



MULTILAYER CERAMIC CHIP CAPACITORS

CGB Series Commercial Grade Low Profile

Type:

CGB1 [EIA CC0201]
CGB2 [EIA CC0402]
CGB3 [EIA CC0603]
CGB4 [EIA CC0805]

Issue date:
Apr 2015



REMINDERS

Please read before using this product

SAFETY REMINDERS



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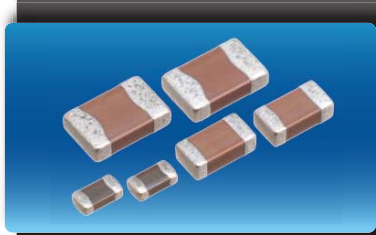
(Example)

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



CGB Series Low Profile

Type: CGB1 [EIA CC0201], CGB2 [EIA CC0402], CGB3 [EIA CC0603], CGB4 [EIA CC0805]



Features



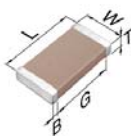
- Available in four sizes (0201, 0402, 0603, 0805) and as thin as 0.22mm.
- Capacitance offering from 0.1 μ F and up to 10 μ F.
- Ideal for height-restricted applications such as mobile phone.

Applications



- Smart Phone
- LCD modules
- Height restricted applications

Shape & Dimensions



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



Catalog Number Construction

CGB • 3 • C • 1 • X5R • 0J • 106 • M • 065 • A • C

Series Name

Dimensions L x W (mm)

| Code | Length | Width | Terminal |
|------|-----------------|-----------------|-----------|
| 1 | 0.60 \pm 0.03 | 0.30 \pm 0.03 | 0.10 min. |
| 2 | 1.00 \pm 0.05 | 0.50 \pm 0.05 | 0.10 min. |
| 3 | 1.60 \pm 0.10 | 0.80 \pm 0.10 | 0.20 min. |
| 4 | 2.00 \pm 0.20 | 1.25 \pm 0.20 | 0.20 min. |

Thickness T Code (mm)

| Code | Thickness |
|------|--------------|
| T | 0.22 mm max. |
| A | 0.33 mm max. |
| S | 0.50 mm max. |
| B | 0.55 mm max. |
| C | 0.65 mm max. |

Voltage Condition for Life Test

| Symbol | Condition |
|--------|------------|
| 1 | 1 x R.V. |
| 3 | 1.5 x R.V. |

Temperature Characteristics

| Temperature Characteristics | Capacitance Change | Temperature Range | Code | Rated Voltage (DC) |
|-----------------------------|--------------------|-------------------|------|--------------------|
| JB | \pm 10% | -25 to +85°C | 0G | 4.0V |
| X5R | \pm 15% | -55 to +85°C | 0J | 6.3V |
| X6S | \pm 22% | -55 to +105°C | 1A | 10V |
| X7R | \pm 15% | -55 to +125°C | 1C | 16V |
| X7S | \pm 22% | 55 to +125°C | 1E | 25V |

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 = 1 μ F

Capacitance Tolerance

| Code | Tolerance |
|------|-----------|
| K | \pm 10% |
| M | \pm 20% |

Nominal Thickness

| Code | Thickness |
|------|--------------|
| 022 | 0.22 mm max. |
| 033 | 0.33 mm max. |
| 050 | 0.50 mm max. |
| 055 | 0.55 mm max. |
| 065 | 0.65 mm max. |

Packaging Style

| Code | Style |
|------|-------------------------|
| A | 178 mm Reel, 4 mm Pitch |
| B | 178 mm Reel, 2 mm Pitch |

Special Reserved Code

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



Capacitance Range Chart

CGB1(0603) [EIA CC0201]

Capacitance Range Chart

Temperature Characteristics: X5R ($\pm 15\%$), X6S ($\pm 22\%$)
 Rated Voltage: 6.3V (0J), 4V (0G)

| Capacitance (pF) | Code | Tolerance | X5R | X6S |
|------------------|------|----------------|-----------|---------|
| | | | 0J (6.3V) | 0G (4V) |
| 100,000 | 104 | M : $\pm 20\%$ | | |

Standard Thickness 0.22 mm



Capacitance Range Chart

CGB2(1005) [EIA CC0402]

