



MULTILAYER CERAMIC CHIP CAPACITORS

C Series Commercial Grade Open Mode

Type:

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

Issue date:
Dec 2014



REMINDERS

Please read before using this product

SAFETY REMINDERS



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(Example)

| Catalog Issued date | Catalog Number | Item Description (On Delivery Label) |
|------------------------|---------------------|--------------------------------------|
| Prior to January 2013 | C1608C0G1E103J | C1608C0G1E103JT000N |
| January 2013 and Later | C1608C0G1E103J080AA | C1608C0G1E103JT000N |



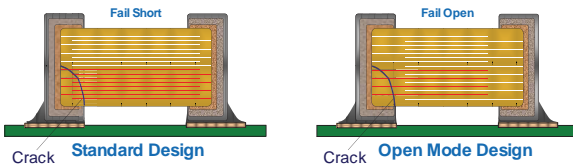
C Series Open Mode

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

Features



- When a chip capacitor is cracked by mechanical stress such as board bending, open mode construction helps user reduce the risk of short circuits.



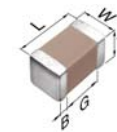
- Open Mode capacitor is designed with wider gap between the terminal and the internal electrodes to help reduce the risk of short circuit in the event of capacitor cracking due to mechanical stress such as board bending.

Applications



- High reliability and high mechanical stress applications
- Battery line circuits with high board flex stress
- DC-DC Converter

Shape & Dimensions



| | |
|---|------------------|
| L | Body Length |
| W | Body Width |
| T | Body Height |
| B | Terminal Width |
| G | Terminal Spacing |



Catalog Number Construction

C • 5750 • X7R • 1C • 226 • M • 280 • K • M

Series Name

Dimensions L x W (mm)

| Code | Length | Width | Terminal |
|-------|-------------|-------------|-----------|
| C2012 | 2.00 ± 0.20 | 1.25 ± 0.20 | 0.20 min. |
| C3216 | 3.20 ± 0.20 | 1.60 ± 0.20 | 0.20 min. |
| C3225 | 3.20 ± 0.40 | 2.50 ± 0.30 | 0.20 min. |
| C4532 | 4.50 ± 0.40 | 3.20 ± 0.40 | 0.20 min. |
| C5750 | 5.70 ± 0.40 | 5.00 ± 0.40 | 0.20 min. |

Temperature Characteristics

| Temperature Characteristics | Capacitance Change | Temperature Range |
|-----------------------------|--------------------|-------------------|
| X7R | ± 15% | -55 to +125°C |

Rated Voltage (DC)

| Code | Voltage (DC) | Code | Voltage (DC) |
|------|--------------|------|--------------|
| 1C | 16V | 2A | 100V |
| 1E | 25V | 2E | 250V |
| 1H | 50V | 2J | 630V |

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.

Ex. 0R2 = 0.2pF; 103 = 10,000pF; 105 = 1,000,000pF = 1,000nF

Capacitance Tolerance

| Code | Tolerance |
|------|-----------|
| K | ± 10% |
| M | ± 20% |

Nominal Thickness

| Code | Thickness |
|------|-----------|
| 085 | 0.85 mm |
| 115 | 1.15 mm |
| 125 | 1.25 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 |

Packaging Style

| Code | Style |
|------|-------------------------|
| A | 178 mm Reel, 4 mm Pitch |
| K | 178 mm Reel, 8 mm Pitch |

Special Reserved Code

| Code | Description |
|------|------------------|
| M | Open Mode Design |



Capacitance Range Chart

EIA CC0805 [C2012]

