

# MULTILAYER CERAMIC CHIP CAPACITORS

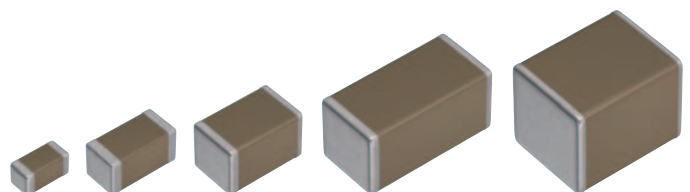
Automotive grade, conductive epoxy application

## CGA series

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|             |                         |
|-------------|-------------------------|
| <b>CGA2</b> | <b>1005 [0402 inch]</b> |
| <b>CGA3</b> | <b>1608 [0603 inch]</b> |
| <b>CGA4</b> | <b>2012 [0805 inch]</b> |
| <b>CGA5</b> | <b>3216 [1206 inch]</b> |
| <b>CGA6</b> | <b>3225 [1210 inch]</b> |

\* 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 in this specification are intended for use in automotive applications under normal operation and usage conditions. The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality requires a more stringent level of safety or reliability, or whose failure, malfunction or defect could cause serious damage to society, person or property.

Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below or for any other use exceeding the range or conditions set forth in this specification sheet. 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 this specification, please contact us.

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

In addition, although the products listed in this specification are intended for use in automotive applications as described above, they are not prohibited to use in general electronic equipment, whose performance and/or quality doesn't require a more stringent level of safety or reliability, or whose failure, malfunction or defect could not cause serious damage to society, person or property. Therefore, the description of this caution will be applied, when the products are used in general electronic equipment under a normal operation and usage conditions.

- 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                  |

# CGA series

## Conductive epoxy application



Type: CGA2/1005 [0402 inch], CGA3/1608 [0603 inch], CGA4/2012 [0805 inch],  
CGA5/3216 [1206 inch], CGA6/3225 [1210 inch]

### SERIES OVERVIEW

Conductive epoxy application CGA series, automotive grade of TDK's multilayer ceramic chip capacitor, is a product for conductive glue mounting, not for solder mounting. The risk of silver migration is reduced due to AgPdCu termination. The maximum operating temperature is 150°C and the capacitance range is up to 10 $\mu$ F.

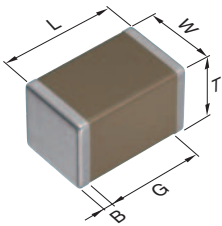
### FEATURES

- The risk of silver migration is reduced due to AgPdCu termination.
- The maximum operating temperature is 150°C (X8R).
- COG temperature characteristic which has excellent stable temperature and DC-bias characteristics is available.
- AEC-Q200 compliant.

### APPLICATIONS

- For only conductive glue mounting, not for solder mounting.
- ABS, transmission, engine sensors, etc.

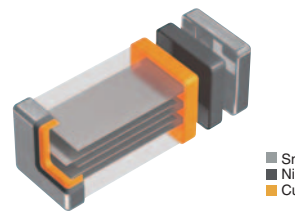
### SHAPE & DIMENSIONS



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

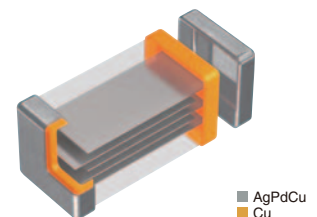
### PRODUCT STRUCTURE

General type



Termination consists of 3 layers by Cu, Ni and Sn.

Conductive epoxy type



The risk of silver migration is reduced due to AgPdCu termination.

Dimensions in mm

| Type | L               | W               | T               | B        | G        |
|------|-----------------|-----------------|-----------------|----------|----------|
| CGA2 | 1.00±0.15       | 0.50±0.10       | 0.50±0.10       | 0.10min. | 0.30min. |
| CGA3 | 1.60±0.15       | 0.80±0.15       | 0.80±0.15       | 0.20min. | 0.30min. |
| CGA4 | 2.00±0.25       | 1.25±0.25       | 1.25±0.25       | 0.20min. | 0.50min. |
| CGA5 | 3.20+0.30,-0.10 | 1.60+0.30,-0.10 | 1.60+0.30,-0.10 | 0.20min. | 1.00min. |
| CGA6 | 3.20±0.45       | 2.50±0.30       | 2.50±0.30       | 0.20min. | —        |

\*Dimensional tolerances are typical values.

**CATALOG NUMBER CONSTRUCTION**

|            |          |          |          |            |           |            |          |            |          |          |
|------------|----------|----------|----------|------------|-----------|------------|----------|------------|----------|----------|
| <b>CGA</b> | <b>6</b> | <b>P</b> | <b>1</b> | <b>X8R</b> | <b>1E</b> | <b>106</b> | <b>K</b> | <b>250</b> | <b>A</b> | <b>D</b> |
| (1)        | (2)      | (3)      | (4)      | (5)        | (6)       | (7)        | (8)      | (9)        | (10)     | (11)     |

## (1) Series

## (2) Dimensions L x W (mm)

| Code | EIA    | Length | Width | Terminal width |
|------|--------|--------|-------|----------------|
| 2    | CC0402 | 1.00   | 0.50  | 0.10           |
| 3    | CC0603 | 1.60   | 0.80  | 0.20           |
| 4    | CC0805 | 2.00   | 1.25  | 0.20           |
| 5    | CC1206 | 3.20   | 1.60  | 0.20           |
| 6    | CC1210 | 3.20   | 2.50  | 0.20           |

## (3) Thickness code

| Code | Thickness |
|------|-----------|
| B    | 0.50mm    |
| C    | 0.60mm    |
| E    | 0.80mm    |
| F    | 0.85mm    |
| H    | 1.15mm    |
| J    | 1.25mm    |
| L    | 1.60mm    |
| M    | 2.00mm    |
| P    | 2.50mm    |

## (4) Voltage condition for life test

| Symbol | Condition  |
|--------|------------|
| 1      | 1 × R.V.   |
| 2      | 2 × R.V.   |
| 3      | 1.5 × R.V. |

## (5) 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     |
| X8R                         | ±15%  | -55 to +150°C     |

## (6) Rated voltage (DC)

| Code | Voltage (DC) |
|------|--------------|
| 0J   | 6.3V         |
| 1C   | 16V          |
| 1E   | 25V          |
| 1V   | 35V          |
| 1H   | 50V          |
| 2A   | 100V         |

## (7) 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

## (8) Capacitance tolerance

| Code | Tolerance |
|------|-----------|
| C    | ±0.25pF   |
| D    | ±0.50pF   |
| J    | ±5%       |
| K    | ±10%      |
| M    | ±20%      |

## (9) Thickness

| Code | Thickness |
|------|-----------|
| 050  | 0.50mm    |
| 060  | 0.60mm    |
| 080  | 0.80mm    |
| 085  | 0.85mm    |
| 115  | 1.15mm    |
| 125  | 1.25mm    |
| 160  | 1.60mm    |
| 200  | 2.00mm    |
| 250  | 2.50mm    |

## (10) Packaging style

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

## (11) Special reserved code

| Code | Description                  |
|------|------------------------------|
| D    | Conductive epoxy application |