Capacitance Range Chart

Temperature Characteristics: JB ($\pm 10\%$), X5R ($\pm 15\%$), X6S ($\pm 22\%$), X7S ($\pm 22\%$)
 Rated Voltage: 25V (1E), 16V (1C), 10V (1A), 6.3V (0J), 4V (0G)

| Capacitance (pF) | Code | Tolerance | JB | | | | | X5R | | | | | | |
|------------------|------|----------------|----------|----------|----------|-----------|---------|----------|----------|----------|-----------|---------|--|--|
| | | | 1E (25V) | 1C (16V) | 1A (10V) | 0J (6.3V) | 0G (4V) | 1E (25V) | 1C (16V) | 1A (10V) | 0J (6.3V) | 0G (4V) | | |
| 220,000 | 224 | K : $\pm 10\%$ | | | | | | | | | | | | |
| 470,000 | 474 | M : $\pm 20\%$ | | | | | | | | | | | | |
| 1,000,000 | 105 | | | | | | | | | | | | | |
| 2,200,000 | 225 | | | | | | | | | | | | | |

| Capacitance (pF) | Code | Tolerance | X6S | | | X7S | |
|------------------|------|----------------|----------|-----------|---------|-----------|---------|
| | | | 1A (10V) | 0J (6.3V) | 0G (4V) | 0J (6.3V) | 0G (4V) |
| 220,000 | 224 | K : $\pm 10\%$ | | | | | |
| 470,000 | 474 | M : $\pm 20\%$ | | | | | |
| 1,000,000 | 105 | | | | | | |

Standard Thickness 0.22 mm max.
 0.33 mm max.



Capacitance Range Chart

CGB3(1608) [EIA CC0603]

Capacitance Range Chart

Temperature Characteristics: JB ($\pm 10\%$), X5R ($\pm 15\%$), X6S ($\pm 22\%$), X7R ($\pm 15\%$), X7S ($\pm 22\%$)
 Rated Voltage: 25V (1E), 16V (1C), 10V (1A), 6.3V (0J), 4V (0G)

| Capacitance (pF) | Code | Tolerance | JB | | | | | X5R | | | | | |
|------------------|------|----------------|----------|----------|----------|-----------|---------|----------|----------|----------|-----------|---------|--|
| | | | 1E (25V) | 1C (16V) | 1A (10V) | 0J (6.3V) | 0G (4V) | 1E (25V) | 1C (16V) | 1A (10V) | 0J (6.3V) | 0G (4V) | |
| 470,000 | 474 | K : $\pm 10\%$ | | | | | | | | | | | |
| 1,000,000 | 105 | M : $\pm 20\%$ | | | | | | | | | | | |
| 2,200,000 | 225 | | | | | | | | | | | | |
| 4,700,000 | 475 | | | | | | | | | | | | |
| 10,000,000 | 106 | | | | | | | | | | | | |

| Capacitance (pF) | Code | Tolerance | X6S | | | | X7R | | X7S |
|------------------|------|----------------|----------|----------|-----------|---------|----------|-----------|---------|
| | | | 1C (16V) | 1A (10V) | 0J (6.3V) | 0G (4V) | 1A (10V) | 0J (6.3V) | 0G (4V) |
| 1,000,000 | 105 | K : $\pm 10\%$ | | | | | | | |
| 2,200,000 | 225 | M : $\pm 20\%$ | | | | | | | |
| 4,700,000 | 475 | | | | | | | | |

Standard Thickness 0.50 mm max.
 0.55 mm max.



Capacitance Range Chart

CGB4(2012) [EIA CC0805]

Capacitance Range Chart

Temperature Characteristics: JB ($\pm 10\%$), X5R ($\pm 15\%$), X6S ($\pm 22\%$), X7R ($\pm 15\%$)
 Rated Voltage: 25V (1E), 16V (1C), 10V (1A), 6.3V (0J), 4V (0G)

| Capacitance (pF) | Code | Tolerance | JB | | | X5R | | | X6S | | | X7R | |
|------------------|------|---------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|----------|-----------|
| | | | 1E (25V) | 1C (16V) | 1A (10V) | 1E (25V) | 1C (16V) | 1A (10V) | 1C (16V) | 1A (10V) | 0J (6.3V) | 1A (10V) | 0J (6.3V) |
| 680,000 | 684 | K: $\pm 10\%$ | | | | | | | | | | | |
| 1,000,000 | 105 | M: $\pm 20\%$ | ■ | | | ■ | | | | | | | |
| 2,200,000 | 225 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

Standard Thickness

■ 0.55 mm max.



