

# MULTILAYER CERAMIC CHIP CAPACITORS

Commercial Grade, MEGACAP Type

## CKG series

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### Single type

CKG32K 3225 [1210 inch]

CKG45K 4532 [1812 inch]

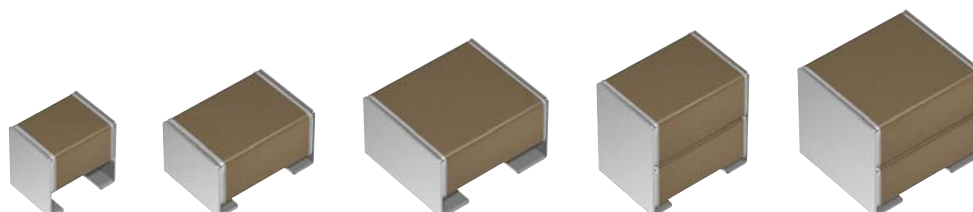
CKG57K 5750 [2220 inch]

### Stacked type

CKG45N 4532 [1812 inch]

CKG57N 5750 [2220 inch]

\* Dimensions code: JIS[EIA]



# REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

## SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using this products.

### REMINDERS

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

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

If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in the each catalog, please contact us.

- |   |  |
|---|--|
| (1) Aerospace/aviation equipment                                  | (8) Public information-processing equipment                                  |
| (2) Transportation equipment (cars, electric trains, ships, etc.) | (9) Military equipment   |
| (3) Medical equipment   | (10) Electric heating apparatus, burning equipment                           |
| (4) Power-generation control equipment                            | (11) Disaster prevention/crime prevention equipment                          |
| (5) Atomic energy-related equipment                               | (12) Safety equipment  |
| (6) Seabed equipment  | (13) Other applications that are not considered general-purpose applications |
| (7) Transportation control equipment                              |  |

When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.

- We may modify products or discontinue production of a product listed in this catalog without prior notification.
- We provide "Delivery Specification" that explain precautions for the specifications and safety of each product listed in this catalog. We strongly recommend that you exchange these delivery specifications with customers that use one of these products.
- If you plan to export a product listed in this catalog, keep in mind that it may be a restricted item according to the "Foreign Exchange and Foreign Trade Control Law". In such cases, it is necessary to acquire export permission in harmony with this law.
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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                  |

# CKG series

## MEGACAP type



Type: CKG32K/ 3225 [1210 inch], CKG45K/ 4532 [1812 inch], CKG57K/ 5750 [2220 inch],  
CKG45N/ 4532 [1812 inch], CKG57N/ 5750 [2220 inch]

### SERIES OVERVIEW

TDK multilayer ceramic chip capacitor CKG series is a product which metal-frames are connected to terminations of MLCC, and it is also called MEGACAP.

MEGACAP has higher mechanical endurance by the flexible metal-frame structure which absorbs thermal and mechanical stress.

Also the stacked type is effective in mounting area reduction because twice capacitance is realized by double-stacked structure without changing footprint.

### FEATURES

- Higher mechanical endurance is realized by metal-frame structure.
- Twice capacitance is realized by double-stacked structure without changing footprint.
- Lower ESR and ESL than Al caps.
- COG temperature characteristic which has excellent stable temperature and DC-bias characteristics is applicable.
- Mounting on Al board is applicable.

### APPLICATIONS

- Smoothing circuits.
- DC-DC converters, inverters, battery chargers.
- The places where Al electrolytic or Film capacitor is not suitable because of higher ESR/ESL, heat resistivity, or its size.
- The COG temperature characteristic is suitable for the high-reliability circuits such as time constant, filter, resonance, oscillation and snubber circuits.

### SHAPE & DIMENSIONS



| Type   | Dimensions in mm |           |           |           |
|--------|------------------|-----------|-----------|-----------|
|        | L                | W         | T         | E         |
| CKG32K | 3.60±0.30        | 2.60±0.30 | 3.35±0.10 | 0.80±0.15 |
| CKG45K | 5.00±0.50        | 3.50±0.50 | 2.90±0.10 | 1.10±0.30 |
| CKG57K | 6.00±0.50        | 5.00±0.50 | 3.35±0.15 | 1.60±0.30 |
| CKG45N | 5.00±0.50        | 3.50±0.50 | 5.00±0.50 | 1.10±0.30 |
| CKG57N | 6.00±0.50        | 5.00±0.50 | 5.00±0.50 | 1.60±0.30 |

\*Dimensional tolerances are typical values.