MULTILAYER CERAMIC CHIP CAPACITORS TDK

Capacitance range chart

CGA2/1005 [0402 inch]

| Capacitance |      | COG<br>1H<br>(50V) | X7R         |             |             | X8R         |             |             |
|-------------|------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| (pF)        | Code |                    | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) |
| 1           | 010  | █                  |             |             |             |             |             |             |
| 1.5         | 1R5  | █                  |             |             |             |             |             |             |
| 2           | 020  | █                  |             |             |             |             |             |             |
| 2.2         | 2R2  | █                  |             |             |             |             |             |             |
| 3           | 030  | █                  |             |             |             |             |             |             |
| 3.3         | 3R3  | █                  |             |             |             |             |             |             |
| 4           | 040  | █                  |             |             |             |             |             |             |
| 4.7         | 4R7  | █                  |             |             |             |             |             |             |
| 5           | 050  | █                  |             |             |             |             |             |             |
| 6           | 060  | █                  |             |             |             |             |             |             |
| 6.8         | 6R8  | █                  |             |             |             |             |             |             |
| 7           | 070  | █                  |             |             |             |             |             |             |
| 8           | 080  | █                  |             |             |             |             |             |             |
| 9           | 090  | █                  |             |             |             |             |             |             |
| 10          | 100  | █                  |             |             |             |             |             |             |
| 12          | 120  | █                  |             |             |             |             |             |             |
| 15          | 150  | █                  |             |             |             |             |             |             |
| 18          | 180  | █                  |             |             |             |             |             |             |
| 22          | 220  | █                  |             |             |             |             |             |             |
| 27          | 270  | █                  |             |             |             |             |             |             |
| 33          | 330  | █                  |             |             |             |             |             |             |
| 39          | 390  | █                  |             |             |             |             |             |             |
| 47          | 470  | █                  |             |             |             |             |             |             |
| 56          | 560  | █                  |             |             |             |             |             |             |
| 68          | 680  | █                  |             |             |             |             |             |             |
| 82          | 820  | █                  |             |             |             |             |             |             |
| 100         | 101  | █                  |             |             |             |             |             |             |
| 120         | 121  | █                  |             |             |             | █           |             |             |
| 150         | 151  | █                  |             |             |             | █           |             |             |
| 180         | 181  | █                  |             |             |             | █           |             |             |
| 220         | 221  | █                  |             |             |             | █           |             |             |
| 270         | 271  | █                  |             |             |             | █           |             |             |
| 330         | 331  | █                  |             |             |             | █           |             |             |
| 390         | 391  | █                  |             |             |             | █           |             |             |
| 470         | 471  | █                  |             |             |             | █           |             |             |
| 560         | 561  | █                  |             |             |             | █           |             |             |
| 680         | 681  | █                  |             |             |             | █           |             |             |
| 820         | 821  | █                  |             |             |             | █           |             |             |
| 1,000       | 102  | █                  |             |             |             | █           |             |             |
| 1,500       | 152  |                    |             |             |             | █           |             |             |
| 2,200       | 222  |                    |             |             |             | █           |             |             |
| 3,300       | 332  |                    |             |             |             | █           |             |             |
| 4,700       | 472  |                    |             |             |             | █           |             |             |
| 6,800       | 682  |                    |             |             |             | █           |             |             |
| 10,000      | 103  |                    | █           |             |             | █           | █           |             |
| 15,000      | 153  |                    | █           | █           |             | █           | █           |             |
| 22,000      | 223  |                    | █           | █           | █           | █           | █           |             |
| 33,000      | 333  |                    | █           | █           | █           | █           | █           | █           |
| 47,000      | 473  |                    | █           | █           | █           | █           | █           | █           |
| 68,000      | 683  |                    | █           | █           |             | █           | █           |             |
| 100,000     | 104  |                    | █           | █           |             | █           | █           |             |

Standard thickness  0.50mm

Background gray: The product which is not recommended to a new design.



█ Please refer to the capacitance range table at P-10 and after for the details such as product thickness and capacitance tolerance.

⚠ 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.

## Capacitance range chart

CGA3/1608 [0603 inch]

| Capacitance |      | C0G          |             | X7R         | X8R          |             |
|-------------|------|--------------|-------------|-------------|--------------|-------------|
| (pF)        | Code | 2A<br>(100V) | 1H<br>(50V) | 1H<br>(50V) | 2A<br>(100V) | 1H<br>(50V) |
| 1           | 010  |              |             |             |              |             |
| 1.5         | 1R5  |              |             |             |              |             |
| 2           | 020  |              |             |             |              |             |
| 2.2         | 2R2  |              |             |             |              |             |
| 3           | 030  |              |             |             |              |             |
| 3.3         | 3R3  |              |             |             |              |             |
| 4           | 040  |              |             |             |              |             |
| 4.7         | 4R7  |              |             |             |              |             |
| 5           | 050  |              |             |             |              |             |
| 6           | 060  |              |             |             |              |             |
| 6.8         | 6R8  |              |             |             |              |             |
| 7           | 070  |              |             |             |              |             |
| 8           | 080  |              |             |             |              |             |
| 9           | 090  |              |             |             |              |             |
| 10          | 100  |              |             |             |              |             |
| 12          | 120  |              |             |             |              |             |
| 15          | 150  |              |             |             |              |             |
| 18          | 180  |              |             |             |              |             |
| 22          | 220  |              |             |             |              |             |
| 27          | 270  |              |             |             |              |             |
| 33          | 330  |              |             |             |              |             |
| 39          | 390  |              |             |             |              |             |
| 47          | 470  |              |             |             |              |             |
| 56          | 560  |              |             |             |              |             |
| 68          | 680  |              |             |             |              |             |
| 82          | 820  |              |             |             |              |             |
| 100         | 101  |              |             |             |              |             |
| 120         | 121  |              |             |             |              |             |
| 150         | 151  |              |             |             |              |             |
| 180         | 181  |              |             |             |              |             |
| 220         | 221  |              |             |             |              |             |
| 270         | 271  |              |             |             |              |             |
| 330         | 331  |              |             |             |              |             |
| 390         | 391  |              |             |             |              |             |
| 470         | 471  |              |             |             |              |             |
| 560         | 561  |              |             |             |              |             |
| 680         | 681  |              |             |             |              |             |
| 820         | 821  |              |             |             |              |             |
| 1000        | 102  |              |             |             |              |             |
| 1200        | 122  |              |             |             |              |             |
| 1500        | 152  |              |             |             |              |             |
| 1800        | 182  |              |             |             |              |             |
| 2200        | 222  |              |             |             |              |             |
| 2700        | 272  |              |             |             |              |             |
| 3300        | 332  |              |             |             |              |             |
| 3900        | 392  |              |             |             |              |             |
| 4700        | 472  |              |             |             |              |             |
| 5600        | 562  |              |             |             |              |             |
| 6800        | 682  |              |             |             |              |             |
| 8200        | 822  |              |             |             |              |             |
| 10000       | 103  |              |             |             |              |             |



Standard thickness  0.80mm Background gray: The product which is not recommended to a new design.

■ Please refer to the capacitance range table at P-10 and after for the details such as product thickness and capacitance tolerance.

## Capacitance range chart

CGA3/1608 [0603 inch]

| Capacitance |      | X7R         |             |             |             | X8R          |             |             |             |
|-------------|------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|
| (pF)        | Code | 1H<br>(50V) | 1V<br>(35V) | 1E<br>(25V) | 1C<br>(16V) | 2A<br>(100V) | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) |
| 15000       | 153  | ■           |             |             |             | ■            | ■           |             |             |
| 22000       | 223  | ■           |             |             |             |              | ■           |             |             |
| 33000       | 333  | ■           |             |             |             | ■            | ■           |             |             |
| 47000       | 473  | ■           |             |             |             |              | ■           |             |             |
| 68000       | 683  | ■           |             |             |             |              | ■           | ■           |             |
| 100000      | 104  | ■           |             |             |             |              | ■           | ■           |             |
| 150000      | 154  | ■           |             | ■           |             |              |             |             |             |
| 220000      | 224  | ■           |             | ■           | ■           |              |             |             |             |
| 330000      | 334  | ■           | ■           | ■           |             |              |             | ■           | ■           |
| 470000      | 474  | ■           | ■           | ■           |             |              |             |             | ■           |
| 680000      | 684  | ■           |             | ■           |             |              |             |             |             |
| 1000000     | 105  | ■           |             | ■           |             |              |             |             |             |

Standard thickness  0.80mm Background gray: The product which is not recommended to a new design.