Capacitance Range Chart

Temperature Characteristics: X7R ($\pm 15\%$)
 Rated Voltage: 250V (2E), 100V (2A), 50V (1H)

| Capacitance (pF) | Code | Tolerance | X7R | | |
|------------------|------|---------------|-----------|-----------|----------|
| | | | 2E (250V) | 2A (100V) | 1H (50V) |
| 1,000 | 102 | K: $\pm 10\%$ | 0.85 mm | 0.85 mm | |
| 1,500 | 152 | | 0.85 mm | 0.85 mm | |
| 2,200 | 222 | | 0.85 mm | 0.85 mm | |
| 3,300 | 332 | | 0.85 mm | 0.85 mm | |
| 4,700 | 472 | | 0.85 mm | 0.85 mm | |
| 6,800 | 682 | | 0.85 mm | 0.85 mm | |
| 10,000 | 103 | | 0.85 mm | 0.85 mm | |
| 15,000 | 153 | | 0.85 mm | 0.85 mm | |
| 22,000 | 223 | | 0.85 mm | 0.85 mm | |
| 100,000 | 104 | | 1.25 mm | | 1.25 mm |

Standard Thickness

0.85 mm

1.25 mm



Capacitance Range Chart

EIA CC1206 [C3216]

Capacitance Range Chart

Temperature Characteristics: X7R ($\pm 15\%$)
 Rated Voltage: 630V (2J), 250V (2E), 100V (2A), 16V (1C)

| Capacitance (pF) | Code | Tolerance | X7R | | | | |
|------------------|------|---------------|---------------|-----------|-----------|----------|--|
| | | | 2J (630V) | 2E (250V) | 2A (100V) | 1C (16V) | |
| 1,000 | 102 | K: $\pm 10\%$ | 1.15 mm | | | | |
| 1,500 | 152 | | M: $\pm 20\%$ | 1.15 mm | | | |
| 2,200 | 222 | | | 1.15 mm | | | |
| 3,300 | 332 | | | 1.15 mm | | | |
| 4,700 | 472 | | | 1.15 mm | | | |
| 6,800 | 682 | | | 1.15 mm | | | |
| 10,000 | 103 | | | 1.15 mm | | | |
| 15,000 | 153 | | | 1.15 mm | | | |
| 22,000 | 223 | | | 1.15 mm | | | |
| 33,000 | 333 | | | 1.15 mm | | | |
| 47,000 | 473 | 1.15 mm | | | | | |
| 68,000 | 683 | 1.15 mm | | | | | |
| 100,000 | 104 | 1.60 mm | | | | | |
| 150,000 | 154 | 1.60 mm | | | | | |
| 1,000,000 | 105 | 1.60 mm | | | | | |
| 4,700,000 | 475 | 1.60 mm | | | | 1.60 mm | |

Standard Thickness

1.15 mm

1.30 mm

1.60 mm



Capacitance Range Chart

EIA CC1210 [C3225]

Capacitance Range Chart

Temperature Characteristics: X7R ($\pm 15\%$)

Rated Voltage: 630V (2J), 250V (2E), 100V (2A), 50V (1H), 16V (1C)

| Capacitance (pF) | Code | Tolerance | X7R | | | | | |
|------------------|------|---------------|-----------|-----------|-----------|----------|----------|----------|
| | | | 2J (630V) | 2E (250V) | 2A (100V) | 1H (50V) | 1E (25V) | 1C (16V) |
| 47,000 | 473 | K: $\pm 10\%$ | █ | | | | | |
| 68,000 | 683 | | █ | | | | | |
| 100,000 | 104 | | | | | | | |
| 150,000 | 154 | | | | | | | |
| 220,000 | 224 | | | | █ | | | |
| 330,000 | 334 | | | | | █ | | |
| 470,000 | 474 | | | | | | █ | |
| 680,000 | 684 | | | | | | █ | |
| 1,000,000 | 105 | | | | | █ | | |
| 1,500,000 | 155 | | | | | | | █ |
| 2,200,000 | 225 | | | | | █ | | |
| 3,300,000 | 335 | | | | | | | █ |
| 4,700,000 | 475 | | | | | | | █ |

Standard Thickness

- █ 1.15 mm
- █ 1.60 mm
- █ 2.00 mm
- █ 2.30 mm
- █ 2.50 mm



Capacitance Range Chart

EIA CC1812 [C4532]

Capacitance Range Chart

Temperature Characteristics: X7R ($\pm 15\%$)