**CATALOG NUMBER CONSTRUCTION**

|            |           |          |            |           |            |          |            |          |          |
|------------|-----------|----------|------------|-----------|------------|----------|------------|----------|----------|
| <b>CKG</b> | <b>57</b> | <b>N</b> | <b>X7R</b> | <b>1E</b> | <b>107</b> | <b>M</b> | <b>500</b> | <b>J</b> | <b>H</b> |
| (1)        | (2)       | (3)      | (4)        | (5)       | (6)        | (7)      | (8)        | (9)      | (10)     |

## (1) Series

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

| Code | EIA    | Length | Width | Metal terminal width |
|------|--------|--------|-------|----------------------|
| 32   | CC1210 | 3.60   | 2.60  | 0.80                 |
| 45   | CC1812 | 5.00   | 3.50  | 1.10                 |
| 57   | CC2220 | 6.00   | 5.00  | 1.60                 |

## (3) Structure

| Code | Description  |
|------|--------------|
| K    | Single type  |
| N    | Stacked type |

## (4) Temperature characteristics

| Temperature characteristics | Temperature coefficient or capacitance change | Temperature ranges |
|-----------------------------|---|--------------------|
| C0G                         | 0±30ppm/°C                                    | -55 to +125°C      |
| X5R                         | ±15%  | -55 to +85°C       |
| X7R                         | ±15%  | -55 to +125°C      |
| X7S                         | ±22%  | -55 to +125°C      |
| X7T                         | +22, -33%                                     | -55 to +125°C      |

## (5) Rated voltage (DC)

| Code | Voltage (DC) |
|------|--------------|
| 1C   | 16V          |
| 1E   | 25V          |
| 1H   | 50V          |
| 2A   | 100V         |
| 2E   | 250V         |
| 2W   | 450V         |
| 2J   | 630V         |
| 3A   | 1000V        |

## (6) 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

## (7) Capacitance tolerance

| Code | Tolerance |
|------|-----------|
| J    | ± 5%      |
| K    | ± 10%     |
| M    | ± 20%     |

## (8) Thickness

| Code | Thickness |
|------|-----------|
| 290  | 2.90 mm   |
| 335  | 3.35 mm   |
| 500  | 5.00 mm   |

## (9) Packaging style

| Code | Style                 |
|------|-----------------------|
| A    | 178mm reel, 4mm pitch |
| J    | 330mm reel, 8mm pitch |

## (10) Special reserved code

| Code | Description  |
|------|--------------|
| H    | MEGACAP type |

MULTILAYER CERAMIC CHIP CAPACITORS TDK

Capacitance range chart

CKG32K/ 3225 [1210 inch], Single type

| Capacitance |      | Tolerance   | C0G      |           |           |           |           | X7R       |           |           |          |          | X7S       |          | X7T       |           |           |
|-------------|------|---|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|-----------|----------|-----------|-----------|-----------|
| (pF)        | Code |   | 3A (1kV) | 2J (630V) | 2W (450V) | 2E (250V) | 2A (100V) | 2J (630V) | 2E (250V) | 2A (100V) | 1H (50V) | 1E (25V) | 2A (100V) | 1H (50V) | 2J (630V) | 2W (450V) | 2E (250V) |
| 1,000       | 102  | J: ±5%  | █        |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 1,200       | 122  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 1,500       | 152  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 1,800       | 182  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 2,200       | 222  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 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  | C0G ;<br>J: ±5%<br>X7R, X7S,<br>X7T ;<br>K: ±10%<br>M: ±20% |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 68,000      | 683  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 100,000     | 104  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 150,000     | 154  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 220,000     | 224  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 330,000     | 334  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 470,000     | 474  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 1,000,000   | 105  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 2,200,000   | 225  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 3,300,000   | 335  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 4,700,000   | 475  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 6,800,000   | 685  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |
| 10,000,000  | 106  |   |          |           |           |           |           |           |           |           |          |          |           |          |           |           |           |

Standard thickness 3.35 mm

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

█ Please refer to the capacitance range table after P-9 for the details such as product thickness and capacitance tolerance.

Capacitance range chart

CKG45K/ 4532 [1812 inch], Single type

| Capacitance |      | Tolerance          | C0G       |           |           | X7R       |           |           |          |          | X7S      |           |          | X7T      |           |           |           |
|-------------|------|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|-----------|----------|----------|-----------|-----------|-----------|
| (pF)        | Code |                    | 2J (630V) | 2W (450V) | 2E (250V) | 2J (630V) | 2E (250V) | 2A (100V) | 1H (50V) | 1E (25V) | 1C (16V) | 2A (100V) | 1H (50V) | 1C (16V) | 2J (630V) | 2W (450V) | 2E (250V) |
| 33,000      | 333  | J: ±5%             | █         |           |           |           |           |           |          |          |          |           |          |          |           |           |           |
| 47,000      | 473  |                    |           |           |           |           |           |           |          |          |          |           |          |          |           |           |           |
| 68,000      | 683  |                    |           |           |           |           |           |           |          |          |          |           |          |          |           |           |           |
| 100,000     | 104  | K: ±10%<br>M: ±20% |           |           |           |           |           |           |          |          |          |           |          |          |           |           |           |
| 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  |                    |           |           |           |           |           |           |          |          |          |           |          |          |           |           |           |
| 10,000,000  | 106  |                    |           |           |           |           |           |           |          |          |          |           |          |          |           |           |           |
| 22,000,000  | 226  |                    | M: ±20%   |           |           |           |           |           |          |          |          |           |          |          |           |           |           |

Standard thickness 2.90 mm


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

█ Please refer to the capacitance range table after P-9 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

