDENTIFICATION

CGA 2 B 2 X8R 1H 151 K ( 050 B A )  
 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)

### (1) Series name

### (2) Dimensions L×W

2	1.0×0.5mm
3	1.6×0.8mm
4	2.0×1.25mm
5	3.2×1.6mm
6	3.2×2.5mm

### (3) Dimensions T

B	0.50mm
E	0.80mm
F	0.85mm
H	1.15mm
J	1.25mm
L	1.60mm
M	2.00mm
P	2.50mm

- Overlaps with (9).

### (4) Test voltage of the high temperature load test (guaranteed voltage)

1	1× the rated voltage
2	2× the rated voltage
3	1.5× the rated voltage
4	1.2× the rated voltage
5	1.1× the rated voltage

### (5) Capacitance temperature characteristics

#### Class 2 (Temperature stable and general purpose)

Temperature characteristics	Capacitance change	Temperature range
X8R	±15%	-55 to +150°C

### (6) Rated voltage Edc

1C	16V
1E	25V
1V	35V
1H	50V
2A	100V
2E	250V
2W	450V
2J	630V

### (7) Nominal capacitance

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.

010	1pF
100	10pF
471	470pF
102	1,000pF
333	33,000pF
474	470,000pF
225	2,200,000pF (2.2μF)

### (8) Capacitance tolerance

Symbol	Tolerance	Applicable capacitance range
K	±10%	Over 10pF

### (9) Dimensions T

Expressed by a three-digit number in mm units.

The second and third digits denote the first and second decimal places, respectively.

030	0.30mm
050	0.50mm
085	0.85mm
125	1.25mm

- Overlaps with (3).

### (10) Packaging style

A	ø178mm reel with 4mm-pitch
B	ø178mm reel with 2mm-pitch
C	ø178mm reel with 1mm-pitch
D	ø330mm reel with 4mm-pitch
E	ø330mm reel with 2mm-pitch
F	ø330mm reel with 1mm-pitch
H	Bulk(bag)
J	ø330mm reel with 8mm-pitch
K	ø178mm reel with 8mm-pitch

### (11) TDK internal code

In brochures issued in August, 2011 and later, the product thickness and packing specifications are described at the end of the ordering name [the product name described in brochures] in parentheses.

Since the existing ordering name could not clearly express the product thickness and packing specifications, it has been changed to a new product description method that solves this inconvenience.

Please be aware that the last five digits of the ordering name on the delivery label and those in the brochure differ.

No changes have been made to the delivery name.

(Example)

Brochure issued date	Ordering name (description in the brochure)	Delivery name (description on the delivery label)
Prior to July, 2011	C1608X5R1C105K	C1608X5R1C105KT000N
August, 2011 or later	C1608X5R1C105K(080AA)	C1608X5R1C105KT000N

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## CAPACITANCE RANGES: CLASS 2

### TEMPERATURE CHARACTERISTICS: X8R(±15%)

Capacitance	Dimension L×W	Thickness T(mm)	Capacitance tolerance	Part No.			
				Rated voltage Edc: 630V	Rated voltage Edc: 450V	Rated voltage Edc: 250V	Rated voltage Edc: 100V
1nF	1608	0.80±0.10	±10%				CGA3E2X8R2A102K(080AA)
1.5nF	1608	0.80±0.10	±10%				CGA3E2X8R2A152K(080AA)
2.2nF	1608	0.80±0.10	±10%				CGA3E2X8R2A222K(080AA)
3.3nF	1608	0.80±0.10	±10%				CGA3E2X8R2A332K(080AA)
4.7nF	1608	0.80±0.10	±10%				CGA3E2X8R2A472K(080AA)
6.8nF	1608	0.80±0.10	±10%				CGA3E2X8R2A682K(080AA)
10nF	1608	0.80±0.10	±10%				CGA3E2X8R2A103K(080AA)
15nF	1608	0.80±0.10	±10%				CGA3E2X8R2A153K(080AA)
22nF	2012	1.25±0.20	±10%				CGA4J2X8R2A223K(125AA)
33nF	3216	0.85±0.15	±10%				CGA5F2X8R2A333K(085AA)
47nF	3216	0.85±0.15	±10%				CGA5F2X8R2A473K(085AA)
68nF	3216	1.15±0.15	±10%				CGA5H2X8R2A683K(115AA)
100nF	3216	1.15±0.15	±10%				CGA5H2X8R2A104K(115AA)
150nF	3216	1.60±0.20	±10%				CGA5L2X8R2A154K(160AA)

