



**THE DATASHEET OF
C0816X7S0G105M050AC**



MULTILAYER CERAMIC CHIP CAPACITORS

Commercial grade, low ESL reverse geometry

C series

C0510 [EIA CC0204]

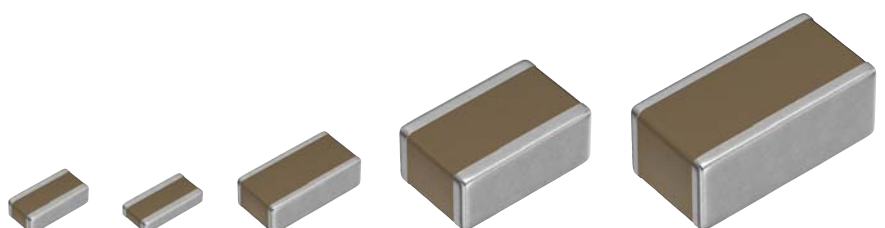
CGBD [EIA CC0204]

C0816 [EIA CC0306]

C1220 [EIA CC0508]

C1632 [EIA CC0612]

* 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 on this catalog are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.

The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property.

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 the each catalog, please contact us.

- | | |
|--|--|
| (1) Aerospace/aviation equipment | (8) Public information-processing equipment |
| (2) Transportation equipment (cars, 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.

- 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 |

C series

Low ESL reverse geometry



Type: C0510 [0204 inch], CGBD [0204 inch], C0816 [0306 inch], C1220 [0508 inch], C1632 [0612 inch]

SERIES OVERVIEW

TDK multilayer ceramic chip capacitor low ESL flip type commercial grade C series is a product which rotated the electrode direction 90 degrees vertically and horizontally compared to standard termination type. ESR, ESL and impedance are reduced by wider and shorter current route.

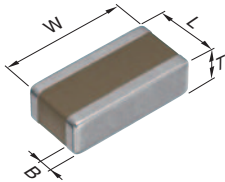
FEATURES

- Small and high-performance EMC components. Good attenuation characteristic in wide bandwidth.
- Very effective for the decoupling use. The number of decoupling MLCCs can be decreased because the impedance is lower than standard termination type.

APPLICATIONS

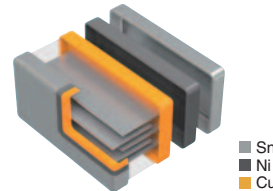
- EMC countermeasure and decoupling use in power lines for general electronic equipment.

SHAPE & DIMENSIONS



| | |
|---|----------------|
| L | Body length |
| W | Body width |
| T | Body height |
| B | Terminal width |

PRODUCT STRUCTURE



The current route becomes wider and shorter by the structure which rotated the electrode direction 90 degrees vertically and horizontally compared to standard termination type.

Dimensions in mm

| Type | L | W | T | B |
|-------|-----------|-----------|-----------|-----------|
| C0510 | 0.52±0.05 | 1.00±0.05 | 0.30±0.05 | 0.10 min. |
| CGBD | 0.52±0.05 | 1.00±0.05 | 0.22 max. | 0.10 min. |
| C0816 | 0.80±0.15 | 1.60±0.20 | 0.50±0.10 | 0.10 min. |
| C1220 | 1.25±0.20 | 2.00±0.20 | 0.85±0.15 | 0.20 min. |
| C1632 | 1.60±0.20 | 3.20±0.20 | 1.30±0.15 | 0.20 min. |

*Dimensional tolerances are typical values.