## CKG57K/ 5750 [2220 inch], Single type

| Capacitance |      | Tolerance          | C0G   |   | X7R          |   |   |   |             | X7S   |   |             | X7T   |   |   |   |   |
|-------------|------|--------------------|---|---|--------------|---|---|---|-------------|---|---|-------------|---|---|---|---|---|
| (pF)        | Code |                    | 2J<br>(630V)  | 2E<br>(250V)  | 2J<br>(630V) | 2E<br>(250V)  | 2A<br>(100V)  | 1H<br>(50V)   | 1E<br>(25V) | 1C<br>(16V)   | 2A<br>(100V)  | 1H<br>(50V) | 1C<br>(16V)   | 2J<br>(630V)  | 2W<br>(450V)  | 2E<br>(250V)  |   |
| 68,000      | 683  | J: ±5%             |  |   |              |   |   |   |             |   |   |             |   |   |   |   |   |
| 150,000     | 154  |                    |  |   |              |   |   |   |             |   |   |             |   |   |   |   |   |
| 220,000     | 224  | K: ±10%<br>M: ±20% |   |  |              |   |   |   |             |   |   |             |   |   |   |   |   |
| 330,000     | 334  |                    |   |   |              |   |   |   |             |   |   |             |   |  |   |   |   |
| 470,000     | 474  |                    |   |   |              |  |   |   |             |   |   |             |   |   |   |   |   |
| 680,000     | 684  |                    |   |   |              |   |  |   |             |   |   |             |   |   |  |   |   |
| 1,000,000   | 105  |                    |   |   |              |  |  |   |             |   |   |             |   |   |   |  |   |
| 1,500,000   | 155  |                    |   |   |              |   |   |   |             |   |   |             |   |   |   |   |  |
| 2,200,000   | 225  |                    |   |   |              |   |  |   |             |   |   |             |   |   |   |   |   |
| 3,300,000   | 335  |                    |   |   |              |   |   |   |             |   |   |             |   |   |   |   |   |
| 4,700,000   | 475  |                    |   |   |              |   |   |  |             |   |   |             |   |   |   |   |   |
| 6,800,000   | 685  |                    |   |   |              |   |   |   |             |   |  |             |   |   |   |   |   |
| 10,000,000  | 106  |                    |   |   |              |   |   |   |             |  |   |             |  |   |   |   |   |
| 15,000,000  | 156  |                    | M: ±20%   |   |              |   |   |   |             |   |    |             |   |   |   |   |   |
| 22,000,000  | 226  |                    |   |   |              |   |   |   |             |   |   |             |   |   |   |   |   |
| 47,000,000  | 476  |                    |   |   |              |   |   |   |             |   |   |             |   |  |   |   |   |

Standard thickness  3.35 mm

■ Please refer to the capacitance range table after P-9 for the details such as product thickness and capacitance tolerance.

## Capacitance range chart

## CKG45N/ 4532 [1812 inch], Stacked type

| Capacitance |      | Tolerance     | C0G          |              |              | X5R         |             | X7R          |              |              |             |             |             |
|-------------|------|---------------|--------------|--------------|--------------|-------------|-------------|--------------|--------------|--------------|-------------|-------------|-------------|
| (pF)        | Code |               | 2J<br>(630V) | 2W<br>(450V) | 2E<br>(250V) | 1H<br>(50V) | 1C<br>(16V) | 2J<br>(630V) | 2E<br>(250V) | 2A<br>(100V) | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) |
| 66,000      | 663  | J: $\pm 5\%$  | ■            |              |              |             |             |              |              |              |             |             |             |
| 94,000      | 943  |               |              | ■            |              |             |             |              |              |              |             |             |             |
| 140,000     | 144  | K: $\pm 10\%$ |              |              | ■            |             |             |              |              |              |             |             |             |
| 220,000     | 224  |               |              |              |              |             |             | ■            |              |              |             |             |             |
| 470,000     | 474  | M: $\pm 20\%$ |              |              |              |             |             |              |              |              |             |             |             |
| 1,000,000   | 105  |               |              |              |              |             |             |              | ■            |              |             |             |             |
| 2,200,000   | 225  |               |              |              |              |             |             |              |              | ■            |             |             |             |
| 3,300,000   | 335  |               |              |              |              |             |             |              |              |              | ■           |             |             |
| 4,700,000   | 475  |               |              |              |              |             |             |              |              |              |             | ■           |             |
| 6,800,000   | 685  |               |              |              |              |             |             |              |              |              |             |             | ■           |
| 10,000,000  | 106  |               |              |              |              |             | ■           |              |              |              |             |             |             |
| 22,000,000  | 226  |               |              |              |              |             |             |              |              |              |             |             | ■           |
| 47,000,000  | 476  |               |              |              |              |             |             | ■            |              |              |             |             |             |

| Capacitance |      | Tolerance     | X7S          |             |             | X7T          |              |              |
|-------------|------|---------------|--------------|-------------|-------------|--------------|--------------|--------------|
| (pF)        | Code |               | 2A<br>(100V) | 1H<br>(50V) | 1C<br>(16V) | 2J<br>(630V) | 2W<br>(450V) | 2E<br>(250V) |
| 330,000     | 334  | M: $\pm 20\%$ |              |             |             | ■            |              |              |
| 470,000     | 474  |               |              |             |             |              | ■            |              |
| 680,000     | 684  |               |              |             |             |              |              | ■            |
| 1,000,000   | 105  |               |              |             |             |              |              |              |
| 1,500,000   | 155  |               |              |             |             |              |              | ■            |
| 2,200,000   | 225  |               |              |             |             |              |              |              |
| 6,800,000   | 685  |               |              | ■           |             |              |              |              |
| 10,000,000  | 106  |               |              |             | ■           |              |              |              |
| 47,000,000  | 476  |               |              |             |             |              |              | ■            |

Standard thickness

 5.00 mm

■ Please refer to the capacitance range table after P-9 for the details such as product thickness and capacitance tolerance.

