



MULTILAYER CERAMIC CHIP CAPACITORS

CGA Series Automotive Grade High Voltage (1000V and over)

Type:

CGA7 [EIA CC1808]

CGA8 [EIA CC1812]

Issue date:
Apr 2015



REMINDERS

Please read before using this product

SAFETY REMINDERS



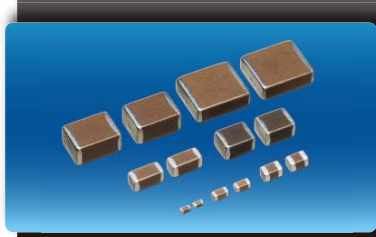
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(Example)

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



CGA Series

High Voltage (1000V and over)

Type: CGA7 [EIA CC1808], CGA8 [EIA CC1812]

Features



- Advanced design provides improved withstand voltage characteristics.
- TDK's proprietary internal electrode structure and the use of low-dielectric-strength material result in highly reliable performance in high-voltage applications.
- Complies with ISO8802-3 for LAN applications.
- Designed exclusively for reflow soldering.
- AEC-Q200 compliant.

Applications



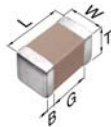
- Application in decoupling and snubber of high voltage circuits of EVs or HEVs
- General high voltage circuits.
- Noise bypass for power supply
- Transceiver for LAN
- Hub, etc

Cautions



- A slit of about 1mm on the circuit board is recommended to improve removal of the flux after soldering.
- Ensure that this product is completely dried following washing.
- Because this product will be subjected to high voltages, use only low-activity rosin flux (with 0.2% max. of chlorine).
- Using this product with aluminum circuit boards must be considered a special implementation because the high heat stress levels are involved. In case of using aluminum circuit boards, please contact TDK.

Shape & Dimensions



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



Catalog Number Construction

CGA • 8 • M • 1 • X7R • 3A • 103 • K • 200 • K • A

Series Name

Dimensions L x W (mm)

| Code | Length | Width | Terminal |
|------|-------------|-------------|-----------|
| 7 | 4.50 ± 0.40 | 2.00 ± 0.30 | 0.20 min. |
| 8 | 4.50 ± 0.40 | 3.20 ± 0.40 | 0.20 min. |

Thickness T Code (mm)

| Code | Thickness | Code | Thickness |
|------|-----------|------|-----------|
| F | 0.85 mm | M | 2.00 mm |
| G | 1.10 mm | N | 2.30 mm |
| K | 1.30 mm | P | 2.50 mm |
| L | 1.60 mm | | |

Voltage Condition for Life Test

| Symbol | Condition |
|--------|-----------|
| 1 | 1 x R.V. |

Temperature Characteristics

| Temperature Characteristics | Temperature Coefficient or Capacitance Change | Temperature Range |
|-----------------------------|---|-------------------|
| C0G | 0±30 ppm/°C | -55 to +125°C |
| X7R | ±15% | -55 to +125°C |

Rated Voltage (DC)

| Code | Voltage (DC) |
|------|--------------|
| 3A | 1,000V |
| 3D | 2,000V |
| 3F | 3,000V |

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 = 1μF

Capacitance Tolerance

| Code | Tolerance |
|------|-----------|
| F | ± 1pF |
| K | ± 10% |
| M | ± 20% |

Nominal Thickness

| Code | Thickness | Code | Thickness | Code | Thickness |
|------|-----------|------|-----------|------|-----------|
| 085 | 0.85 mm | 160 | 1.60 mm | 250 | 2.50 mm |
| 110 | 1.10 mm | 200 | 2.00 mm | | |
| 130 | 1.30 mm | 230 | 2.30 mm | | |

Packaging Style

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

Special Reserved Code

| Code | Description |
|------|-------------------|
| A, B | TDK Internal Code |



Capacitance Range Chart

CGA7(4520) [EIA CC1808]

Capacitance Range Chart

Temperature Characteristics: C0G ($0 \pm 30\text{ppm}/^\circ\text{C}$), X7R ($\pm 15\%$)
 Rated Voltage: 3000V (3F), 2000V (3D), 1000V (3A)

| Capacitance (pF) | Code | Tolerance | C0G | | X7R | |
|------------------|------|---|----------|----------|----------|--|
| | | | 3F (3KV) | 3D (2KV) | 3A (1KV) | |
| 10 | 100 | F: $\pm 1\text{pF}$ K: $\pm 10\%$ M: $\pm 20\%$ | | | | |
| 12 | 120 | | | | | |
| 15 | 150 | | | | | |
| 18 | 180 | | | | | |
| 22 | 220 | | | | | |
| 27 | 270 | | | | | |
| 33 | 330 | | | | | |
| 39 | 390 | | | | | |
| 47 | 470 | | | | | |
| 56 | 560 | | | | | |
| 68 | 680 | | | | | |
| 82 | 820 | | | | | |
| 100 | 101 | | | | | |
| 470 | 471 | | | | | |
| 1,000 | 102 | | | | | |

Standard Thickness

- 0.85 mm
- 1.10 mm
- 1.30 mm
- 1.60 mm
- 2.00 mm



Capacitance Range Chart

CGA8(4532) [EIA CC1812]

