



# MULTILAYER CERAMIC CHIP CAPACITORS

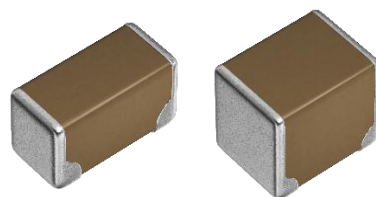
Automotive grade, soft termination (Low resistance type)

## CNA series

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CNA5      3216 [CC1206]  
CNA6      3225 [CC1210]

\* 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



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.

# CNA series



## Soft termination (Low resistance type)

Type: CNA5: 3216 (CC1206), CNA6: 3225 (CC1210)

### SERIES OVERVIEW

CNA series is a product incorporating conductive resin layers into the terminal electrodes. Because the resin layers relieve mechanical stress caused by board flexure, the ceramic body is protected from cracks. In addition, unlike conventional soft termination CGA series whose whole terminal electrodes are covered with the resin layers, the resin layers are covering only a board mounting side. This structure allows electric current to pass outside the resin layers, and so electrical resistance has been reduced. CNA series is a TDK's original product.

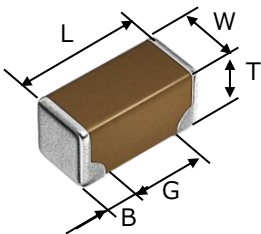
### FEATURES

- Achieves both high reliability and low resistance by the original structure
- Relieves mechanical stress caused by board flexure
- Qualified based on AEC-Q200

### APPLICATIONS

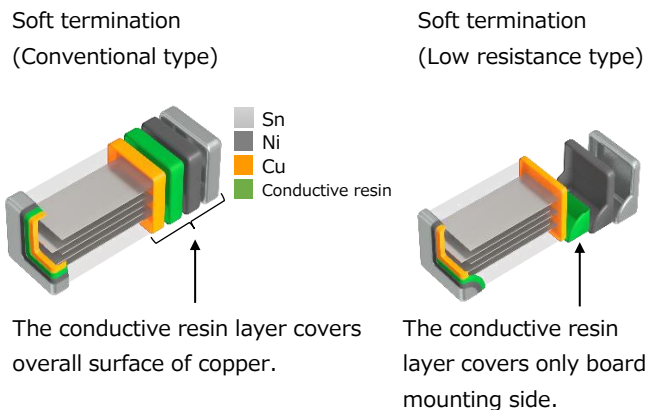
- Fail-safe design in battery line
- Prevention of ceramic body cracks by board bending

### SHAPE & DIMENSIONS



L: Product length  
 W: Product width  
 T: Product thickness  
 B: Terminal width  
 G: Terminal spacing

### ELECTRODE STRUCTURE DRAWING



Type	Dimensions in mm				
	L	W	T	B	G
CNA5	3.20±0.30,-0.20	1.60±0.30,-0.20	1.60±0.30,-0.20	0.30 min.	1.00 min.
CNA6	3.20±0.30	2.50±0.30	2.50±0.30	0.50 min.	---

Dimensional tolerances are typical values. Please check the actual values on the product page of the website.



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## ■ CATALOG NUMBER CONSTRUCTION

<b>CNA</b>	<b>6</b>	<b>P</b>	<b>1</b>	<b>X7S</b>	<b>1A</b>	<b>476</b>	<b>M</b>	<b>250</b>	<b>A</b>	<b>E</b>
(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
5	CC1206	3.20	1.60	0.30
6	CC1210	3.20	2.50	0.50

### (3) Thickness code

Code	Thickness
L	1.60 mm
P	2.50 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
NP0	0±30 ppm/°C	-55 to +150 °C
X7R	±15 %	-55 to +125 °C
X7S	±22 %	-55 to +125 °C

### (6) Rated voltage (DC)

Code	Voltage (DC)
2A	100 V
1N	75 V
1H	50 V
1E	25 V
1C	16 V
1A	10 V

### (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 = 0.5 pF  
101 = 100 pF  
225 = 2,200,000 pF = 2.2 μF

### (8) Capacitance tolerance

Code	Tolerance
K	±10 %
M	±20 %

### (9) Thickness

Code	Thickness
160	1.60 mm
250	2.50 mm

### (10) Packaging style

Code	Style
A	178 mm reel, 4 mm pitch

### (11) Special reserved code

Code	Description
E	Soft termination



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## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range chart

CNA5: 3216 (CC1206)

Capacitance		X7R				X7S
(pF)	Code	1N (75 V)	1H (50 V)	1E (25 V)	1C (16 V)	1A (10 V)
2,200,000	225					
4,700,000	475					
10,000,000	106					
22,000,000	226					

Standard thickness 1.60 mm

- Click the charts for details.

- For details such as the catalog numbers and product size, please refer to the capacitance range table on P-6.