## Capacitance range chart

## CKG57N/ 5750 [2220 inch], Stacked type

| Capacitance |      | Tolerance | C0G          |              |              |             | X5R         |             |              | X7R          |              |             |             |             |  |
|-------------|------|-----------|--------------|--------------|--------------|-------------|-------------|-------------|--------------|--------------|--------------|-------------|-------------|-------------|--|
| (pF)        | Code |           | 2J<br>(630V) | 2E<br>(250V) | 2A<br>(100V) | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) | 2J<br>(630V) | 2E<br>(250V) | 2A<br>(100V) | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) |  |
| 140,000     | 144  | K: ±10%   | ■            |              |              |             |             |             |              |              |              |             |             |             |  |
| 300,000     | 304  | J: ±5%    |              | ■            |              |             |             |             |              |              |              |             |             |             |  |
| 470,000     | 474  | M: ±20%   |              |              |              |             |             | ■           |              |              |              |             |             |             |  |
| 1,000,000   | 105  |           |              |              |              |             |             |             | ■            |              |              |             |             |             |  |
| 2,200,000   | 225  |           |              |              |              |             |             |             | ■            | ■            |              |             |             |             |  |
| 4,700,000   | 475  |           |              |              |              |             |             |             |              | ■            | ■            |             |             |             |  |
| 10,000,000  | 106  |           |              |              | ■            |             |             |             |              |              | ■            | ■           |             |             |  |
| 22,000,000  | 226  |           |              |              |              | ■           |             |             |              |              |              |             | ■           |             |  |
| 33,000,000  | 336  |           |              |              |              |             |             |             |              |              |              |             |             | ■           |  |
| 47,000,000  | 476  |           |              |              |              |             |             |             | ■            |              |              |             |             |             |  |
| 100,000,000 | 107  |           |              |              |              |             |             |             | ■            |              |              |             | ■           |             |  |

| Capacitance |      | Tolerance | X7S          |             |             |             | X7T          |              |              |
|-------------|------|-----------|--------------|-------------|-------------|-------------|--------------|--------------|--------------|
| (pF)        | Code |           | 2A<br>(100V) | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) | 2J<br>(630V) | 2W<br>(450V) | 2E<br>(250V) |
| 680,000     | 684  | M: ±20%   |              |             |             |             | ■            |              |              |
| 1,000,000   | 105  |           |              |             |             |             | ■            |              |              |
| 1,500,000   | 155  |           |              |             |             |             |              | ■            |              |
| 2,200,000   | 225  |           |              |             |             |             |              | ■            | ■            |
| 3,300,000   | 335  |           |              |             |             |             |              |              | ■            |
| 22,000,000  | 226  |           | ■            | ■           |             |             |              |              |              |
| 47,000,000  | 476  |           |              |             | ■           |             |              |              |              |
| 100,000,000 | 107  |           |              |             |             | ■           |              |              |              |

Standard thickness  
 5.00 mm

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

■ Please refer to the capacitance range table after P-9 for the details such as product thickness and capacitance tolerance.