Capacitance Range Chart

Temperature Characteristics: C0G ($0 \pm 30\text{ppm}/^\circ\text{C}$), X7R ($\pm 15\%$)
 Rated Voltage: 3000V (3F), 2000V (3D), 1000V (3A)

| Capacitance (pF) | Code | Tolerance | C0G | | X7R | |
|------------------|------|--------------------------------|----------|----------|----------|--|
| | | | 3F (3KV) | 3D (2KV) | 3A (1KV) | |
| 100 | 101 | K: $\pm 10\%$ M: $\pm 20\%$ | | | | |
| 120 | 121 | | | | | |
| 150 | 151 | | | | | |
| 180 | 181 | | | | | |
| 220 | 221 | | | | | |
| 270 | 271 | | | | | |
| 330 | 331 | | | | | |
| 2,200 | 222 | | | | | |
| 4,700 | 472 | | | | | |
| 10,000 | 103 | | | | | |

Standard Thickness

- 1.30 mm
- 1.60 mm
- 2.00 mm
- 2.30 mm
- 2.50 mm



Capacitance Range Table

Class 1 (Temperature Compensating)

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

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | |
|-------------|------|----------------|-----------------------|------------------------|------------------------|------------------------|
| | | | | Rated Voltage Edc: 3KV | Rated Voltage Edc: 2KV | Rated Voltage Edc: 1KV |
| 10 pF | 4520 | 0.85 ± 0.15 | ± 1pF | CGA7F1C0G3F100F085KA | | |
| 12 pF | 4520 | 0.85 ± 0.15 | ± 10% | CGA7F1C0G3F120K085KA | | |
| 15 pF | 4520 | 1.10 ± 0.20 | ± 10% | CGA7G1C0G3F150K110KA | | |
| 18 pF | 4520 | 1.10 ± 0.20 | ± 10% | CGA7G1C0G3F180K110KA | | |
| 22 pF | 4520 | 1.10 ± 0.20 | ± 10% | CGA7G1C0G3F220K110KA | | |
| 27 pF | 4520 | 1.60 ± 0.20 | ± 10% | CGA7L1C0G3F270K160KA | | |
| 33 pF | 4520 | 1.60 ± 0.20 | ± 10% | CGA7L1C0G3F330K160KA | | |
| 39 pF | 4520 | 1.60 ± 0.20 | ± 10% | CGA7L1C0G3F390K160KA | | |
| 47 pF | 4520 | 1.60 ± 0.20 | ± 10% | CGA7L1C0G3F470K160KA | | |
| 56 pF | 4520 | 2.00 ± 0.20 | ± 10% | CGA7M1C0G3F560K200KA | | |
| 68 pF | 4520 | 2.00 ± 0.20 | ± 10% | CGA7M1C0G3F680K200KA | | |
| 82 pF | 4520 | 2.00 ± 0.20 | ± 10% | CGA7M1C0G3F820K200KA | | |
| 100 pF | 4520 | 2.00 ± 0.20 | ± 10% | CGA7M1C0G3F101K200KA | | |
| | 4532 | 1.60 ± 0.20 | ± 10% | CGA8L1C0G3F101K160KA | | |
| 120 pF | 4532 | 1.60 ± 0.20 | ± 10% | CGA8L1C0G3F121K160KA | | |
| 150 pF | 4532 | 1.60 ± 0.20 | ± 10% | CGA8L1C0G3F151K160KA | | |
| 180 pF | 4532 | 1.60 ± 0.20 | ± 10% | CGA8L1C0G3F181K160KA | | |
| 220 pF | 4532 | 2.00 ± 0.20 | ± 10% | CGA8M1C0G3F221K200KA | | |
| 270 pF | 4532 | 2.30 ± 0.20 | ± 10% | CGA8N1C0G3F271K230KA | | |
| 330 pF | 4532 | 2.50 ± 0.30 | ± 10% | CGA8P1C0G3F331K250KA | | |

Class 2 (Temperature Stable)

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

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | |
|-------------|------|----------------|-----------------------|------------------------|------------------------|------------------------|
| | | | | Rated Voltage Edc: 3KV | Rated Voltage Edc: 2KV | Rated Voltage Edc: 1KV |
| 470 pF | 4520 | 1.30 ± 0.20 | ± 10% | CGA7K1X7R3D471K130KA | CGA7K1X7R3A471K130KA | |
| | | | ± 20% | CGA7K1X7R3D471M130KA | CGA7K1X7R3A471M130KA | |
| 1 nF | 4520 | 1.30 ± 0.20 | ± 10% | CGA7K1X7R3D102K130KA | CGA7K1X7R3A102K130KA | |
| | | | ± 20% | CGA7K1X7R3D102M130KA | CGA7K1X7R3A102M130KA | |
| 2.2 nF | 4532 | 1.30 ± 0.20 | ± 10% | CGA8K1X7R3D222K130KA | | |
| | | | ± 20% | CGA8K1X7R3D222M130KA | | |
| 4.7 nF | 4532 | 1.60 ± 0.20 | ± 10% | | CGA8L1X7R3A472K160KA | |
| | | | ± 20% | | CGA8L1X7R3A472M160KA | |
| 10 nF | 4532 | 2.00 ± 0.20 | ± 10% | | CGA8M1X7R3A103K200KA | |
| | | | ± 20% | | CGA8M1X7R3A103M200KA | |