■ Please refer to the capacitance range table at P-10 and after for the details such as product thickness and capacitance tolerance.

MULTILAYER CERAMIC CHIP CAPACITORS TDK

Capacitance range chart

CGA4/2012 [0805 inch]

| Capacitance |      | C0G      | X7R      |          |          |           | X8R       |          |          |          |
|-------------|------|----------|----------|----------|----------|-----------|-----------|----------|----------|----------|
| (pF)        | Code | 1H (50V) | 1H (50V) | 1E (25V) | 1C (16V) | 0J (6.3V) | 2A (100V) | 1H (50V) | 1E (25V) | 1C (16V) |
| 2,700       | 272  | █        |          |          |          |           |           |          |          |          |
| 3,300       | 332  | █        |          |          |          |           |           |          |          |          |
| 3,900       | 392  | █        |          |          |          |           |           |          |          |          |
| 4,700       | 472  | █        |          |          |          |           |           |          |          |          |
| 5,600       | 562  | █        |          |          |          |           |           |          |          |          |
| 6,800       | 682  | █        |          |          |          |           |           |          |          |          |
| 8,200       | 822  | █        |          |          |          |           |           |          |          |          |
| 10,000      | 103  | █        |          |          |          |           | █         |          |          |          |
| 15,000      | 153  | █        |          |          |          |           | █         |          |          |          |
| 22,000      | 223  | █        |          |          |          |           | █         |          |          |          |
| 33,000      | 333  | █        |          |          |          |           | █         |          |          |          |
| 47,000      | 473  |          |          |          |          |           |           |          |          |          |
| 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  |          |          | █        | █        |           |           |          |          | █        |
| 6,800,000   | 685  |          |          | █        | █        | █         |           |          |          | █        |
| 10,000,000  | 106  |          |          | █        | █        | █         |           |          |          | █        |

Standard thickness    █ 0.60 mm    █ 0.85 mm    █ 1.25 mm

█ Background gray: The product which is not recommended to a new design.

█ Please refer to the capacitance range table at P-10 and after for the details such as product thickness and capacitance tolerance.

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MULTILAYER CERAMIC CHIP CAPACITORS TDK

Capacitance range chart

CGA5/3216 [1206 inch]

| Capacitance |      | COG      | X7R      |          |          |           | X8R      |          |          |  |
|-------------|------|----------|----------|----------|----------|-----------|----------|----------|----------|--|
| (pF)        | Code | 1H (50V) | 1H (50V) | 1E (25V) | 1C (16V) | 2A (100V) | 1H (50V) | 1E (25V) | 1C (16V) |  |
| 4,700       | 472  | █        |          |          |          |           |          |          |          |  |
| 5,600       | 562  | █        |          |          |          |           |          |          |          |  |
| 6,800       | 682  | █        |          |          |          |           |          |          |          |  |
| 8,200       | 822  | █        |          |          |          |           |          |          |          |  |
| 10,000      | 103  | █        |          |          |          |           |          |          |          |  |
| 15,000      | 153  | █        |          |          |          |           |          |          |          |  |
| 22,000      | 223  | █        |          |          |          |           |          |          |          |  |
| 33,000      | 333  | █        |          |          |          | █         |          |          |          |  |
| 47,000      | 473  | █        |          |          |          | █         |          |          |          |  |
| 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  |          |          |          | █        |           | █        |          | █        |  |
| 6,800,000   | 685  |          |          | █        |          |           | █        |          | █        |  |
| 10,000,000  | 106  |          |          | █        |          |           | █        |          | █        |  |

Standard thickness █ 0.60 mm █ 0.85 mm █ 1.15 mm █ 1.60 mm

Background gray: The product which is not recommended to a new design.

█ Please refer to the capacitance range table at P-10 and after for the details such as product thickness and capacitance tolerance.

Capacitance range chart

CGA6/3225 [1210 inch]

| Capacitance |      | X7R      |          | X8R       |          |          |
|-------------|------|----------|----------|-----------|----------|----------|
| (pF)        | Code | 1H (50V) | 1E (25V) | 2A (100V) | 1E (25V) | 1C (16V) |
| 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  |          |          |           | █        | █        |

Standard thickness █ 1.60 mm █ 2.00 mm █ 2.50 mm

█ Please refer to the capacitance range table at P-10 and after for the details such as product thickness and capacitance tolerance.

⚠ 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.

## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

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

| Capacitance | Dimensions | Thickness (mm) | Capacitance tolerance | Catalog number          |                        |
|-------------|------------|----------------|-----------------------|-------------------------|------------------------|
|             |            |                |                       | Rated voltage Edc: 100V | Rated voltage Edc: 50V |
| 1pF         | 1005       | 0.50±0.10      | ±0.25pF               |                         | CGA2B2C0G1H010C050BD   |
|             | 1608       | 0.80±0.15      | ±0.25pF               | CGA3E2C0G2A010C080AD    | CGA3E2C0G1H010C080AD   |
| 1.5pF       | 1005       | 0.50±0.10      | ±0.25pF               |                         | CGA2B2C0G1H1R5C050BD   |
|             | 1608       | 0.80±0.15      | ±0.25pF               | CGA3E2C0G2A1R5C080AD    | CGA3E2C0G1H1R5C080AD   |
| 2pF         | 1005       | 0.50±0.10      | ±0.25pF               |                         | CGA2B2C0G1H020C050BD   |
|             | 1608       | 0.80±0.15      | ±0.25pF               | CGA3E2C0G2A020C080AD    | CGA3E2C0G1H020C080AD   |
| 2.2pF       | 1005       | 0.50±0.10      | ±0.25pF               |                         | CGA2B2C0G1H2R2C050BD   |
|             | 1608       | 0.80±0.15      | ±0.25pF               | CGA3E2C0G2A2R2C080AD    | CGA3E2C0G1H2R2C080AD   |
| 3pF         | 1005       | 0.50±0.10      | ±0.25pF               |                         | CGA2B2C0G1H030C050BD   |
|             | 1608       | 0.80±0.15      | ±0.25pF               | CGA3E2C0G2A030C080AD    | CGA3E2C0G1H030C080AD   |
| 3.3pF       | 1005       | 0.50±0.10      | ±0.25pF               |                         | CGA2B2C0G1H3R3C050BD   |
|             | 1608       | 0.80±0.15      | ±0.25pF               | CGA3E2C0G2A3R3C080AD    | CGA3E2C0G1H3R3C080AD   |
| 4pF         | 1005       | 0.50±0.10      | ±0.25pF               |                         | CGA2B2C0G1H040C050BD   |
|             | 1608       | 0.80±0.15      | ±0.25pF               | CGA3E2C0G2A040C080AD    | CGA3E2C0G1H040C080AD   |
| 4.7pF       | 1005       | 0.50±0.10      | ±0.25pF               |                         | CGA2B2C0G1H4R7C050BD   |
|             | 1608       | 0.80±0.15      | ±0.25pF               | CGA3E2C0G2A4R7C080AD    | CGA3E2C0G1H4R7C080AD   |
| 5pF         | 1005       | 0.50±0.10      | ±0.25pF               |                         | CGA2B2C0G1H050C050BD   |
|             | 1608       | 0.80±0.15      | ±0.25pF               | CGA3E2C0G2A050C080AD    | CGA3E2C0G1H050C080AD   |
| 6pF         | 1005       | 0.50±0.10      | ±0.50pF               |                         | CGA2B2C0G1H060D050BD   |
|             | 1608       | 0.80±0.15      | ±0.50pF               | CGA3E2C0G2A060D080AD    | CGA3E2C0G1H060D080AD   |
| 6.8pF       | 1005       | 0.50±0.10      | ±0.50pF               |                         | CGA2B2C0G1H6R8D050BD   |
|             | 1608       | 0.80±0.15      | ±0.50pF               | CGA3E2C0G2A6R8D080AD    | CGA3E2C0G1H6R8D080AD   |
| 7pF         | 1005       | 0.50±0.10      | ±0.50pF               |                         | CGA2B2C0G1H070D050BD   |
|             | 1608       | 0.80±0.15      | ±0.50pF               | CGA3E2C0G2A070D080AD    | CGA3E2C0G1H070D080AD   |
| 8pF         | 1005       | 0.50±0.10      | ±0.50pF               |                         | CGA2B2C0G1H080D050BD   |
|             | 1608       | 0.80±0.15      | ±0.50pF               | CGA3E2C0G2A080D080AD    | CGA3E2C0G1H080D080AD   |
| 9pF         | 1005       | 0.50±0.10      | ±0.50pF               |                         | CGA2B2C0G1H090D050BD   |
|             | 1608       | 0.80±0.15      | ±0.50pF               | CGA3E2C0G2A090D080AD    | CGA3E2C0G1H090D080AD   |
| 10pF        | 1005       | 0.50±0.10      | ±0.50pF               |                         | CGA2B2C0G1H100D050BD   |
|             | 1608       | 0.80±0.15      | ±0.50pF               | CGA3E2C0G2A100D080AD    | CGA3E2C0G1H100D080AD   |
| 12pF        | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H120J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A120J080AD    | CGA3E2C0G1H120J080AD   |
| 15pF        | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H150J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A150J080AD    | CGA3E2C0G1H150J080AD   |
| 18pF        | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H180J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A180J080AD    | CGA3E2C0G1H180J080AD   |
| 22pF        | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H220J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A220J080AD    | CGA3E2C0G1H220J080AD   |
| 27pF        | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H270J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A270J080AD    | CGA3E2C0G1H270J080AD   |
| 33pF        | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H330J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A330J080AD    | CGA3E2C0G1H330J080AD   |
| 39pF        | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H390J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A390J080AD    | CGA3E2C0G1H390J080AD   |
| 47pF        | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H470J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A470J080AD    | CGA3E2C0G1H470J080AD   |
| 56pF        | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H560J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A560J080AD    | CGA3E2C0G1H560J080AD   |
| 68pF        | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H680J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A680J080AD    | CGA3E2C0G1H680J080AD   |
| 82pF        | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H820J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A820J080AD    | CGA3E2C0G1H820J080AD   |
| 100pF       | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H101J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A101J080AD    | CGA3E2C0G1H101J080AD   |
| 120pF       | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H121J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A121J080AD    | CGA3E2C0G1H121J080AD   |
| 150pF       | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H151J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A151J080AD    | CGA3E2C0G1H151J080AD   |
| 180pF       | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H181J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A181J080AD    | CGA3E2C0G1H181J080AD   |
| 220pF       | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H221J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A221J080AD    | CGA3E2C0G1H221J080AD   |
| 270pF       | 1005       | 0.50±0.10      | ±5%                   |                         | CGA2B2C0G1H271J050BD   |
|             | 1608       | 0.80±0.15      | ±5%                   | CGA3E2C0G2A271J080AD    | CGA3E2C0G1H271J080AD   |