Rated Voltage: 630V (2J), 250V (2E), 100V (2A), 50V (1H), 25V (1E), 16V (1C)

| Capacitance (pF) | Code | Tolerance | X7R | | | | | |
|------------------|------|---------------|-----------|-----------|-----------|----------|----------|----------|
| | | | 2J (630V) | 2E (250V) | 2A (100V) | 1H (50V) | 1E (25V) | 1C (16V) |
| 68,000 | 683 | K: $\pm 10\%$ | █ | | | | | |
| 100,000 | 104 | | █ | | | | | |
| 150,000 | 154 | | | | | | | |
| 220,000 | 224 | | | | | | | |
| 330,000 | 334 | | | | █ | | | |
| 470,000 | 474 | | | | | █ | | |
| 680,000 | 684 | | | | | | █ | |
| 1,000,000 | 105 | | | | | | | █ |
| 1,500,000 | 155 | | | | | | | █ |
| 3,300,000 | 335 | | | | | | | █ |
| 4,700,000 | 475 | | | | | | | █ |
| 6,800,000 | 685 | | | | | | | █ |
| 10,000,000 | 106 | | | | | | | █ |

Standard Thickness

- █ 1.60 mm
- █ 2.00 mm
- █ 2.30 mm



Capacitance Range Chart

EIA CC2220 [C5750]

Capacitance Range Chart

Temperature Characteristics: X7R ($\pm 15\%$)

Rated Voltage: 630V (2J), 250V (2E), 100V (2A), 50V (1H), 25V (1E), 16V (1C)

| Capacitance (pF) | Code | Tolerance | X7R | | | | | | |
|------------------|------|--------------------------------|--------------|--------------|--------------|-------------|-------------|-------------|--|
| | | | 2J (630V) | 2E (250V) | 2A (100V) | 1H (50V) | 1E (25V) | 1C (16V) | |
| 150,000 | 154 | K: $\pm 10\%$ M: $\pm 20\%$ | ■ | | | | | | |
| 220,000 | 224 | | | | | | | | |
| 330,000 | 334 | | | ■ | | | | | |
| 470,000 | 474 | | | ■ | | | | | |
| 680,000 | 684 | | | ■ | ■ | | | | |
| 1,000,000 | 105 | | | ■ | ■ | | | | |
| 1,500,000 | 155 | | | | ■ | | | | |
| 2,200,000 | 225 | | | | | ■ | | | |
| 3,300,000 | 335 | | | | | ■ | | | |
| 4,700,000 | 475 | | | | | ■ | | | |
| 6,800,000 | 685 | | | | | | ■ | | |
| 10,000,000 | 106 | | | | | | ■ | | |
| 15,000,000 | 156 | | | | | | ■ | | |
| 22,000,000 | 226 | | | | | | | ■ | |

Standard Thickness

- 1.60 mm
- 2.00 mm
- 2.30 mm
- 2.80 mm



Capacitance Range Table

Class 2 (Temperature Stable)