CATALOG NUMBER CONSTRUCTION

| | | | | | | | | |
|----------|-------------|------------|-----------|------------|----------|------------|----------|----------|
| C | 0510 | X7R | 1H | 473 | M | 030 | B | C |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |

(1) Series

(2) Dimensions L x W (mm)

| Dimensions code | EIA | Length | Width | Terminal width |
|-----------------|--------|--------|-------|----------------|
| 0510 | CC0204 | 0.52 | 1.00 | 0.10 |
| CGBD | CC0204 | 0.52 | 1.00 | 0.10 |
| 0816 | CC0306 | 0.80 | 1.60 | 0.10 |
| 1220 | CC0508 | 1.25 | 2.00 | 0.20 |
| 1632 | CC0612 | 1.60 | 3.20 | 0.20 |

(3) Temperature characteristics

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| X5R | ±15% | -55 to +85°C |
| X6S | ±22% | -55 to +105°C |
| X7R | ±15% | -55 to +125°C |
| X7S | ±22% | -55 to +125°C |
| X7T | +22,-33% | -55 to +125°C |

(4) Rated voltage (DC)

| Code | Voltage (DC) |
|------|--------------|
| 0E | 2.5V |
| 0G | 4V |
| 0J | 6.3V |
| 1A | 10V |
| 1C | 16V |
| 1E | 25V |
| 1H | 50V |

(5) 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 = 0.5pF

101 = 100pF

225 = 2,200,000pF = 2.2μF

(6) Capacitance tolerance

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

(7) Thickness

| Code | Thickness |
|------|-----------|
| 022 | 0.22mm |
| 030 | 0.30mm |
| 050 | 0.50mm |
| 070 | 0.70mm |
| 085 | 0.85mm |
| 115 | 1.15mm |
| 130 | 1.30mm |

(8) Packaging style

| Code | Style |
|------|-----------------------|
| A | 178mm reel, 4mm pitch |
| B | 178mm reel, 2mm pitch |

(9) Special reserved code

| Code | Description |
|------|-------------------|
| A, C | TDK internal code |

Capacitance range chart

C0510 [0204 inch]

| Capacitance | | X5R | | | X6S | | X7R | | X7S | |
|-------------|------|-------------|-------------|--------------|--------------|------------|-------------|-------------|------------|--------------|
| (pF) | Code | 1C (16V) | 1A (10V) | 0J (6.3V) | 0J (6.3V) | 0G (4V) | 1H (50V) | 1E (25V) | 0G (4V) | 0E (2.5V) |
| 47,000 | 473 | | | | | | | | | |
| 100,000 | 104 | | | | | | | | | |
| 220,000 | 224 | | | | | | | | | |
| 470,000 | 474 | | | | | | | | | |
| 1,000,000 | 105 | | | | | | | | | |

Standard thickness 0.30 mm

■ Please refer to the capacitance range table at P-7 and after for the details such as product thickness and capacitance tolerance.

Capacitance range chart

CGBD/0510 [0204 inch]

| Capacitance | | X5R | X6S | X7T |
|-------------|------|------------|------------|--------------|
| (pF) | Code | 0G (4V) | 0G (4V) | 0E (2.5V) |
| 1,000,000 | 105 | | | |

Standard thickness 0.22 mm max.

■ Please refer to the capacitance range table at P-7 and after for the details such as product thickness and capacitance tolerance.

Capacitance range chart

C0816 [0306 inch]

| Capacitance | | X5R | | | X6S | X7R | | X7S |
|-------------|------|-------------|-------------|--------------|------------|-------------|--------------|------------|
| (pF) | Code | 1C (16V) | 1A (10V) | 0J (6.3V) | 0G (4V) | 1C (16V) | 0J (6.3V) | 0G (4V) |
| 10,000 | 103 | | | | | | | |
| 22,000 | 223 | | | | | | | |
| 47,000 | 473 | | | | | | | |
| 100,000 | 104 | | | | | | | |
| 220,000 | 224 | | | | | | | |
| 470,000 | 474 | | | | | | | |
| 1,000,000 | 105 | | | | | | | |
| 2,200,000 | 225 | | | | | | | |
| 4,700,000 | 475 | | | | | | | |

Standard thickness 0.50 mm

Background red: The product which is planning to stop production

■ Please refer to the capacitance range table at P-7 and after for the details such as product thickness and capacitance tolerance.