■ Gray item: The product which is not recommended to a new design.

## Capacitance range table

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

| Capacitance | Dimensions | Thickness (mm)  | Capacitance tolerance | Catalog number          |                        |
|-------------|------------|-----------------|-----------------------|-------------------------|------------------------|
|             |            |                 |                       | Rated voltage Edc: 100V | Rated voltage Edc: 50V |
| 330pF       | 1005       | 0.50±0.10       | ±5%                   |                         | CGA2B2C0G1H331J050BD   |
|             | 1608       | 0.80±0.15       | ±5%                   | CGA3E2C0G2A331J080AD    | CGA3E2C0G1H331J080AD   |
| 390pF       | 1005       | 0.50±0.10       | ±5%                   |                         | CGA2B2C0G1H391J050BD   |
|             | 1608       | 0.80±0.15       | ±5%                   | CGA3E2C0G2A391J080AD    | CGA3E2C0G1H391J080AD   |
| 470pF       | 1005       | 0.50±0.10       | ±5%                   |                         | CGA2B2C0G1H471J050BD   |
|             | 1608       | 0.80±0.15       | ±5%                   | CGA3E2C0G2A471J080AD    | CGA3E2C0G1H471J080AD   |
| 560pF       | 1005       | 0.50±0.10       | ±5%                   |                         | CGA2B2C0G1H561J050BD   |
|             | 1608       | 0.80±0.15       | ±5%                   | CGA3E2C0G2A561J080AD    | CGA3E2C0G1H561J080AD   |
| 680pF       | 1005       | 0.50±0.10       | ±5%                   |                         | CGA2B2C0G1H681J050BD   |
|             | 1608       | 0.80±0.15       | ±5%                   | CGA3E2C0G2A681J080AD    | CGA3E2C0G1H681J080AD   |
| 820pF       | 1005       | 0.50±0.10       | ±5%                   |                         | CGA2B2C0G1H821J050BD   |
|             | 1608       | 0.80±0.15       | ±5%                   | CGA3E2C0G2A821J080AD    | CGA3E2C0G1H821J080AD   |
| 1nF         | 1005       | 0.50±0.10       | ±5%                   |                         | CGA2B2C0G1H102J050BD   |
|             | 1608       | 0.80±0.15       | ±5%                   | CGA3E2C0G2A102J080AD    | CGA3E2C0G1H102J080AD   |
| 1.2nF       | 1608       | 0.80±0.15       | ±5%                   | CGA3E2C0G2A122J080AD    | CGA3E2C0G1H122J080AD   |
| 1.5nF       | 1608       | 0.80±0.15       | ±5%                   |                         | CGA3E2C0G1H152J080AD   |
| 1.8nF       | 1608       | 0.80±0.15       | ±5%                   |                         | CGA3E2C0G1H182J080AD   |
| 2.2nF       | 1608       | 0.80±0.15       | ±5%                   |                         | CGA3E2C0G1H222J080AD   |
|             | 1608       | 0.80±0.15       | ±5%                   |                         | CGA3E2C0G1H272J080AD   |
| 2.7nF       | 2012       | 0.60±0.15       | ±5%                   |                         | CGA4C2C0G1H272J060AD   |
|             | 1608       | 0.80±0.15       | ±5%                   |                         | CGA3E2C0G1H332J080AD   |
| 3.3nF       | 2012       | 0.60±0.15       | ±5%                   |                         | CGA4C2C0G1H332J060AD   |
|             | 1608       | 0.80±0.15       | ±5%                   |                         | CGA3E2C0G1H392J080AD   |
| 3.9nF       | 2012       | 0.60±0.15       | ±5%                   |                         | CGA4C2C0G1H392J060AD   |
|             | 1608       | 0.80±0.15       | ±5%                   |                         | CGA3E2C0G1H472J080AD   |
| 4.7nF       | 2012       | 0.60±0.15       | ±5%                   |                         | CGA4C2C0G1H472J060AD   |
|             | 3216       | 0.60±0.15       | ±5%                   |                         | CGA5C2C0G1H472J060AD   |
| 5.6nF       | 1608       | 0.80±0.15       | ±5%                   |                         | CGA3E2C0G1H562J080AD   |
|             | 2012       | 0.60±0.15       | ±5%                   |                         | CGA4C2C0G1H562J060AD   |
| 6.8nF       | 3216       | 0.60±0.15       | ±5%                   |                         | CGA5C2C0G1H562J060AD   |
|             | 1608       | 0.80±0.15       | ±5%                   |                         | CGA3E2C0G1H682J080AD   |
| 8.2nF       | 2012       | 0.60±0.15       | ±5%                   |                         | CGA4C2C0G1H682J060AD   |
|             | 3216       | 0.60±0.15       | ±5%                   |                         | CGA5C2C0G1H682J060AD   |
| 10nF        | 1608       | 0.80±0.15       | ±5%                   |                         | CGA3E2C0G1H822J080AD   |
|             | 2012       | 0.60±0.15       | ±5%                   |                         | CGA4C2C0G1H822J060AD   |
| 15nF        | 3216       | 0.60±0.15       | ±5%                   |                         | CGA5C2C0G1H822J060AD   |
|             | 2012       | 0.85±0.15       | ±5%                   |                         | CGA4F2C0G1H153J085AD   |
| 22nF        | 3216       | 0.60±0.15       | ±5%                   |                         | CGA5C2C0G1H153J060AD   |
|             | 2012       | 1.25±0.25       | ±5%                   |                         | CGA4J2C0G1H223J125AD   |
| 33nF        | 3216       | 0.60±0.15       | ±5%                   |                         | CGA5C2C0G1H223J060AD   |
|             | 2012       | 1.25±0.25       | ±5%                   |                         | CGA4J2C0G1H333J125AD   |
| 47nF        | 3216       | 0.85±0.15       | ±5%                   |                         | CGA5F2C0G1H333J085AD   |
|             | 3216       | 1.15±0.15       | ±5%                   |                         | CGA5H2C0G1H473J115AD   |
| 68nF        | 3216       | 1.60+0.30,-0.10 | ±5%                   |                         | CGA5L2C0G1H683J160AD   |
| 100nF       | 3216       | 1.60+0.30,-0.10 | ±5%                   |                         | CGA5L2C0G1H104J160AD   |