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

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | | |
|-------------|------|----------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|
| | | | | Rated Voltage Edc: 630V | Rated Voltage Edc: 250V | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V |
| 1 nF | 2012 | 0.85 ± 0.15 | ± 10% | | C2012X7R2E102K085AM | C2012X7R2A102K085AM | |
| | 3216 | 1.15 ± 0.15 | ± 10% | C3216X7R2J102K115AM | | | |
| 1.5 nF | 2012 | 0.85 ± 0.15 | ± 10% | | C2012X7R2E152K085AM | C2012X7R2A152K085AM | |
| | 3216 | 1.15 ± 0.15 | ± 10% | C3216X7R2J152K115AM | | | |
| 2.2 nF | 2012 | 0.85 ± 0.15 | ± 10% | | C2012X7R2E222K085AM | C2012X7R2A222K085AM | |
| | 3216 | 1.15 ± 0.15 | ± 10% | C3216X7R2J222K115AM | | | |
| 3.3 nF | 2012 | 0.85 ± 0.15 | ± 10% | | C2012X7R2E332K085AM | C2012X7R2A332K085AM | |
| | 3216 | 1.15 ± 0.15 | ± 10% | C3216X7R2J332K115AM | | | |
| 4.7 nF | 2012 | 0.85 ± 0.15 | ± 10% | | C2012X7R2E472K085AM | C2012X7R2A472K085AM | |
| | 3216 | 1.15 ± 0.15 | ± 10% | C3216X7R2J472K115AM | | | |
| 6.8 nF | 2012 | 0.85 ± 0.15 | ± 10% | | | C2012X7R2A682K085AM | |
| | | 1.25 ± 0.20 | ± 10% | | C2012X7R2E682K125AM | | |
| | 3216 | 1.15 ± 0.15 | ± 10% | C3216X7R2J682K115AM | | | |
| 10 nF | 2012 | 0.85 ± 0.15 | ± 10% | | | C2012X7R2A103K085AM | |
| | | 1.25 ± 0.20 | ± 10% | | C2012X7R2E103K125AM | | |
| | 3216 | 1.15 ± 0.15 | ± 10% | C3216X7R2J103K115AM | | | |
| 15 nF | 2012 | 1.25 ± 0.20 | ± 10% | | C2012X7R2E153K125AM | C2012X7R2A153K125AM | |
| | | 1.15 ± 0.15 | ± 10% | | C3216X7R2E153K115AM | | |
| | 3216 | 1.30 ± 0.20 | ± 10% | C3216X7R2J153K130AM | | | |
| 22 nF | 2012 | 1.25 ± 0.20 | ± 10% | | | C2012X7R2A223K125AM | |
| | | 1.15 ± 0.15 | ± 10% | | C3216X7R2E223K115AM | | |
| | 3216 | 1.30 ± 0.20 | ± 10% | C3216X7R2J223K130AM | | | |
| 33 nF | 3216 | 1.15 ± 0.15 | ± 10% | | | C3216X7R2A333K115AM | |
| | | 1.60 ± 0.20 | ± 10% | C3216X7R2J333K160AM | C3216X7R2E333K160AM | | |
| | | 1.15 ± 0.15 | ± 10% | | | C3216X7R2A473K115AM | |
| 47 nF | 3216 | 1.60 ± 0.20 | ± 10% | | C3216X7R2E473K160AM | | |
| | | 2.00 ± 0.20 | ± 10% | C3225X7R2J473K200AM | | | |
| | | 1.60 ± 0.20 | ± 10% | | C3216X7R2E683K160AM | C3216X7R2A683K160AM | |
| 68 nF | 3225 | 2.00 ± 0.20 | ± 10% | C3225X7R2J683K200AM | | | |
| | | 1.60 ± 0.20 | ± 10% | C4532X7R2J683K160KM | | | |
| | 4532 | 1.60 ± 0.20 | ± 10% | | | | |
| 100 nF | 2012 | 1.25 ± 0.20 | ± 10% | | | | C2012X7R1H104K125AM |
| | | 1.60 ± 0.20 | ± 10% | | C3216X7R2E104K160AM | C3216X7R2A104K160AM | |
| | 3225 | 2.00 ± 0.20 | ± 10% | | C3225X7R2E104K200AM | | |
| | | 2.30 ± 0.20 | ± 10% | C4532X7R2J104K230KM | | | |
| | 3216 | 1.60 ± 0.20 | ± 10% | | | C3216X7R2A154K160AM | |
| 150 nF | 3225 | 2.00 ± 0.20 | ± 10% | | C3225X7R2E154K200AM | | |
| | | 1.60 ± 0.20 | ± 10% | | C4532X7R2E154K160KM | | |
| | 5750 | 1.60 ± 0.20 | ± 10% | C5750X7R2J154K160KM | | | |
| | | 2.00 ± 0.20 | ± 10% | | C3225X7R2E224K200AM | | |
| 220 nF | 4532 | 2.30 ± 0.20 | ± 10% | | C4532X7R2E224K230KM | | |
| | | 2.30 ± 0.20 | ± 10% | C5750X7R2J224K230KM | | | |
| | 5750 | 2.30 ± 0.20 | ± 10% | | | | |
| 330 nF | 3225 | 2.00 ± 0.20 | ± 10% | | | C3225X7R2A334K200AM | |
| | | 2.30 ± 0.20 | ± 10% | | C4532X7R2E334K230KM | | |
| | 5750 | 1.60 ± 0.20 | ± 10% | | C5750X7R2E334K160KM | | |
| 470 nF | 3225 | 1.60 ± 0.20 | ± 10% | | | | C3225X7R1H474K160AM |
| | | 2.30 ± 0.20 | ± 10% | | C4532X7R2E474K230KM | | |
| | 5750 | 2.30 ± 0.20 | ± 10% | | C5750X7R2E474K230KM | | |
| 680 nF | 3225 | 2.00 ± 0.20 | ± 10% | | | | C3225X7R1H684K200AM |
| | | 2.30 ± 0.20 | ± 10% | | C4532X7R2A684K230KM | | |
| | 5750 | 1.60 ± 0.20 | ± 10% | | C5750X7R2A684K160KM | | |
| | | 2.30 ± 0.20 | ± 10% | | C5750X7R2E684K230KM | | |