## 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: 1kV | Rated voltage Edc: 630V | Rated voltage Edc: 450V | Rated voltage Edc: 250V | Rated voltage Edc: 100V |
| 1nF         | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A102J335AH   |                         |                         |                         |                         |
| 1.2nF       | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A122J335AH   |                         |                         |                         |                         |
| 1.5nF       | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A152J335AH   |                         |                         |                         |                         |
| 1.8nF       | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A182J335AH   |                         |                         |                         |                         |
| 2.2nF       | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A222J335AH   |                         |                         |                         |                         |
| 2.7nF       | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A272J335AH   |                         |                         |                         |                         |
| 3.3nF       | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A332J335AH   |                         |                         |                         |                         |
| 3.9nF       | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A392J335AH   |                         |                         |                         |                         |
| 4.7nF       | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A472J335AH   |                         |                         |                         |                         |
| 5.6nF       | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A562J335AH   |                         |                         |                         |                         |
| 6.8nF       | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A682J335AH   |                         |                         |                         |                         |
| 8.2nF       | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A822J335AH   |                         |                         |                         |                         |
| 10nF        | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A103J335AH   |                         |                         |                         |                         |
| 15nF        | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A153J335AH   |                         |                         |                         |                         |
| 22nF        | 3225       | 3.35±0.10      | ±5%                   | CKG32KC0G3A223J335AH   | CKG32KC0G2J223J335AH    | CKG32KC0G2W223J335AH    |                         |                         |
| 33nF        | 3225       | 3.35±0.10      | ±5%                   |                        | CKG32KC0G2J333J335AH    | CKG32KC0G2W333J335AH    | CKG32KC0G2E333J335AH    |                         |
|             | 4532       | 2.90±0.10      | ±5%                   |                        | CKG45KC0G2J333J290JH    |                         |                         |                         |
| 47nF        | 3225       | 3.35±0.10      | ±5%                   |                        |                         |                         | CKG32KC0G2E473J335AH    |                         |
|             | 4532       | 2.90±0.10      | ±5%                   |                        |                         | CKG45KC0G2W473J290JH    |                         |                         |
| 66nF        | 4532       | 5.00±0.50      | ±5%                   |                        | CKG45NC0G2J663J500JH    |                         |                         |                         |
|             | 3225       | 3.35±0.10      | ±5%                   |                        |                         |                         |                         | CKG32KC0G2A663J335AH    |
| 68nF        | 4532       | 2.90±0.10      | ±5%                   |                        |                         |                         |                         | CKG45KC0G2E683J290JH    |
|             | 5750       | 3.35±0.15      | ±5%                   |                        | CKG57KC0G2J683J335JH    |                         |                         |                         |
| 94nF        | 4532       | 5.00±0.50      | ±5%                   |                        |                         | CKG45NC0G2W943J500JH    |                         |                         |
|             | 5750       | 5.00±0.50      | ±10%                  |                        |                         |                         | CKG45NC0G2E144K500JH    |                         |
| 140nF       | 4532       | 5.00±0.50      | ±10%                  |                        |                         |                         |                         | CKG45NC0G2E144K500JH    |
|             | 5750       | 5.00±0.50      | ±10%                  |                        | CKG57NC0G2J144K500JH    |                         |                         |                         |
| 150nF       | 5750       | 3.35±0.15      | ±5%                   |                        |                         |                         |                         | CKG57KC0G2E154J335JH    |
| 300nF       | 5750       | 5.00±0.50      | ±5%                   |                        |                         |                         |                         | CKG57NC0G2E304J500JH    |

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

## Capacitance range table

Temperature characteristics:  
X5R(-55 to +85°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 |
| 10μF        | 4532       | 5.00±0.50      | ±20%                  |                         | CKG45NX5R1H106M500JH   |                        |                        |
|             | 5750       | 5.00±0.50      | ±20%                  | CKG57NX5R2A106M500JH    |                        |                        |                        |
| 22μF        | 5750       | 5.00±0.50      | ±20%                  |                         | CKG57NX5R1H226M500JH   |                        |                        |
|             | 4532       | 5.00±0.50      | ±20%                  |                         |                        |                        | CKG45NX5R1C476M500JH   |
| 47μF        | 5750       | 5.00±0.50      | ±20%                  |                         |                        | CKG57NX5R1E476M500JH   |                        |
|             | 100μF      | 5750           | 5.00±0.50             | ±20%                    |                        |                        | CKG57NX5R1C107M500JH   |