■ Gray item: The product which is not recommended to a new design.

## 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: 35V | Rated voltage Edc: 25V | Rated voltage Edc: 16V |
| 1nF         | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H102K080AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H102M080AD   |                        |                        |                        |
| 1.5nF       | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H1152K080AD  |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H1152M080AD  |                        |                        |                        |
| 2.2nF       | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H222K080AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H222M080AD   |                        |                        |                        |
| 3.3nF       | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H332K080AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H332M080AD   |                        |                        |                        |
| 4.7nF       | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H472K080AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H472M080AD   |                        |                        |                        |
| 6.8nF       | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H682K080AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H682M080AD   |                        |                        |                        |
| 10nF        | 1005            | 0.50±0.10       | ±10%                  | CGA2B3X7R1H103K050BD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA2B3X7R1H103M050BD   |                        |                        |                        |
|             | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H103K080AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H103M080AD   |                        |                        |                        |
| 15nF        | 1005            | 0.50±0.10       | ±10%                  | CGA2B3X7R1H153K050BD   |                        | CGA2B2X7R1E153K050BD   |                        |
|             |                 |                 | ±20%                  | CGA2B3X7R1H153M050BD   |                        | CGA2B2X7R1E153M050BD   |                        |
|             | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H153K080AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H153M080AD   |                        |                        |                        |
| 22nF        | 1005            | 0.50±0.10       | ±10%                  | CGA2B3X7R1H223K050BD   |                        | CGA2B2X7R1E223K050BD   |                        |
|             |                 |                 | ±20%                  | CGA2B3X7R1H223M050BD   |                        | CGA2B2X7R1E223M050BD   |                        |
|             | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H223K080AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H223M080AD   |                        |                        |                        |
| 33nF        | 1005            | 0.50±0.10       | ±10%                  | CGA2B3X7R1H333K050BD   |                        |                        | CGA2B2X7R1C333K050BD   |
|             |                 |                 | ±20%                  | CGA2B3X7R1H333M050BD   |                        |                        | CGA2B2X7R1C333M050BD   |
|             | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H333K080AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H333M080AD   |                        |                        |                        |
| 47nF        | 1005            | 0.50±0.10       | ±10%                  | CGA2B3X7R1H473K050BD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA2B3X7R1H473M050BD   |                        |                        |                        |
|             | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H473K080AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H473M080AD   |                        |                        |                        |
| 68nF        | 1005            | 0.50±0.10       | ±10%                  | CGA2B3X7R1H683K050BD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA2B3X7R1H683M050BD   |                        |                        |                        |
|             | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H683K080AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H683M080AD   |                        |                        |                        |
| 100nF       | 1005            | 0.50±0.10       | ±10%                  | CGA2B3X7R1H104K050BD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA2B3X7R1H104M050BD   |                        |                        |                        |
|             | 1608            | 0.80±0.15       | ±10%                  | CGA3E2X7R1H104K080AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA3E2X7R1H104M080AD   |                        |                        |                        |
| 150nF       | 1608            | 0.80±0.15       | ±10%                  | CGA3E3X7R1H154K080AD   |                        | CGA3E2X7R1E154K080AD   |                        |
|             |                 |                 | ±20%                  | CGA3E3X7R1H154M080AD   |                        | CGA3E2X7R1E154M080AD   |                        |
|             | 2012            | 1.25±0.25       | ±10%                  | CGA4J2X7R1H154K125AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA4J2X7R1H154M125AD   |                        |                        |                        |
| 220nF       | 1608            | 0.80±0.15       | ±10%                  | CGA3E3X7R1H224K080AD   |                        |                        | CGA3E2X7R1C224K080AD   |
|             |                 |                 | ±20%                  | CGA3E3X7R1H224M080AD   |                        |                        | CGA3E2X7R1C224M080AD   |
|             | 2012            | 1.25±0.25       | ±10%                  | CGA4J2X7R1H224K125AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA4J2X7R1H224M125AD   |                        |                        |                        |
| 330nF       | 1608            | 0.80±0.15       | ±10%                  |                        | CGA3E1X7R1V334K080AD   | CGA3E3X7R1E334K080AD   |                        |
|             |                 |                 | ±20%                  |                        | CGA3E1X7R1V334M080AD   | CGA3E3X7R1E334M080AD   |                        |
|             | 2012            | 1.25±0.25       | ±10%                  | CGA4J2X7R1H334K125AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA4J2X7R1H334M125AD   |                        |                        |                        |
| 470nF       | 1608            | 0.80±0.15       | ±10%                  |                        | CGA3E1X7R1V474K080AD   | CGA3E3X7R1E474K080AD   |                        |
|             |                 |                 | ±20%                  |                        | CGA3E1X7R1V474M080AD   | CGA3E3X7R1E474M080AD   |                        |
|             | 2012            | 1.25±0.25       | ±10%                  |                        |                        | CGA4J2X7R1E474K125AD   |                        |
|             |                 |                 | ±20%                  |                        |                        | CGA4J2X7R1E474M125AD   |                        |
| 680nF       | 3216            | 1.60+0.30,-0.10 | ±10%                  | CGA5L2X7R1H474K160AD   |                        |                        |                        |
|             |                 |                 | ±20%                  | CGA5L2X7R1H474M160AD   |                        |                        |                        |
|             | 1608            | 0.80±0.15       | ±10%                  |                        |                        | CGA3E1X7R1E684K080AD   |                        |
|             |                 |                 | ±20%                  |                        |                        | CGA3E1X7R1E684M080AD   |                        |
| 3216        | 1.60+0.30,-0.10 | ±10%            |                       |                        | CGA4J3X7R1E684K125AD   | CGA4J2X7R1C684K125AD   |                        |
|             |                 |                 |                       |                        | CGA4J3X7R1E684M125AD   | CGA4J2X7R1C684M125AD   |                        |
|             | ±20%            |                 |                       | CGA5L2X7R1H684K160AD   |                        |                        |                        |
|             |                 |                 |                       | CGA5L2X7R1H684M160AD   |                        |                        |                        |


■ Gray item: The product which is not recommended to a new design.

