

Multilayer Ceramic Chip Capacitors

For automobile(Resin terminations)

C series

Type: C2012[EIA CC0805]
 C3216[EIA CC1206]
 C3225[EIA CC1210]
 C4532[EIA CC1812]
 C5750[EIA CC2220]

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.
5. Any reproduction or transferring of the contents of this catalog is prohibited without prior permission from our company.
6. 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.
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.
8. The descriptions in this catalog apply as of August, 2011.

Multilayer Ceramic Chip Capacitors For Automobile(Resin Terminations)

Conformity to RoHS Directive

C Series

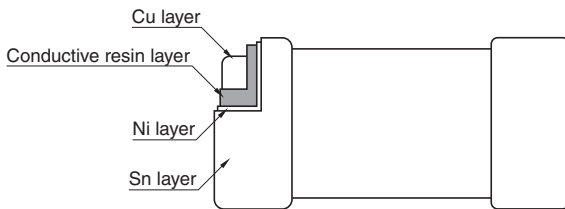
FEATURES

- A flexible conductive resin has been adopted for external terminations through TDK's original technology. This reduces mechanical stress and improves thermal shock resistance. In addition, the series features a high resistance to substrate bending.
- The product types listed in the brochure are just examples. We have available products that range from a small 1005 size to a large 5750 type. If you are interested in a product that is not in the brochure, please contact us.

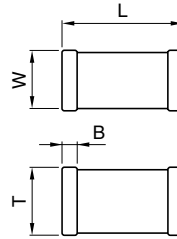
APPLICATION EXAMPLES

- Products that experience severe temperature changes, which require that consideration be given to measures against thermal shock.
- Applications which require that consideration be given to measures against flexural stress or shock applied to the substrate.

CONDUCTIVE RESIN TERMINATION STRUCTURE



SHAPES AND DIMENSIONS



DIMENSIONS

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

Dimensions L×W

The 4-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
2012	2.0±0.2	1.25±0.2	0.2min.
3216	3.2±0.2	1.6±0.2	0.2min.
3225	3.2±0.4	2.5±0.3	0.2min.
4532	3.2±0.4	3.2±0.4	0.2min.
5750	3.2±0.4	5.0±0.4	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

C 2012 X7R 2E 103 M (125 A E)
 (1) (2) (3) (4) (5) (6) (7) (8) (9)

(1) Series name

(2) Dimensions L×W

2012	2.0×1.25mm
3216	3.2×1.6mm
3225	3.2×2.5mm
4532	4.5×3.2mm
5750	5.7×5.0mm

(3) Capacitance temperature characteristics

Class 2 (Temperature stable and general purpose)

Temperature characteristics	Capacitance change	Temperature range
X7R	±15%	-55 to +125°C
X7S	±22%	-55 to +125°C
X7T	+22, -33%	-55 to +125°C

(4) Rated voltage E_{dc}

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

(5) 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.

333	33,000pF
474	470,000pF
225	2,200,000pF (2.2μF)

(6) Capacitance tolerance

Symbol	Tolerance
M	±20%

(7) Dimensions T

Expressed in three-digit numbers using mm units.

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

085	0.85mm
125	1.25mm

(8) 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

(9) 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: X7R(±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
10nF	2012	1.25±0.25	±20%			C2012X7R2E103M(125AE)	
	3216	1.15±0.15	±20%	C3216X7R2J103M(115AE)			
22nF	2012	1.25±0.25	±20%			C2012X7R2E223M(125AE)	
	3216	1.30±0.20	±20%	C3216X7R2J223M(130AE)			
47nF	3225	2.00±0.30	±20%	C3225X7R2J473M(200AE)			
100nF	3216	1.60±0.30	±20%			C3216X7R2E104M(160AE)	
	3225	2.00±0.30	±20%			C3225X7R2E104M(200AE)	
220nF	3216	1.60±0.30	±20%				C3216X7R2A474M(160AE)
	4532	2.30+0.30/-0.20	±20%			C4532X7R2E474M(230KE)	
1µF	3216	1.60±0.30	±20%				C3216X7R2A105M(160AE)
	5750	2.30+0.30/-0.20	±20%			C5750X7R2E105M(230KE)	
2.2µF	3225	2.30±0.30	±20%				C3225X7R2A225M(230AE)

TEMPERATURE CHARACTERISTICS: X7R(±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
470nF	2012	1.25±0.25	±20%	C2012X7R1H474M(125AE)			
1µF	2012	1.25±0.25	±20%	C2012X7R1H105M(125AE)			
	3216	1.60±0.30	±20%	C3216X7R1H105M(160AE)			
2.2µF	2012	1.25±0.25	±20%		C2012X7R1V225M(125AE)		
	3216	1.60±0.30	±20%	C3216X7R1H225M(160AE)			
4.7µF	2012	1.25±0.25	±20%				C2012X7R1C475M(125AE)
	3216	1.60±0.30	±20%		C3216X7R1V475M(160AE)		
10µF	3216	1.60±0.30	±20%			C3216X7R1E106M(160AE)	
4.7µF	3225	2.30±0.30	±20%	C3225X7S1H475M(230AE)			
10µF	3225	2.50±0.30	±20%	C3225X7S1H106M(250AE)			

TEMPERATURE CHARACTERISTICS: X7S(±22%)

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
220nF	2012	0.85±0.15	±20%				C2012X7S2A224M(085AE)
470nF	2012	1.25±0.25	±20%				C2012X7S2A474M(125AE)
1µF	2012	1.25±0.25	±20%				C2012X7S2A105M(125AE)
2.2µF	3216	1.60±0.30	±20%				C3216X7S2A225M(160AE)
4.7µF	3225	2.00±0.30	±20%				C3225X7S2A475M(200AE)
10µF	5750	2.30+0.25/-0.20	±20%				C5750X7S2A106M(230KE)

TEMPERATURE CHARACTERISTICS: X7T(+22, -33%)

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
10nF	2012	0.85±0.15	±20%		C2012X7T2W103M(085AE)		
22nF	2012	1.25±0.25	±20%		C2012X7T2W223M(125AE)		
47nF	2012	1.25±0.25	±20%		C2012X7T2W473M(125AE)	C2012X7T2E473M(125AE)	
	3216	1.60±0.30	±20%	C3216X7T2J473M(160AE)			
100nF	2012	1.25±0.25	±20%			C2012X7T2E104M(125AE)	
	3216	1.60±0.30	±20%		C3216X7T2W104M(160AE)		
	3225	1.60±0.20	±20%	C3225X7T2J104M(160AE)			
220nF	3216	1.60±0.30	±20%			C3216X7T2E224M(160AE)	
	3225	2.00+0.25/-0.20	±20%		C3225X7T2W224M(200AE)		
470nF	4532	2.00+0.25/-0.20	±20%	C4532X7T2J224M(200KE)			
	5750	2.50±0.20	±20%	C5750X7T2J474M(250KE)	C4532X7T2W474M(230KE)		
1µF	4532	2.50±0.20	±20%			C4532X7T2E105M(250KE)	
	5750	2.50±0.20	±20%		C5750X7T2W105M(250KE)		
2.2µF	5750	2.50±0.20	±20%			C5750X7T2E225M(250KE)	

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