Capacitance Range Table

Class 2 (Temperature Stable)

Temperature Characteristics: JB (-25 to +85°C, ±10%)

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | | |
|-------------|------|----------------|-----------------------|------------------------|------------------------|------------------------|-------------------------|
| | | | | Rated Voltage Edc: 25V | Rated Voltage Edc: 16V | Rated Voltage Edc: 10V | Rated Voltage Edc: 6.3V |
| 470nF | 1005 | 0.33max. | ±10% | CGB2A3JB1A474K033BB | | | |
| | | | ±20% | CGB2A1JB1C474K033BC | | | |
| | 1608 | 0.55max. | ±10% | CGB2A3JB1A474M033BB | | | |
| | | | ±20% | CGB2A1JB1C474M033BC | | | |
| 1µF | 1005 | 0.33max. | ±10% | CGB3B3JB1E474K055AB | CGB2A3JB0J105K033BB | | |
| | | | ±20% | CGB3B3JB1E474M055AB | CGB2A1JB1C105K033BC | CGB2A1JB1C105K033BC | CGB2A1JB1A105K033BC |
| | 1608 | 0.55max. | ±10% | CGB2A1JB1E105M033BC | CGB2A1JB1C105M033BC | CGB2A1JB1A105M033BC | CGB2A3JB0J105M033BB |
| | | | ±20% | CGB2A1JB1E105M033BC | CGB2A1JB1C105M033BC | CGB2A1JB1A105M033BC | CGB2A3JB0J105M033BB |
| | 2012 | 0.55max. | ±10% | CGB3B3JB1C105K055AB | CGB3B3JB1E105K055AC | | |
| | | | ±20% | CGB3B3JB1C105M055AB | CGB3B3JB1E105M055AC | | |
| | | | ±10% | CGB4B3JB1E105K055AB | CGB3B3JB1E105M055AC | | |
| | | | ±20% | CGB4B3JB1E105M055AB | CGB3B3JB1C105M055AB | | |
| 2.2µF | 1005 | 0.33max. | ±20% | CGB2A1JB0J225M033BC | | | |
| | | | ±10% | CGB3B3JB1C225K055AC | | | |
| | 1608 | 0.55max. | ±20% | CGB3B3JB1A225K055AB | CGB3B3JB1A225M055AB | CGB3B3JB1A225M055AB | |
| | | | ±10% | CGB4B3JB1E225K055AC | CGB4B3JB1C225K055AB | CGB4B3JB1A225K055AB | CGB4B3JB1A225M055AB |
| 4.7µF | 1608 | 0.55max. | ±10% | CGB4B3JB1E225M055AC | CGB4B3JB1C225M055AB | CGB4B3JB1A225M055AB | CGB3B3JB0J475K055AB |
| | | | ±20% | CGB4B3JB1E225M055AC | CGB4B3JB1C225M055AB | CGB4B3JB1A225M055AB | CGB3B3JB0J475M055AB |
| | | | ±10% | CGB3B3JB1A475K055AC | | | |
| | | | ±20% | CGB3B3JB1A475M055AC | | | |
| 10µF | 1608 | 0.50max. | ±20% | CGB3S1JB0J106M050AC | | | |
| | | 0.65max. | ±20% | CGB3C1JB0J106M065AC | | | |

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number |
|-------------|------|----------------|-----------------------|-------------------------|
| | | | | Rated Voltage Edc: 4.0V |
| 1 µF | 1005 | 0.33max. | ± 10% | CGB2A3JB0G105K033BB |
| | | | ± 20% | CGB2A3JB0G105M033BB |
| 10µF | 1608 | 0.50max. | ± 20% | CGB3S3JB0G106M050AB |



Capacitance Range Table

Class 2 (Temperature Stable)

Temperature Characteristics: X5R (-55 to +85°C, ±15%)