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## 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: 6.3V |
| 1µF         | 1608            | 0.80±0.15       | ±10%                  |                        | CGA3E1X7R1E105K080AD   |                        |                         |
|             |                 |                 | ±20%                  |                        | CGA3E1X7R1E105M080AD   |                        |                         |
|             | 2012            | 1.25±0.25       | ±10%                  |                        | CGA4J3X7R1E105K125AD   | CGA4J2X7R1C105K125AD   |                         |
|             |                 |                 | ±20%                  |                        | CGA4J3X7R1E105M125AD   | CGA4J2X7R1C105M125AD   |                         |
| 3216        | 1.60+0.30,-0.10 | ±10%            |                       | CGA5L2X7R1E105K160AD   |                        |                        |                         |
|             |                 | ±20%            |                       | CGA5L2X7R1E105M160AD   |                        |                        |                         |
| 3225        | 1.60±0.20       |                 | ±10%                  | CGA6L2X7R1H105K160AD   |                        |                        |                         |
|             |                 |                 | ±20%                  | CGA6L2X7R1H105M160AD   |                        |                        |                         |
| 1.5µF       | 2012            | 1.25±0.25       | ±10%                  |                        | CGA4J1X7R1E155K125AD   |                        |                         |
|             |                 |                 | ±20%                  |                        | CGA4J1X7R1E155M125AD   |                        |                         |
| 3225        | 2.00±0.20       |                 | ±10%                  | CGA6M2X7R1H155K200AD   |                        |                        |                         |
|             |                 |                 | ±20%                  | CGA6M2X7R1H155M200AD   |                        |                        |                         |
| 2.2µF       | 2012            | 1.25±0.25       | ±10%                  |                        | CGA4J3X7R1E225K125AD   |                        |                         |
|             |                 |                 | ±20%                  |                        | CGA4J3X7R1E225M125AD   |                        |                         |
| 3216        | 1.60+0.30,-0.10 |                 | ±10%                  |                        | CGA5L2X7R1E225K160AD   |                        |                         |
|             |                 |                 | ±20%                  |                        | CGA5L2X7R1E225M160AD   |                        |                         |
| 3.3µF       | 2012            | 1.25±0.25       | ±10%                  |                        | CGA4J1X7R1E335K125AD   | CGA4J3X7R1C335K125AD   |                         |
|             |                 |                 | ±20%                  |                        | CGA4J1X7R1E335M125AD   | CGA4J3X7R1C335M125AD   |                         |
| 4.7µF       | 2012            | 1.25+0.30,-0.25 | ±10%                  |                        | CGA4J1X7R1E475K125AD   | CGA4J3X7R1C475K125AD   |                         |
|             |                 |                 | ±20%                  |                        | CGA4J1X7R1E475M125AD   | CGA4J3X7R1C475M125AD   |                         |
|             | 3216            | 1.60+0.30,-0.10 | ±10%                  |                        |                        | CGA5L3X7R1C475K160AD   |                         |
|             |                 |                 | ±20%                  |                        |                        | CGA5L3X7R1C475M160AD   |                         |
| 3225        | 2.00±0.20       |                 | ±10%                  |                        | CGA6M2X7R1E475K200AD   |                        |                         |
|             |                 |                 | ±20%                  |                        | CGA6M2X7R1E475M200AD   |                        |                         |
| 2.50±0.30   |                 |                 | ±10%                  | CGA6P3X7R1H475K250AD   |                        |                        |                         |
|             |                 |                 | ±20%                  | CGA6P3X7R1H475M250AD   |                        |                        |                         |
| 6.8µF       | 2012            | 1.25±0.25       | ±10%                  |                        |                        | CGA4J1X7R0J685K125AD   |                         |
|             |                 |                 | ±20%                  |                        |                        | CGA4J1X7R0J685M125AD   |                         |
| 3216        | 1.60+0.30,-0.10 |                 | ±10%                  |                        | CGA5L1X7R1E685K160AD   |                        |                         |
|             |                 |                 | ±20%                  |                        | CGA5L1X7R1E685M160AD   |                        |                         |
| 10µF        | 2012            | 1.25±0.25       | ±10%                  |                        |                        | CGA4J1X7R0J106K125AD   |                         |
|             |                 |                 | ±20%                  |                        |                        | CGA4J1X7R0J106M125AD   |                         |
| 3216        | 1.60+0.30,-0.10 |                 | ±10%                  |                        | CGA5L1X7R1E106K160AD   |                        |                         |
|             |                 |                 | ±20%                  |                        | CGA5L1X7R1E106M160AD   |                        |                         |

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## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