Capacitance Range Table

Class 2 (Temperature Stable)

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

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | | |
|-------------|------|----------------|-----------------------|-------------------------|-------------------------|------------------------|------------------------|
| | | | | Rated Voltage Edc: 250V | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V | Rated Voltage Edc: 25V |
| 1 µF | 3216 | 1.60 ± 0.20 | ± 10% | | C3216X7R2A105K160AM | | |
| | | 1.15 ± 0.15 | ± 10% | | | | C3225X7R1E105K115AM |
| | 3225 | 2.00 ± 0.20 | ± 10% | | C3225X7R2A105K200AM | | |
| | | 1.60 ± 0.20 | ± 10% | | | C4532X7R1H105K160KM | |
| 1.5 µF | 3225 | 2.30 ± 0.20 | ± 10% | C5750X7R2E105K230KM | C5750X7R2A105K230KM | | |
| | | 1.60 ± 0.20 | ± 10% | | | | C3225X7R1E155K160AM |
| | 4532 | 2.30 ± 0.20 | ± 10% | | | C4532X7R1H155K230KM | |
| | | 2.30 ± 0.20 | ± 10% | | C5750X7R2A155K230KM | | |
| 2.2 µF | 3225 | 2.00 ± 0.20 | ± 10% | | | | C3225X7R1E225K200AM |
| | | 2.30 ± 0.20 | ± 10% | | C3225X7R2A225K230AM | | |
| | 5750 | 1.60 ± 0.20 | ± 10% | | | C5750X7R1H225K160KM | |

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | | |
|-------------|------|----------------|-----------------------|-------------------------|------------------------|------------------------|------------------------|
| | | | | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V | Rated Voltage Edc: 25V | Rated Voltage Edc: 16V |
| 3.3 µF | 3225 | 2.00 ± 0.20 | ± 10% | | | | C3225X7R1C335K200AM |
| | | 1.60 ± 0.20 | ± 10% | | | C4532X7R1E335K160KM | |
| | 5750 | 2.30 ± 0.20 | ± 10% | | C5750X7R1H335K230KM | | |
| 4.7 µF | 3216 | 1.60 ± 0.20 | ± 20% | | | | C3216X7R1C475M160AM |
| | | 2.50 ± 0.30 | ± 10% | | | | C3225X7R1C475K250AM |
| | 4532 | 2.00 ± 0.20 | ± 10% | | | C4532X7R1E475K200KM | |
| | | 2.80 ± 0.30 | ± 10% | | C5750X7R1H475K280KM | | |
| 6.8 µF | 4532 | 2.00 ± 0.20 | ± 10% | | | | C4532X7R1C685K200KM |
| | 5750 | 1.60 ± 0.20 | ± 10% | | C5750X7R1E685K160KM | | |
| 10 µF | 4532 | 2.30 ± 0.20 | ± 10% | | | | C4532X7R1C106K230KM |
| | 5750 | 2.00 ± 0.20 | ± 10% | | C5750X7R1E106K200KM | | |
| 15 µF | 5750 | 2.80 ± 0.30 | ± 20% | | C5750X7R1E156M280KM | | |
| 22 µF | 5750 | 2.80 ± 0.30 | ± 20% | | | | C5750X7R1C226M280KM |