Capacitance range chart

C1220 [0508 inch]

| Capacitance | | X5R | | | | X7R | | | |
|-------------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| (pF) | Code | 1H (50V) | 1E (25V) | 1C (16V) | 1A (10V) | 1H (50V) | 1E (25V) | 1C (16V) | 0J (6.3V) |
| 10,000 | 103 | | | | | | | | |
| 22,000 | 223 | | | | | | | | |
| 47,000 | 473 | | | | | | | | |
| 100,000 | 104 | | | | | | | | |
| 220,000 | 224 | | | | | | | | |
| 470,000 | 474 | | | | | | | | |
| 1,000,000 | 105 | | | | | | | | |

Standard thickness 0.85 mm

Background red: The product which is planning to stop production

■ Please refer to the capacitance range table at P-7 and after for the details such as product thickness and capacitance tolerance.

Capacitance range chart

C1632 [0612 inch]

| Capacitance | | X5R | | | | | X7R | | | | | X7S |
|-------------|------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|------------|
| (pF) | Code | 1H (50V) | 1E (25V) | 1C (16V) | 1A (10V) | 0J (6.3V) | 1H (50V) | 1E (25V) | 1C (16V) | 1A (10V) | 0J (6.3V) | 0G (4V) |
| 10,000 | 103 | | | | | | | | | | | |
| 22,000 | 223 | | | | | | | | | | | |
| 47,000 | 473 | | | | | | | | | | | |
| 100,000 | 104 | | | | | | | | | | | |
| 220,000 | 224 | | | | | | | | | | | |
| 470,000 | 474 | | | | | | | | | | | |
| 1,000,000 | 105 | | | | | | | | | | | |
| 2,200,000 | 225 | | | | | | | | | | | |
| 4,700,000 | 475 | | | | | | | | | | | |
| 10,000,000 | 106 | | | | | | | | | | | |

Standard thickness 0.70 mm 1.15 mm 1.30 mm

Background red: The product which is planning to stop production

■ Please refer to the capacitance range table at P-7 and after for the details such as product thickness and capacitance tolerance.

Capacitance range table

Temperature characteristics: X5R (–55 to 85°C, ±15%)

| Capacitance | Dimensions | Thickness (mm) | Capacitance tolerance | Catalog number | | | |
|-------------|------------|----------------|-----------------------|------------------------|------------------------|------------------------|------------------------|
| | | | | Rated voltage Edc: 50V | Rated voltage Edc: 25V | Rated voltage Edc: 16V | Rated voltage Edc: 10V |
| 10nF | 0816 | 0.50±0.10 | ±20% | | | C0816X5R1C103M050AC | |
| | 1220 | 0.85±0.15 | ±20% | C1220X5R1H103M085AC | | | |
| | 1632 | 0.70±0.10 | ±20% | C1632X5R1H103M070AC | | | |
| 22nF | 0816 | 0.50±0.10 | ±20% | | | C0816X5R1C223M050AC | |
| | 1220 | 0.85±0.15 | ±20% | C1220X5R1H223M085AC | | | |
| | 1632 | 0.70±0.10 | ±20% | C1632X5R1H223M070AC | | | |
| 47nF | 0816 | 0.50±0.10 | ±20% | | | C0816X5R1C473M050AC | |
| | 1220 | 0.85±0.15 | ±20% | C1220X5R1H473M085AC | | | |
| | 1632 | 0.70±0.10 | ±20% | C1632X5R1H473M070AC | | | |
| 100nF | 0510 | 0.30±0.05 | ±20% | | | | C0510X5R1C104M030BC |
| | 0816 | 0.50±0.10 | ±20% | | | | C0816X5R1C104M050AC |
| | 1220 | 0.85±0.15 | ±20% | | C1220X5R1E104M085AC | | |
| | 1632 | 0.70±0.10 | ±20% | C1632X5R1H104M070AC | | | |
| 220nF | 0816 | 0.50±0.10 | ±20% | | | | C0816X5R1A224M050AC |
| | 1220 | 0.85±0.15 | ±20% | | | C1220X5R1C224M085AC | |
| | 1632 | 0.70±0.10 | ±20% | | C1632X5R1E224M070AC | | |
| | | 1.15±0.15 | ±20% | C1632X5R1H224M115AC | | | |
| 470nF | 0510 | 0.30±0.05 | ±20% | | | C0510X5R1C474M030BC | C0510X5R1A474M030BC |
| | 0816 | 0.50±0.10 | ±20% | | | | C0816X5R1A474M050AC |
| | 1220 | 0.85±0.15 | ±20% | | | | C1220X5R1A474M085AC |
| | 1632 | 0.70±0.10 | ±20% | | | C1632X5R1C474M070AC | |
| | | 1.15±0.15 | ±20% | | C1632X5R1E474M115AC | | |
| 1µF | 0816 | 0.50±0.10 | ±20% | | | C0816X5R1C105M050AC | |
| | 1220 | 0.85±0.15 | ±20% | | | | C1220X5R1A105M085AC |
| | 1632 | 0.70±0.10 | ±20% | | | | C1632X5R1A105M070AC |
| | | 1.15±0.15 | ±20% | | | C1632X5R1C105M115AC | |
| 2.2µF | 1632 | 1.15±0.15 | ±20% | | | | C1632X5R1A225M115AC |