■ 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: 630V | Rated voltage Edc: 250V | Rated voltage Edc: 100V | Rated voltage Edc: 50V |
| 47nF        | 3225       | 3.35±0.10      | ±10%                  | CKG32KX7R2J473K335AH    |                         |                         |                        |
|             |            |                | ±20%                  | CKG32KX7R2J473M335AH    |                         |                         |                        |
| 100nF       | 3225       | 3.35±0.10      | ±10%                  |                         | CKG32KX7R2E104K335AH    |                         |                        |
|             |            |                | ±20%                  |                         | CKG32KX7R2E104M335AH    |                         |                        |
|             | 4532       | 2.90±0.10      | ±10%                  | CKG45KX7R2J104K290JH    |                         |                         |                        |
|             |            |                | ±20%                  | CKG45KX7R2J104M290JH    |                         |                         |                        |
| 220nF       | 3225       | 3.35±0.10      | ±10%                  |                         | CKG32KX7R2E224K335AH    |                         |                        |
|             |            |                | ±20%                  |                         | CKG32KX7R2E224M335AH    |                         |                        |
|             | 4532       | 2.90±0.10      | ±10%                  |                         | CKG45KX7R2E224K290JH    |                         |                        |
|             |            |                | ±20%                  |                         | CKG45KX7R2E224M290JH    |                         |                        |
|             | 5750       | 3.35±0.15      | ±10%                  | CKG45NX7R2J224M500JH    |                         |                         |                        |
|             |            |                | ±20%                  | CKG57KX7R2J224K335JH    |                         |                         |                        |
|             |            |                | ±20%                  | CKG57KX7R2J224M335JH    |                         |                         |                        |
| 470nF       | 3225       | 3.35±0.10      | ±10%                  |                         |                         | CKG32KX7R2A474K335AH    |                        |
|             |            |                | ±20%                  |                         |                         | CKG32KX7R2A474M335AH    |                        |
|             | 4532       | 2.90±0.10      | ±10%                  |                         | CKG45KX7R2E474K290JH    |                         |                        |
|             |            |                | ±20%                  |                         | CKG45KX7R2E474M290JH    |                         |                        |
|             | 5750       | 3.35±0.15      | ±10%                  |                         | CKG45NX7R2E474M500JH    |                         |                        |
|             |            |                | ±20%                  |                         | CKG57KX7R2E474K335JH    |                         |                        |
|             |            |                | ±20%                  | CKG57KX7R2E474M335JH    |                         |                         |                        |
| 1µF         | 3225       | 3.35±0.10      | ±10%                  |                         |                         | CKG32KX7R2A105K335AH    | CKG32KX7R1H105K335AH   |
|             |            |                | ±20%                  |                         |                         | CKG32KX7R2A105M335AH    | CKG32KX7R1H105M335AH   |
|             | 4532       | 2.90±0.10      | ±10%                  |                         |                         | CKG45KX7R2A105K290JH    |                        |
|             |            |                | ±20%                  |                         |                         | CKG45KX7R2A105M290JH    |                        |
|             | 5750       | 3.35±0.15      | ±10%                  |                         | CKG45NX7R2E105M500JH    |                         |                        |
|             |            |                | ±20%                  |                         | CKG57KX7R2E105K335JH    | CKG57KX7R2A105K335JH    |                        |
|             |            |                | ±20%                  | CKG57KX7R2E105M335JH    | CKG57KX7R2A105M335JH    |                         |                        |
| 1.5µF       | 4532       | 2.90±0.10      | ±10%                  |                         |                         |                         | CKG45KX7R1H155K290JH   |
|             |            |                | ±20%                  |                         |                         |                         | CKG45KX7R1H155M290JH   |
| 2.2µF       | 3225       | 3.35±0.10      | ±10%                  |                         |                         | CKG32KX7R2A225K335AH    |                        |
|             |            |                | ±20%                  |                         |                         | CKG32KX7R2A225M335AH    |                        |
|             | 4532       | 2.90±0.10      | ±10%                  |                         |                         | CKG45KX7R2A225K290JH    |                        |
|             |            |                | ±20%                  |                         |                         | CKG45KX7R2A225M290JH    |                        |
|             | 5750       | 3.35±0.15      | ±10%                  |                         |                         | CKG45NX7R2A225M500JH    |                        |
|             |            |                | ±20%                  |                         |                         | CKG57KX7R2A225K335JH    |                        |
|             |            |                | ±20%                  |                         | CKG57KX7R2A225M335JH    |                         |                        |
|             |            |                |                       | ±20%                    | CKG57NX7R2E225M500JH    | CKG57NX7R2A225M500JH    |                        |

⚠ 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: X7R(-55 to +125°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 |
| 3.3µF       | 4532       | 2.90±0.10      | ±10%                  |                         | CKG45KX7R1H335K290JH   |                        |                        |
|             |            |                | ±20%                  |                         | CKG45KX7R1H335M290JH   |                        |                        |
|             | 5.00±0.50  | ±20%           |                       | CKG45NX7R1H335M500JH    |                        |                        |                        |
|             | 5750       | 3.35±0.15      | ±10%                  | CKG57KX7R2A335K335JH    |                        |                        |                        |
|             |            | ±20%           | CKG57KX7R2A335M335JH  |                         |                        |                        |                        |
| 4.7µF       | 3225       | 3.35±0.10      | ±10%                  |                         |                        | CKG32KX7R1E475K335AH   |                        |
|             |            |                | ±20%                  |                         |                        | CKG32KX7R1E475M335AH   |                        |
|             | 4532       | 2.90±0.10      | ±10%                  |                         |                        | CKG45KX7R1E475K290JH   |                        |
|             |            |                | ±20%                  |                         |                        | CKG45KX7R1E475M290JH   |                        |
|             |            | 5.00±0.50      | ±20%                  | CKG45NX7R2A475M500JH    |                        |                        |                        |
|             | 5750       | 3.35±0.15      | ±10%                  | CKG57KX7R2A475K335JH    | CKG57KX7R1H475K335JH   |                        |                        |
|             |            |                | ±20%                  | CKG57KX7R2A475M335JH    | CKG57KX7R1H475M335JH   |                        |                        |
|             |            | 5.00±0.50      | ±20%                  | CKG57NX7R2A475M500JH    |                        |                        |                        |
| 6.8µF       | 4532       | 5.00±0.50      | ±20%                  |                         | CKG45NX7R1H685M500JH   |                        |                        |
|             |            | 3225           | 3.35±0.10             | ±10%                    |                        |                        | CKG32KX7R1E106K335AH   |
|             |            |                | ±20%                  |                         |                        | CKG32KX7R1E106M335AH   |                        |
|             | 10µF       | 4532           | 2.90±0.10             | ±10%                    |                        |                        |                        |
|             |            |                | ±20%                  |                         |                        |                        | CKG45KX7R1C106M290JH   |
|             |            | 5.00±0.50      | ±20%                  |                         |                        | CKG45NX7R1E106M500JH   |                        |
| 5750        |            | 3.35±0.15      | ±10%                  |                         |                        | CKG57KX7R1E106K335JH   |                        |
|             |            | ±20%           |                       |                         | CKG57KX7R1E106M335JH   |                        |                        |
| 15µF        | 5750       | 3.35±0.15      | ±20%                  |                         |                        |                        | CKG57KX7R1C156M335JH   |
|             |            |                | ±20%                  |                         |                        |                        | CKG45KX7R1C226M290JH   |
| 22µF        | 4532       | 2.90±0.10      | ±20%                  |                         |                        |                        | CKG45NX7R1C226M500JH   |
|             |            |                | ±20%                  |                         |                        |                        |                        |
| 33µF        | 5750       | 5.00±0.50      | ±20%                  |                         |                        | CKG57KX7R1E226M335JH   |                        |
|             |            |                | ±20%                  |                         |                        | CKG57NX7R1E226M500JH   |                        |
| 47µF        | 5750       | 5.00±0.50      | ±20%                  |                         |                        |                        | CKG57NX7R1C336M500JH   |
|             |            |                | ±20%                  |                         |                        |                        |                        |
| 100µF       | 5750       | 5.00±0.50      | ±20%                  |                         |                        | CKG57KX7R1E476M335JH   |                        |
|             |            |                |                       |                         |                        | CKG57NX7R1E107M500JH   |                        |