### TEMPERATURE CHARACTERISTICS: X8R(±15%)

Capacitance	Dimension L×W	Thickness T(mm)	Capacitance tolerance	Part No.			
				Rated voltage Edc: 50V	Rated voltage Edc: 35V	Rated voltage Edc: 25V	Rated voltage Edc: 16V
150pF	1005	0.50±0.05	±10%	CGA2B2X8R1H151K(050BA)			
220pF	1005	0.50±0.05	±10%	CGA2B2X8R1H221K(050BA)			
330pF	1005	0.50±0.05	±10%	CGA2B2X8R1H331K(050BA)			
470pF	1005	0.50±0.05	±10%	CGA2B2X8R1H471K(050BA)			
680pF	1005	0.50±0.05	±10%	CGA2B2X8R1H681K(050BA)			
1nF	1005	0.50±0.05	±10%	CGA2B2X8R1H102K(050BA)			
	1608	0.80±0.10	±10%	CGA3E2X8R1H102K(080AA)			
1.5nF	1005	0.50±0.05	±10%	CGA2B2X8R1H152K(050BA)			
	1608	0.80±0.10	±10%	CGA3E2X8R1H152K(080AA)			
2.2nF	1005	0.50±0.05	±10%	CGA2B2X8R1H222K(050BA)			
	1608	0.80±0.10	±10%	CGA3E2X8R1H222K(080AA)			
3.3nF	1005	0.50±0.05	±10%	CGA2B2X8R1H332K(050BA)			
	1608	0.80±0.10	±10%	CGA3E2X8R1H332K(080AA)			
4.7nF	1005	0.50±0.05	±10%	CGA2B2X8R1H472K(050BA)			
	1608	0.80±0.10	±10%	CGA3E2X8R1H472K(080AA)			
6.8nF	1005	0.50±0.05	±10%			CGA2B2X8R1E682K(050BA)	
	1608	0.80±0.10	±10%	CGA3E2X8R1H682K(080AA)			
10nF	1005	0.50±0.05	±10%			CGA2B2X8R1E103K(050BA)	
	1608	0.80±0.10	±10%	CGA3E2X8R1H103K(080AA)			
15nF	1608	0.80±0.10	±10%	CGA3E2X8R1H153K(080AA)			
22nF	1608	0.80±0.10	±10%	CGA3E2X8R1H223K(080AA)			
33nF	1608	0.80±0.10	±10%	CGA3E2X8R1H333K(080AA)			
47nF	1608	0.80±0.10	±10%	CGA3E2X8R1H473K(080AA)			
68nF	1608	0.80±0.10	±10%			CGA3E2X8R1E683K(080AA)	
	2012	1.25±0.20	±10%	CGA4J2X8R1H683K(125AA)			
100nF	1608	0.80±0.10	±10%			CGA3E2X8R1E104K(080AA)	
	2012	1.25±0.20	±10%	CGA4J2X8R1H104K(125AA)			
150nF	2012	0.85±0.15	±10%			CGA4F2X8R1E154K(085AA)	
	3216	0.85±0.15	±10%	CGA5F2X8R1H154K(085AA)			
220nF	2012	1.25±0.20	±10%			CGA4J2X8R1E224K(125AA)	
	3216	1.15±0.15	±10%	CGA5H2X8R1H224K(115AA)			
330nF	2012	1.25±0.20	±10%			CGA4J2X8R1E334K(125AA)	
	3216	0.85±0.15	±10%			CGA5F2X8R1E334K(085AA)	
470nF	3216	1.60±0.20	±10%	CGA5L2X8R1H334K(160AA)			
	3216	0.85±0.15	±10%			CGA5F2X8R1E474K(085AA)	
680nF	3216	1.60±0.20	±10%	CGA5L2X8R1H474K(160AA)			
	3216	0.85±0.15	±10%			CGA5H2X8R1E684K(115AA)	
1µF	3216	1.60±0.20	±10%			CGA5L2X8R1E105K(160AA)	
1.5µF	3225	1.60±0.20	±10%			CGA6L2X8R1E155K(160AA)	
2.2µF	3225	2.00±0.20	±10%			CGA6M2X8R1E225K(200AA)	
3.3µF	3225	2.50±0.30	±10%			CGA6P2X8R1E335K(250AA)	

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