## Temperature characteristics: X8R (-55 to +150°C, ±15%)

| Capacitance | Dimensions | Thickness (mm) | Capacitance tolerance | Catalog number          |                        |                        |                        |
|-------------|------------|----------------|-----------------------|-------------------------|------------------------|------------------------|------------------------|
|             |            |                |                       | Rated voltage Edc: 100V | Rated voltage Edc: 50V | Rated voltage Edc: 25V | Rated voltage Edc: 16V |
| 150pF       | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B2X8R1H151K050BD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA2B2X8R1H151M050BD   |                        |                        |
| 220pF       | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B2X8R1H221K050BD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA2B2X8R1H221M050BD   |                        |                        |
| 330pF       | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B2X8R1H331K050BD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA2B2X8R1H331M050BD   |                        |                        |
| 470pF       | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B2X8R1H471K050BD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA2B2X8R1H471M050BD   |                        |                        |
| 680pF       | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B2X8R1H681K050BD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA2B2X8R1H681M050BD   |                        |                        |
| 1nF         | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B2X8R1H102K050BD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA2B2X8R1H102M050BD   |                        |                        |
| 1.5nF       | 1608       | 0.80±0.15      | ±10%                  | CGA3E2X8R2A102K080AD    | CGA3E2X8R1H102K080AD   |                        |                        |
|             |            |                | ±20%                  | CGA3E2X8R2A102M080AD    | CGA3E2X8R1H102M080AD   |                        |                        |
| 2.2nF       | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B2X8R1H152K050BD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA2B2X8R1H152M050BD   |                        |                        |
| 2.2nF       | 1608       | 0.80±0.15      | ±10%                  | CGA3E2X8R2A152K080AD    | CGA3E2X8R1H152K080AD   |                        |                        |
|             |            |                | ±20%                  | CGA3E2X8R2A152M080AD    | CGA3E2X8R1H152M080AD   |                        |                        |
| 3.3nF       | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B2X8R1H222K050BD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA2B2X8R1H222M050BD   |                        |                        |
| 3.3nF       | 1608       | 0.80±0.15      | ±10%                  | CGA3E2X8R2A222K080AD    | CGA3E2X8R1H222K080AD   |                        |                        |
|             |            |                | ±20%                  | CGA3E2X8R2A222M080AD    | CGA3E2X8R1H222M080AD   |                        |                        |
| 4.7nF       | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B2X8R1H332K050BD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA2B2X8R1H332M050BD   |                        |                        |
| 4.7nF       | 1608       | 0.80±0.15      | ±10%                  | CGA3E2X8R2A332K080AD    | CGA3E2X8R1H332K080AD   |                        |                        |
|             |            |                | ±20%                  | CGA3E2X8R2A332M080AD    | CGA3E2X8R1H332M080AD   |                        |                        |
| 6.8nF       | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B3X8R1H472K050BD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA2B3X8R1H472M050BD   |                        |                        |
| 6.8nF       | 1608       | 0.80±0.15      | ±10%                  | CGA3E2X8R2A472K080AD    | CGA3E2X8R1H472K080AD   |                        |                        |
|             |            |                | ±20%                  | CGA3E2X8R2A472M080AD    | CGA3E2X8R1H472M080AD   |                        |                        |
| 10nF        | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B3X8R1H682K050BD   | CGA2B2X8R1E682K050BD   |                        |
|             |            |                | ±20%                  |                         | CGA2B3X8R1H682M050BD   | CGA2B2X8R1E682M050BD   |                        |
| 10nF        | 1608       | 0.80±0.15      | ±10%                  | CGA3E2X8R2A682K080AD    | CGA3E2X8R1H682K080AD   |                        |                        |
|             |            |                | ±20%                  | CGA3E2X8R2A682M080AD    | CGA3E2X8R1H682M080AD   |                        |                        |
| 10nF        | 2012       | 0.85±0.15      | ±10%                  | CGA4F2X8R2A103K085AD    | CGA3E2X8R1H103K080AD   |                        |                        |
|             |            |                | ±20%                  | CGA4F2X8R2A103M085AD    | CGA3E2X8R1H103M080AD   |                        |                        |
| 15nF        | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B3X8R1E153K050BD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA2B3X8R1E153M050BD   |                        |                        |
| 15nF        | 1608       | 0.80±0.15      | ±10%                  | CGA3E2X8R2A153K080AD    | CGA3E2X8R1H153K080AD   |                        |                        |
|             |            |                | ±20%                  | CGA3E2X8R2A153M080AD    | CGA3E2X8R1H153M080AD   |                        |                        |
| 15nF        | 2012       | 0.85±0.15      | ±10%                  | CGA4F2X8R2A153K085AD    |                        |                        |                        |
|             |            |                | ±20%                  | CGA4F2X8R2A153M085AD    |                        |                        |                        |
| 22nF        | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B3X8R1E223K050BD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA2B3X8R1E223M050BD   |                        |                        |
| 22nF        | 1608       | 0.80±0.15      | ±10%                  | CGA3E3X8R2A223K080AD    | CGA3E2X8R1H223K080AD   |                        |                        |
|             |            |                | ±20%                  | CGA3E3X8R2A223M080AD    | CGA3E2X8R1H223M080AD   |                        |                        |
| 22nF        | 2012       | 1.25±0.25      | ±10%                  | CGA4J2X8R2A223K125AD    |                        |                        |                        |
|             |            |                | ±20%                  | CGA4J2X8R2A223M125AD    |                        |                        |                        |
| 33nF        | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B1X8R1E333K050BD   | CGA2B3X8R1C333K050BD   |                        |
|             |            |                | ±20%                  |                         | CGA2B1X8R1E333M050BD   | CGA2B3X8R1C333M050BD   |                        |
| 33nF        | 1608       | 0.80±0.15      | ±10%                  | CGA3E3X8R2A333K080AD    | CGA3E2X8R1H333K080AD   |                        |                        |
|             |            |                | ±20%                  | CGA3E3X8R2A333M080AD    | CGA3E2X8R1H333M080AD   |                        |                        |
| 33nF        | 2012       | 1.25±0.25      | ±10%                  | CGA4J3X8R2A333K125AD    |                        |                        |                        |
|             |            |                | ±20%                  | CGA4J3X8R2A333M125AD    |                        |                        |                        |
| 33nF        | 3216       | 0.85±0.15      | ±10%                  | CGA5F2X8R2A333K085AD    |                        |                        |                        |
|             |            |                | ±20%                  | CGA5F2X8R2A333M085AD    |                        |                        |                        |
| 47nF        | 1005       | 0.50±0.10      | ±10%                  |                         | CGA2B1X8R1E473K050BD   | CGA2B3X8R1C473K050BD   |                        |
|             |            |                | ±20%                  |                         | CGA2B1X8R1E473M050BD   | CGA2B3X8R1C473M050BD   |                        |
| 47nF        | 1608       | 0.80±0.15      | ±10%                  |                         | CGA3E2X8R1H473K080AD   |                        |                        |
|             |            |                | ±20%                  |                         | CGA3E2X8R1H473M080AD   |                        |                        |
| 47nF        | 2012       | 1.25±0.25      | ±10%                  | CGA4J3X8R2A473K125AD    |                        |                        |                        |
|             |            |                | ±20%                  | CGA4J3X8R2A473M125AD    |                        |                        |                        |
| 47nF        | 3216       | 0.85±0.15      | ±10%                  | CGA5F2X8R2A473K085AD    |                        |                        |                        |
|             |            |                | ±20%                  | CGA5F2X8R2A473M085AD    |                        |                        |                        |

■ Gray item: The product which is not recommended to a new design.

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Please note that the contents may change without any prior notice due to reasons such as upgrading.

MULTILAYER CERAMIC CHIP CAPACITORS



Capacitance range table

Temperature characteristics: X8R (-55 to +150°C, ±15%)

| Capacitance | Dimensions | Thickness (mm)  | Capacitance tolerance | Catalog number          |                        |                        |                        |
|-------------|------------|-----------------|-----------------------|-------------------------|------------------------|------------------------|------------------------|
|             |            |                 |                       | Rated voltage Edc: 100V | Rated voltage Edc: 50V | Rated voltage Edc: 25V | Rated voltage Edc: 16V |
| 68nF        | 1608       | 0.80±0.15       | ±10%                  |                         | CGA3E3X8R1H683K080AD   | CGA3E2X8R1E683K080AD   |                        |
|             |            |                 | ±20%                  |                         | CGA3E3X8R1H683M080AD   | CGA3E2X8R1E683M080AD   |                        |
|             | 2012       | 1.25±0.25       | ±10%                  | CGA4J3X8R2A683K125AD    | CGA4J2X8R1H683K125AD   |                        |                        |
|             |            |                 | ±20%                  | CGA4J3X8R2A683M125AD    | CGA4J2X8R1H683M125AD   |                        |                        |
|             | 3216       | 1.15±0.15       | ±10%                  | CGA5H2X8R2A683K115AD    |                        |                        |                        |
|             |            |                 | ±20%                  | CGA5H2X8R2A683M115AD    |                        |                        |                        |
| 100nF       | 1608       | 0.80±0.15       | ±10%                  |                         | CGA3E3X8R1H104K080AD   | CGA3E2X8R1E104K080AD   |                        |
|             |            |                 | ±20%                  |                         | CGA3E3X8R1H104M080AD   | CGA3E2X8R1E104M080AD   |                        |
|             | 2012       | 1.25±0.25       | ±10%                  |                         | CGA4J2X8R1H104K125AD   |                        |                        |
|             |            |                 | ±20%                  |                         | CGA4J2X8R1H104M125AD   |                        |                        |
|             | 3216       | 1.15±0.15       | ±10%                  | CGA5H2X8R2A104K115AD    |                        |                        |                        |
|             |            |                 | ±20%                  | CGA5H2X8R2A104M115AD    |                        |                        |                        |
| 150nF       | 1608       | 0.80±0.15       | ±10%                  |                         |                        | CGA3E3X8R1E154K080AD   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA3E3X8R1E154M080AD   |                        |
|             | 2012       | 0.85±0.15       | ±10%                  |                         |                        | CGA4F2X8R1E154K085AD   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA4F2X8R1E154M085AD   |                        |
|             | 3216       | 1.60+0.30,-0.10 | ±10%                  | CGA5L2X8R2A154K160AD    | CGA4J3X8R1H154K125AD   |                        |                        |
|             |            |                 | ±20%                  | CGA5L2X8R2A154M160AD    | CGA4J3X8R1H154M125AD   |                        |                        |
| 220nF       | 1608       | 0.80±0.15       | ±10%                  |                         |                        | CGA3E3X8R1E224K080AD   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA3E3X8R1E224M080AD   |                        |
|             | 2012       | 1.25±0.25       | ±10%                  |                         | CGA4J3X8R1H224K125AD   | CGA4J2X8R1E224K125AD   |                        |
|             |            |                 | ±20%                  |                         | CGA4J3X8R1H224M125AD   | CGA4J2X8R1E224M125AD   |                        |
|             | 3216       | 1.15±0.15       | ±10%                  |                         | CGA5H2X8R1H224K115AD   |                        |                        |
|             |            |                 | ±20%                  |                         | CGA5H2X8R1H224M115AD   |                        |                        |
| 330nF       | 1608       | 0.80±0.15       | ±10%                  |                         |                        | CGA3E1X8R1E334K080AD   | CGA3E3X8R1C334K080AD   |
|             |            |                 | ±20%                  |                         |                        | CGA3E1X8R1E334M080AD   | CGA3E3X8R1C334M080AD   |
|             | 2012       | 1.25±0.25       | ±10%                  |                         | CGA4J2X8R1E334K125AD   |                        |                        |
|             |            |                 | ±20%                  |                         | CGA4J2X8R1E334M125AD   |                        |                        |
|             | 3216       | 1.60+0.30,-0.10 | ±10%                  | CGA5L3X8R2A334K160AD    | CGA5L2X8R1H334K160AD   |                        |                        |
|             |            |                 | ±20%                  | CGA5L3X8R2A334M160AD    | CGA5L2X8R1H334M160AD   |                        |                        |
| 470nF       | 1608       | 0.80±0.15       | ±10%                  |                         |                        |                        | CGA3E3X8R1C474K080AD   |
|             |            |                 | ±20%                  |                         |                        |                        | CGA3E3X8R1C474M080AD   |
|             | 2012       | 1.25±0.25       | ±10%                  |                         |                        | CGA4J3X8R1E474K125AD   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA4J3X8R1E474M125AD   |                        |
|             | 3216       | 1.60+0.30,-0.10 | ±10%                  |                         |                        | CGA5F2X8R1E474K085AD   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA5F2X8R1E474M085AD   |                        |
| 680nF       | 1608       | 0.80±0.15       | ±10%                  |                         |                        |                        |                        |
|             |            |                 | ±20%                  |                         |                        |                        |                        |
|             | 2012       | 1.25±0.25       | ±10%                  |                         |                        | CGA4J1X8R1E684K125AD   | CGA4J3X8R1C684K125AD   |
|             |            |                 | ±20%                  |                         |                        | CGA4J1X8R1E684M125AD   | CGA4J3X8R1C684M125AD   |
|             | 3216       | 1.15±0.15       | ±10%                  |                         |                        | CGA5H2X8R1E684K115AD   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA5H2X8R1E684M115AD   |                        |
| 1µF         | 1608       | 0.80±0.15       | ±10%                  |                         |                        |                        |                        |
|             |            |                 | ±20%                  |                         |                        |                        |                        |
|             | 2012       | 1.25±0.25       | ±10%                  |                         |                        | CGA4J1X8R1E105K125AD   | CGA4J3X8R1C105K125AD   |
|             |            |                 | ±20%                  |                         |                        | CGA4J1X8R1E105M125AD   | CGA4J3X8R1C105M125AD   |
|             | 3216       | 1.60+0.30,-0.10 | ±10%                  |                         | CGA5L3X8R1H105K160AD   | CGA5L2X8R1E105K160AD   |                        |
|             |            |                 | ±20%                  |                         | CGA5L3X8R1H105M160AD   | CGA5L2X8R1E105M160AD   |                        |
| 1.5µF       | 1608       | 0.80±0.15       | ±10%                  |                         |                        | CGA5L3X8R1E155K160AD   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA5L3X8R1E155M160AD   |                        |
|             | 2012       | 1.25±0.25       | ±10%                  |                         |                        | CGA6L2X8R1E155K160AD   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA6L2X8R1E155M160AD   |                        |
|             | 3216       | 1.60+0.30,-0.10 | ±10%                  |                         |                        | CGA5L3X8R1E225K160AD   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA5L3X8R1E225M160AD   |                        |
| 2.2µF       | 1608       | 0.80±0.15       | ±10%                  |                         |                        |                        |                        |
|             |            |                 | ±20%                  |                         |                        |                        |                        |
|             | 2012       | 1.25±0.25       | ±10%                  |                         |                        | CGA6M2X8R1E225K200AD   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA6M2X8R1E225M200AD   |                        |
|             | 3216       | 1.60+0.30,-0.10 | ±10%                  |                         |                        |                        |                        |
|             |            |                 | ±20%                  |                         |                        |                        |                        |