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

## Capacitance range table

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

| Capacitance | Dimensions | Thickness (mm) | Capacitance tolerance | Catalog number          |                        |                        |                        |
|-------------|------------|----------------|-----------------------|-------------------------|------------------------|------------------------|------------------------|
|             |            |                |                       | Rated voltage Edc: 100V | Rated voltage Edc: 50V | Rated voltage Edc: 25V | Rated voltage Edc: 16V |
| 3.3µF       | 3225       | 3.35±0.10      | ±10%                  | CKG32KX7S2A335K335AH    |                        |                        |                        |
|             |            |                | ±20%                  | CKG32KX7S2A335M335AH    |                        |                        |                        |
|             | 4532       | 2.90±0.10      | ±10%                  | CKG45KX7S2A335K290JH    |                        |                        |                        |
|             |            |                | ±20%                  | CKG45KX7S2A335M290JH    |                        |                        |                        |
| 4.7µF       | 3225       | 3.35±0.10      | ±10%                  | CKG32KX7S2A475K335AH    | CKG32KX7S1H475K335AH   |                        |                        |
|             |            |                | ±20%                  | CKG32KX7S2A475M335AH    | CKG32KX7S1H475M335AH   |                        |                        |
|             | 4532       | 2.90±0.10      | ±10%                  | CKG45KX7S2A475K290JH    | CKG45KX7S1H475K290JH   |                        |                        |
|             |            |                | ±20%                  | CKG45KX7S2A475M290JH    | CKG45KX7S1H475M290JH   |                        |                        |
| 6.8µF       | 3225       | 3.35±0.10      | ±10%                  |                         | CKG32KX7S1H685K335AH   |                        |                        |
|             |            |                | ±20%                  |                         | CKG32KX7S1H685M335AH   |                        |                        |
|             | 4532       | 5.00±0.50      | ±20%                  | CKG45NX7S2A685M500JH    |                        |                        |                        |
|             |            |                | ±10%                  | CKG57KX7S2A685K335JH    |                        |                        |                        |
| 5750        | 3.35±0.15  | ±20%           | CKG57KX7S2A685M335JH  |                         |                        |                        |                        |
|             |            |                | ±20%                  |                         |                        |                        |                        |
| 10µF        | 3225       | 3.35±0.10      | ±10%                  |                         | CKG32KX7S1H106K335AH   |                        |                        |
|             |            |                | ±20%                  |                         | CKG32KX7S1H106M335AH   |                        |                        |
|             | 4532       | 5.00±0.50      | ±20%                  | CKG45NX7S2A106M500JH    | CKG45NX7S1H106M500JH   |                        |                        |
|             |            |                | ±10%                  | CKG57KX7S2A106K335JH    | CKG57KX7S1H106K335JH   |                        |                        |
| 5750        | 3.35±0.15  | ±20%           | CKG57KX7S2A106M335JH  | CKG57KX7S1H106M335JH    |                        |                        |                        |
|             |            |                | ±20%                  |                         |                        |                        |                        |
| 15µF        | 5750       | 3.35±0.15      | ±20%                  | CKG57KX7S2A156M335JH    |                        |                        |                        |
| 22µF        | 4532       | 2.90±0.10      | ±20%                  |                         |                        |                        | CKG45KX7S1C226M290JH   |
|             |            |                | ±20%                  |                         |                        |                        |                        |
| 47µF        | 5750       | 5.00±0.50      | ±20%                  | CKG57NX7S2A226M500JH    | CKG57NX7S1H226M500JH   |                        |                        |
|             |            |                | ±20%                  |                         |                        |                        | CKG45NX7S1C476M500JH   |
| 100µF       | 5750       | 3.35±0.15      | ±20%                  |                         |                        |                        | CKG57KX7S1C476M335JH   |
|             |            |                | ±20%                  |                         |                        |                        |                        |
|             |            | 5.00±0.50      | ±20%                  |                         |                        | CKG57NX7S1E476M500JH   |                        |
|             |            |                | ±20%                  |                         |                        |                        | CKG57NX7S1C107M500JH   |