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | | | |
|-------------|----------|----------------|-----------------------|------------------------|------------------------|------------------------|-------------------------|--|
| | | | | Rated Voltage Edc: 25V | Rated Voltage Edc: 16V | Rated Voltage Edc: 10V | Rated Voltage Edc: 6.3V | |
| 100nF | 0603 | 0.22max. | ±20% | | | | CGB1T3X5R0J104M022BB | |
| 220nF | 1005 | 0.22max. | ±20% | | | | CGB2T3X5R0J224M022BB | |
| | | 0.22max. | ±20% | | | | CGB2T3X5R0J474M022BB | |
| 470nF | 1005 | 0.33max. | ±10% | | | CGB2A3X5R1A474K033BB | | |
| | | | | | CGB2A1X5R1C474K033BC | | | |
| | ±20% | | | CGB2A3X5R1A474M033BB | | | | |
| | | | CGB2A1X5R1C474M033BC | | | | | |
| 1608 | 0.55max. | ±10% | | CGB3B3X5R1E474K055AB | | | | |
| | | ±20% | | CGB3B3X5R1E474M055AB | | | | |
| 1µF | 1005 | 0.33max. | ±10% | CGB2A1X5R1E105K033BC | CGB2A1X5R1C105K033BC | CGB2A1X5R1A105K033BC | CGB2A3X5R0J105K033BB | |
| | | | ±20% | CGB2A1X5R1E105M033BC | CGB2A1X5R1C105M033BC | CGB2A1X5R1A105M033BC | CGB2A3X5R0J105M033BB | |
| | 1608 | 0.55max. | ±10% | CGB3B1X5R1E105K055AC | | | | |
| | | | ±20% | CGB3B3X5R1C105M055AB | | | | |
| | 2012 | 0.55max. | ±10% | CGB4B3X5R1E105K055AB | | | | |
| | | | ±20% | CGB4B3X5R1E105M055AB | | | | |
| 2.2µF | 1005 | 0.33max. | ±20% | | | | CGB2A1X5R0J225M033BC | |
| | | | ±10% | CGB3B1X5R1C225K055AC | CGB3B3X5R1A225K055AB | | | |
| | 1608 | 0.55max. | ±20% | CGB3B1X5R1C225M055AC | CGB3B3X5R1A225M055AB | | | |
| | | | ±10% | CGB4B1X5R1E225K055AC | CGB4B3X5R1C225K055AB | CGB4B3X5R1A225K055AB | | |
| 2012 | 0.55max. | ±20% | CGB4B1X5R1E225M055AC | CGB4B3X5R1C225M055AB | CGB4B3X5R1A225M055AB | | | |
| | | ±10% | | | | | | |
| 4.7µF | 1608 | 0.55max. | ±10% | | | CGB3B1X5R1A475K055AC | CGB3B3X5R0J475K055AB | |
| | | | ±20% | | | CGB3B1X5R1A475M055AC | CGB3B3X5R0J475M055AB | |
| 10µF | 1608 | 0.50max. | ±20% | | | | CGB3S1X5R0J106M050AC | |
| | | 0.65max. | ±20% | | | | CGB3C1X5R0J106M065AC | |

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number |
|-------------|------|----------------|-----------------------|-------------------------|
| | | | | Rated Voltage Edc: 4.0V |
| 470 nF | 1005 | 0.22max. | ± 20% | CGB2T1X5R0G474M022BC |
| | | 0.22max. | ± 20% | CGB2T1X5R0G105M022BC |
| 1 µF | 1005 | 0.33max. | ± 10% | CGB2A3X5R0G105K033BB |
| | | | ± 20% | CGB2A3X5R0G105M033BB |
| 10µF | 1608 | 0.50max. | ±20% | CGB3S3X5R0G106M050AB |



Capacitance Range Table

Class 2 (Temperature Stable)

Temperature Characteristics: X6S (-55 to +105°C, ±22%)