■ Gray item: The product which is not recommended to a new design.

⚠ 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.

## Capacitance range table

Temperature characteristics: X8R (–55 to +150°C, ±15%)

| Capacitance | Dimensions | Thickness<br>(mm) | Capacitance<br>tolerance | Catalog number         |                        |
|-------------|------------|-------------------|--------------------------|------------------------|------------------------|
|             |            |                   |                          | Rated voltage Edc: 25V | Rated voltage Edc: 16V |
| 3.3μF       | 3216       | 1.60+0.30,-0.10   | ±10%                     | CGA5L1X8R1E335K160AD   | CGA5L3X8R1C335K160AD   |
|             |            |                   | ±20%                     | CGA5L1X8R1E335M160AD   | CGA5L3X8R1C335M160AD   |
|             | 3225       | 2.50±0.30         | ±10%                     | CGA6P2X8R1E335K250AD   |                        |
|             |            |                   | ±20%                     | CGA6P2X8R1E335M250AD   |                        |
| 4.7μF       | 3216       | 1.60+0.30,-0.10   | ±10%                     | CGA5L1X8R1E475K160AD   | CGA5L3X8R1C475K160AD   |
|             |            |                   | ±20%                     | CGA5L1X8R1E475M160AD   | CGA5L3X8R1C475M160AD   |
|             | 3225       | 2.50±0.30         | ±10%                     | CGA6P3X8R1E475K250AD   |                        |
|             |            |                   | ±20%                     | CGA6P3X8R1E475M250AD   |                        |
| 6.8μF       | 3225       | 2.00±0.20         | ±10%                     | CGA6M1X8R1E685K200AD   | CGA6M3X8R1C685K200AD   |
|             |            |                   | ±20%                     | CGA6M1X8R1E685M200AD   | CGA6M3X8R1C685M200AD   |
| 10μF        | 3225       | 2.50±0.30         | ±10%                     | CGA6P1X8R1E106K250AD   | CGA6P3X8R1C106K250AD   |
|             |            |                   | ±20%                     | CGA6P1X8R1E106M250AD   | CGA6P3X8R1C106M250AD   |



# Mouser Electronics

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[CGA3E2X7R1H222K080AD](#) [CGA3E2X8R1H104K080AD](#) [CGA3E2X8R2A103K080AD](#) [CGA6L2X7R1H105K160AD](#)  
[CGA2B2C0G1H100D050BD](#) [CGA3E2X7R1H472K080AD](#) [CGA2B2X8R1H222K050BD](#) [CGA3E2C0G1H100D080AD](#)  
[CGA3E2C0G2A101J080AD](#) [CGA3E2C0G2A221J080AD](#) [CGA3E2X8R1H103K080AD](#) [CGA3E2X8R2A222K080AD](#)  
[CGA2B2X8R1H471K050BD](#) [CGA3E2X7R1H102K080AD](#) [CGA3E2X7R1H223K080AD](#) [CGA3E2C0G2A471J080AD](#)  
[CGA5L2X8R1E105K160AD](#) [CGA2B2X8R1H102K050BD](#) [CGA2B2X8R1H221K050BD](#) [CGA3E2C0G1H101D080AD](#)  
[CGA4J2X7R1E105K125AD](#) [CGA3E2C0G1H102D080AD](#) [CGA5L2X7R1E106K160AD](#) [CGA4J2X8R1H104K125AD](#)  
[CGA2B2C0G1H101J050BD](#) [CGA2B2X8R1H472K050BD](#) [CGA3E2X8R1H223K080AD](#) [CGA3E2X8R2A102K080AD](#)  
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[CGA4J3X8R2A333M125AD](#) [CGA3E3X8R2A223M080AD](#) [CGA4J3X8R2A683K125AD](#) [CGA6M3X8R2A474K200AD](#)  
[CGA6M3X8R2A474M200AD](#) [CGA6P3X8R2A684M250AD](#) [CGA4J3X8R2A473K125AD](#) [CGA6P3X8R1E475K250AD](#)  
[CGA5L3X8R2A224K160AD](#) [CGA5L3X8R1H105K160AD](#) [CGA4J3X8R2A473M125AD](#) [CGA5L3X8R2A334K160AD](#)  
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