## Capacitance range chart

CNA6: 3225 (CC1210)

Capacitance		NP0	COG			X7R			X7S
(pF)	Code	2J (630 V)	3B (1,250 V)	3A (1,000 V)	2J (630 V)	2A (100 V)	1H (50 V)	1E (25 V)	1A (10 V)
8,200	822								
10,000	103								
12,000	123								
15,000	153								
18,000	183								
22,000	223								
33,000	333								
4,700,000	475								
10,000,000	106								
22,000,000	226								
47,000,000	476								

Standard thickness 2.50 mm

- Click the charts for details.

- For details such as the catalog numbers and product size, please refer to the capacitance range table on P-6.



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# MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

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

Capacitance	Dimensions	Thickness (mm)	Cap tol	Catalog numbers		
				Rated voltage Edc:1,250 V	Rated voltage Edc:1,000 V	Rated voltage Edc:630 V
8.2 nF	3225	2.50+0.40,-0.30	±2 %	<a href="#">CNA6P1C0G3B822G250AE</a>	<a href="#">CNA6P4C0G2J333G250AE</a>	
			±5 %	<a href="#">CNA6P1C0G3B822J250AE</a>	<a href="#">CNA6P4C0G2J333J250AE</a>	
10 nF	3225	2.50+0.40,-0.30	±2 %	<a href="#">CNA6P1C0G3B103G250AE</a>	<a href="#">CNA6P1C0G3A103G250AE</a>	
			±5 %	<a href="#">CNA6P1C0G3B103J250AE</a>	<a href="#">CNA6P1C0G3A103J250AE</a>	
12 nF	3225	2.50+0.40,-0.30	±2 %	<a href="#">CNA6P1C0G3A123G250AE</a>		
			±5 %	<a href="#">CNA6P1C0G3A123J250AE</a>		
15 nF	3225	2.50+0.40,-0.30	±2 %	<a href="#">CNA6P1C0G3A153G250AE</a>		
			±5 %	<a href="#">CNA6P1C0G3A153J250AE</a>		
18 nF	3225	2.50+0.40,-0.30	±2 %	<a href="#">CNA6P1C0G3A183G250AE</a>		
			±5 %	<a href="#">CNA6P1C0G3A183J250AE</a>		
22 nF	3225	2.50+0.40,-0.30	±2 %	<a href="#">CNA6P1C0G3A223G250AE</a>		
			±5 %	<a href="#">CNA6P1C0G3A223J250AE</a>		
33 nF	3225	2.50+0.40,-0.30	±2 %	<a href="#">CNA6P4C0G2J333G250AE</a>		
			±5 %	<a href="#">CNA6P4C0G2J333J250AE</a>		

Click the part numbers for details.

## Capacitance range table

Temperature characteristic: NP0 (-55 to +150 °C, 0±30 ppm/°C)

Capacitance	Dimensions	Thickness (mm)	Cap tol	Catalog numbers
				Rated voltage Edc:630 V
33 nF	3225	2.50+0.40,-0.30	±2 %	<a href="#">CNA6P4NP02J333G250AE</a>
			±5 %	<a href="#">CNA6P4NP02J333J250AE</a>

Click the part numbers for details.

## Capacitance range table

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

Capacitance	Dimensions	Thickness (mm)	Cap tol	Catalog numbers				
				Rated voltage Edc:100 V	Rated voltage Edc:75 V	Rated voltage Edc:50 V	Rated voltage Edc:25 V	Rated voltage Edc:16 V
2.2 µF	3216	1.60+0.30,-0.20	±10 %	<a href="#">CNA5L1X7R1N225K160AE</a>				
				<a href="#">CNA5L1X7R1H225K160AE</a>				
4.7 µF	3216	1.60+0.30,-0.20	±10 %	<a href="#">CNA5L1X7R1H475K160AE</a>				
				3225	2.50±0.30	±10 %	<a href="#">CNA6P1X7R2A475K250AE</a>	<a href="#">CNA6P1X7R1H475K250AE</a>
10 µF	3216	1.60+0.30,-0.20	±10 %	<a href="#">CNA5L1X7R1H106K160AE</a>				
				<a href="#">CNA5L1X7R1E106K160AE</a>				
22 µF	3225	2.50±0.20	±10 %	<a href="#">CNA5L1X7R1C106K160AE</a>				
				<a href="#">CNA6P1X7R1H106K250AE</a>				
22 µF	3225	2.50±0.30	±20 %	<a href="#">CNA6P1X7R1E226M250AE</a>				

Click the part numbers for details.

## Capacitance range table

Temperature characteristic: X7S (-55 to +125 °C, ±22 %)

Capacitance	Dimensions	Thickness (mm)	Cap tol	Catalog numbers
				Rated voltage Edc:10 V
22 µF	3216	1.60+0.30,-0.20	±20 %	<a href="#">CNA5L1X7S1A226M160AE</a>
47 µF	3216	2.50±0.30	±20 %	<a href="#">CNA6P1X7S1A476M250AE</a>

Click the part numbers for details.



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