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | | | |
|-------------|------|----------------|-----------------------|------------------------|------------------------|-------------------------|-------------------------|----------------------|
| | | | | Rated Voltage Edc: 16V | Rated Voltage Edc: 10V | Rated Voltage Edc: 6.3V | Rated Voltage Edc: 4.0V | |
| 100nF | 0603 | 0.22max. | ±20% | | | | CGB1T3X6S0G104M022BB | |
| 220nF | 1005 | 0.22max. | ±20% | | | | CGB2T1X6S0G224M022BC | |
| | | 0.22max. | ±20% | | | | CGB2T1X6S0G474M022BC | |
| 470nF | 1005 | 0.33max. | ±10% | | CGB2A1X6S1A474K033BC | CGB2A3X6S0J474K033BB | CGB2A1X6S0G474K033BC | |
| | | | ±20% | | CGB2A1X6S1A474M033BC | CGB2A3X6S0J474M033BB | CGB2A1X6S0G474M033BC | |
| | | 0.22max. | ±20% | | | | | CGB2T1X6S0G105M022BC |
| | | | ±10% | | CGB2A1X6S1A105K033BC | CGB2A1X6S0J105K033BC | CGB2A1X6S0G105K033BC | |
| 1µF | 1005 | 0.33max. | ±20% | | CGB2A1X6S1A105M033BC | CGB2A1X6S0J105M033BC | CGB2A1X6S0G105M033BC | |
| | | | ±10% | | CGB3B1X6S1C105M055AC | CGB3B3X6S1A105K055AB | | |
| | | 0.55max. | ±20% | | CGB3B1X6S1C105M055AC | CGB3B3X6S1A105M055AB | | |
| | | | ±10% | | CGB3B1X6S1A225K055AC | CGB3B3X6S0J225K055AB | CGB3B3X6S0G225K055AB | |
| 2.2µF | 1608 | 0.55max. | ±20% | | CGB3B1X6S1A225M055AC | CGB3B3X6S0J225M055AB | CGB3B3X6S0G225M055AB | |
| | | | ±10% | | CGB4B1X6S1C225K055AC | CGB4B3X6S1A225K055AB | CGB4B3X6S0J225K055AB | |
| | | 0.55max. | ±20% | | CGB4B1X6S1C225M055AC | CGB4B3X6S1A225M055AB | CGB4B3X6S0J225M055AB | |
| | | | ±10% | | | | | CGB3B1X6S0G475K055AC |
| 4.7µF | 1608 | 0.55max. | ±20% | | | CGB3B1X6S0G475M055AC | | |

Class 2 (Temperature Stable)

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

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | | |
|-------------|------|----------------|-----------------------|------------------------|------------------------|-------------------------|-------------------------|
| | | | | Rated Voltage Edc: 16V | Rated Voltage Edc: 10V | Rated Voltage Edc: 6.3V | Rated Voltage Edc: 4.0V |
| 1 µF | 1608 | 0.55 max. | ± 10% | | CGB3B1X7R1A105K055AC | CGB3B3X7R0J105K055AB | |
| | | | ± 20% | | CGB3B1X7R1A105M055AC | CGB3B3X7R0J105M055AB | |
| 2.2 µF | 2012 | 0.55 max. | ± 10% | | CGB4B1X7R1A225K055AC | CGB4B3X7R0J225K055AB | |
| | | | ± 20% | | CGB4B1X7R1A225M055AC | CGB4B3X7R0J225M055AB | |

Class 2 (Temperature Stable)

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

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | | |
|-------------|------|----------------|-----------------------|------------------------|------------------------|-------------------------|-------------------------|
| | | | | Rated Voltage Edc: 16V | Rated Voltage Edc: 10V | Rated Voltage Edc: 6.3V | Rated Voltage Edc: 4.0V |
| 470 nF | 1005 | 0.33 max. | ± 10% | | | | CGB2A1X7S0G474K033BC |
| | | | ± 20% | | | | CGB2A1X7S0G474M033BC |
| 1 µF | 1005 | 0.33 max. | ± 10% | | | CGB2A1X7S0J105K033BC | CGB2A1X7S0G105K033BC |
| | | | ± 20% | | | CGB2A1X7S0J105M033BC | CGB2A1X7S0G105M033BC |
| 2.2 µF | 1608 | 0.55 max. | ± 10% | | | | CGB3B1X7S0G225K055AC |
| | | | ± 20% | | | | CGB3B1X7S0G225M055AC |