■ The red items are products which the production will be stopped.

| Capacitance | Dimensions | Thickness (mm) | Capacitance tolerance | Catalog number | |
|-------------|------------|----------------|-----------------------|-------------------------|-------------------------|
| | | | | Rated voltage Edc: 6.3V | Rated voltage Edc: 4.0V |
| 470 nF | 0816 | 0.50±0.10 | ±20% | C0816X5R0J474M050AC | |
| 1 µF | 0510 | 0.30±0.05 | ±20% | C0510X5R0J105M030BC | |
| | | 0.22max. | ±20% | | CGBDT1X5R0G105M022BC |
| 2.2 µF | 0816 | 0.50±0.10 | ±20% | C0816X5R0J105M050AC | |
| 4.7 µF | 0816 | 0.50±0.10 | ±20% | C0816X5R0J475M050AC | |
| | 1632 | 1.30±0.15 | ±20% | C1632X5R0J475M130AC | |
| 10 µF | 1632 | 1.30±0.15 | ±20% | C1632X5R0J106M130AC | |

■ The red items are products which the production will be stopped.

Capacitance range table

Temperature characteristics: X6S (–55 to 105°C, ±22%)

| Capacitance | Dimensions | Thickness (mm) | Capacitance tolerance | Catalog number | |
|-------------|------------|----------------|-----------------------|-------------------------|-------------------------|
| | | | | Rated voltage Edc: 6.3V | Rated voltage Edc: 4.0V |
| 100 nF | 0510 | 0.30±0.05 | ±20% | | C0510X6S0G104M030BC |
| 220 nF | 0510 | 0.30±0.05 | ±20% | | C0510X6S0G224M030BC |
| 470 nF | 0510 | 0.30±0.05 | ±20% | C0510X6S0J474M030BC | C0510X6S0G474M030BC |
| | | 0.30±0.05 | ±20% | | C0510X6S0G105M030BC |
| 1 µF | 0510 | 0.22max. | ±20% | | CGBDT1X6S0G105M022BC |
| | 0816 | 0.50±0.10 | ±20% | | C0816X6S0G475M050AC |

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance range table

Temperature characteristics: X7R (–55 to 125°C, ±15%)