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## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

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

| Capacitance | Dimensions | Thickness (mm) | Capacitance tolerance | Catalog number          |                         |                         |                      |
|-------------|------------|----------------|-----------------------|-------------------------|-------------------------|-------------------------|----------------------|
|             |            |                |                       | Rated voltage Edc: 630V | Rated voltage Edc: 450V | Rated voltage Edc: 250V |                      |
| 100nF       | 3225       | 3.35±0.10      | ±10%                  | CKG32KX7T2J104K335AH    |                         |                         |                      |
|             |            |                | ±20%                  | CKG32KX7T2J104M335AH    |                         |                         |                      |
| 150nF       | 3225       | 3.35±0.10      | ±10%                  | CKG32KX7T2J154K335AH    |                         |                         |                      |
|             |            |                | ±20%                  | CKG32KX7T2J154M335AH    |                         |                         |                      |
|             | 4532       | 2.90±0.10      | ±10%                  | CKG45KX7T2J154K290JH    |                         |                         |                      |
|             |            |                | ±20%                  | CKG45KX7T2J154M290JH    |                         |                         |                      |
| 220nF       | 3225       | 3.35±0.10      | ±10%                  |                         | CKG32KX7T2W224K335AH    |                         |                      |
|             |            |                | ±20%                  |                         | CKG32KX7T2W224M335AH    |                         |                      |
|             | 4532       | 2.90±0.10      | ±10%                  | CKG45KX7T2J224K290JH    |                         |                         |                      |
|             |            |                | ±20%                  | CKG45KX7T2J224M290JH    |                         |                         |                      |
| 330nF       | 3225       | 3.35±0.10      | ±10%                  |                         |                         | CKG32KX7T2E334K335AH    |                      |
|             |            |                | ±20%                  |                         |                         | CKG32KX7T2E334M335AH    |                      |
|             | 4532       | 2.90±0.10      | ±10%                  |                         | CKG45KX7T2W334K290JH    |                         |                      |
|             |            |                | ±20%                  |                         | CKG45KX7T2W334M290JH    |                         |                      |
|             | 5750       | 3.35±0.15      | ±10%                  | CKG45NX7T2J334M500JH    |                         |                         |                      |
|             |            |                | ±20%                  | CKG57KX7T2J334K335JH    |                         |                         |                      |
| 470nF       | 4532       | 2.90±0.10      | ±10%                  |                         | CKG45KX7T2W474K290JH    |                         |                      |
|             |            |                | ±20%                  |                         | CKG45KX7T2W474M290JH    |                         |                      |
|             | 5750       | 3.35±0.15      | ±10%                  | CKG45NX7T2J474M500JH    |                         |                         |                      |
|             |            |                | ±20%                  | CKG57KX7T2J474K335JH    |                         |                         |                      |
|             | 680nF      | 4532           | 2.90±0.10             | ±10%                    |                         |                         | CKG45KX7T2E684K290JH |
|             |            |                |                       | ±20%                    |                         |                         | CKG45KX7T2E684M290JH |
| 5750        |            | 3.35±0.15      | ±10%                  |                         | CKG45NX7T2W684M500JH    |                         |                      |
|             |            |                | ±20%                  |                         | CKG57KX7T2W684K335JH    |                         |                      |
| 1µF         | 4532       | 2.90±0.10      | ±10%                  |                         |                         | CKG45KX7T2E105K290JH    |                      |
|             |            |                | ±20%                  |                         |                         | CKG45KX7T2E105M290JH    |                      |
|             | 5750       | 3.35±0.15      | ±10%                  |                         | CKG45NX7T2W105M500JH    |                         |                      |
|             |            |                | ±20%                  |                         | CKG57KX7T2W105K335JH    |                         |                      |
|             | 5750       | 5.00±0.50      | ±10%                  | CKG57KX7T2J105M500JH    |                         |                         |                      |
|             |            |                | ±20%                  | CKG57NX7T2J105M500JH    |                         |                         |                      |
| 1.5µF       | 4532       | 5.00±0.50      | ±10%                  |                         |                         | CKG45NX7T2E155M500JH    |                      |
|             |            |                | ±20%                  |                         |                         | CKG57KX7T2E155K335JH    |                      |
|             | 5750       | 3.35±0.15      | ±10%                  |                         |                         | CKG57KX7T2E155M335JH    |                      |
|             |            |                | ±20%                  |                         | CKG57NX7T2W155M500JH    |                         |                      |
| 2.2µF       | 4532       | 5.00±0.50      | ±10%                  |                         |                         | CKG45NX7T2E225M500JH    |                      |
|             |            |                | ±20%                  |                         |                         | CKG57KX7T2E225K335JH    |                      |
|             | 5750       | 3.35±0.15      | ±10%                  |                         |                         | CKG57KX7T2E225M335JH    |                      |
|             |            |                | ±20%                  |                         | CKG57NX7T2W225M500JH    |                         |                      |
| 3.3µF       | 5750       | 5.00±0.50      | ±20%                  |                         |                         | CKG57NX7T2E335M500JH    |                      |

⚠ 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.