| Capacitance | Dimensions | Thickness (mm) | Capacitance tolerance | Catalog number | | | |
|-------------|------------|----------------|-----------------------|------------------------|------------------------|------------------------|------------------------|
| | | | | Rated voltage Edc: 50V | Rated voltage Edc: 25V | Rated voltage Edc: 16V | Rated voltage Edc: 10V |
| 10nF | 0816 | 0.50±0.10 | ±20% | | | C0816X7R1C103M050AC | |
| | 1220 | 0.85±0.15 | ±20% | C1220X7R1H103M085AC | | | |
| | 1632 | 0.70±0.10 | ±20% | C1632X7R1H103M070AC | | | |
| 22nF | 0816 | 0.50±0.10 | ±20% | | | C0816X7R1C223M050AC | |
| | 1220 | 0.85±0.15 | ±20% | C1220X7R1H223M085AC | | | |
| | 1632 | 0.70±0.10 | ±20% | C1632X7R1H223M070AC | | | |
| 47nF | 0510 | 0.30±0.05 | ±20% | C0510X7R1H473M030BC | C0510X7R1E473M030BA | | |
| | 0816 | 0.50±0.10 | ±20% | | | C0816X7R1C473M050AC | |
| | 1220 | 0.85±0.15 | ±20% | C1220X7R1H473M085AC | | | |
| | 1632 | 0.70±0.10 | ±20% | C1632X7R1H473M070AC | | | |
| 100nF | 0816 | 0.50±0.10 | ±20% | | | C0816X7R1C104M050AC | |
| | 1220 | 0.85±0.15 | ±20% | | C1220X7R1E104M085AC | | |
| | 1632 | 0.70±0.10 | ±20% | C1632X7R1H104M070AC | | | |
| 220nF | 1220 | 0.85±0.15 | ±20% | | | C1220X7R1C224M085AC | |
| | 1632 | 0.70±0.10 | ±20% | | C1632X7R1E224M070AC | | |
| 470nF | 1632 | 1.15±0.15 | ±20% | C1632X7R1H224M115AC | | | |
| | | 0.70±0.10 | ±20% | | | C1632X7R1C474M070AC | |
| | | 1.15±0.15 | ±20% | | C1632X7R1E474M115AC | | |
| 1µF | 1632 | 0.70±0.10 | ±20% | | | | C1632X7R1A105M070AC |
| | | 1.15±0.15 | ±20% | | | C1632X7R1C105M115AC | |
| 2.2µF | 1632 | 1.15±0.15 | ±20% | | | | C1632X7R1A225M115AC |

■ The red items are products which the production will be stopped.

| Capacitance | Dimensions | Thickness (mm) | Capacitance tolerance | Catalog number |
|-------------|------------|----------------|-----------------------|-------------------------|
| | | | | Rated voltage Edc: 6.3V |
| 220nF | 0816 | 0.50±0.10 | ±20% | C0816X7R0J224M050AC |
| 470nF | 1220 | 0.85±0.15 | ±20% | C1220X7R0J474M085AC |
| 1µF | 1220 | 0.85±0.15 | ±20% | C1220X7R0J105M085AC |
| | 1632 | 0.70±0.10 | ±20% | C1632X7R0J105M070AC |
| 2.2µF | 1632 | 1.15±0.15 | ±20% | C1632X7R0J225M115AC |

■ The red items are products which the production will be stopped.

Capacitance range table

Temperature characteristics: X7S (–55 to 125°C, ±22%)

| Capacitance | Dimensions | Thickness (mm) | Capacitance tolerance | Catalog number | |
|-------------|------------|----------------|-----------------------|-------------------------|-------------------------|
| | | | | Rated voltage Edc: 4.0V | Rated voltage Edc: 2.5V |
| 470nF | 0510 | 0.30±0.05 | ±20% | C0510X7S0G474M030BC | |
| | 0816 | 0.50±0.10 | ±20% | C0816X7S0G474M050AC | |
| 1µF | 0510 | 0.30±0.05 | ±20% | | C0510X7S0E105M030BC |
| | 0816 | 0.50±0.10 | ±20% | C0816X7S0G105M050AC | |
| 2.2µF | 0816 | 0.50±0.10 | ±20% | C0816X7S0G225M050AC | |
| 4.7µF | 1632 | 1.30±0.15 | ±20% | C1632X7S0G475M130AC | |
| 10µF | 1632 | 1.30±0.15 | ±20% | C1632X7S0G106M130AC | |

■ The red items are products which the production will be stopped.

Capacitance range table

Temperature characteristics: X7T (–55 to 125°C, +22, –33%)

| Capacitance | Dimensions | Thickness (mm) | Capacitance tolerance | Catalog number |
|-------------|------------|----------------|-----------------------|-------------------------|
| | | | | Rated voltage Edc: 2.5V |
| 1µF | 0510 | 0.22 max. | ±20% | CGBDT1X7T0E105M022BC |

⚠ 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.

Looking for pricing, stock, or lifecycle information?

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