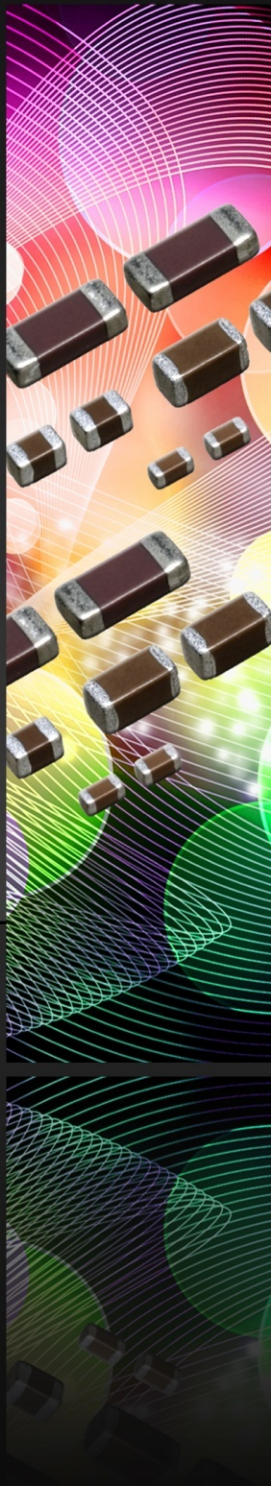




## MULTILAYER CERAMIC CHIP CAPACITORS



### CGJ Series Extended Life Capacitors

Type:

CGJ2 [EIA CC0402]  
CGJ3 [EIA CC0603]  
CGJ4 [EIA CC0805]  
CGJ5 [EIA CC1206]

Issue date:

December 2011

TDK MLCC  
US Catalog

Version B11

## REMINDERS

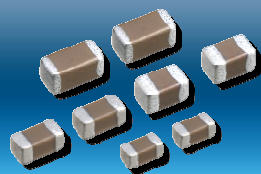
Please read before using this product

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## CGJ Series Extended Life Capacitors

Type: CGJ2 (C1005), CGJ3 (C1608),  
CGJ4 (C2012), CGJ5 (C3216)

### Features



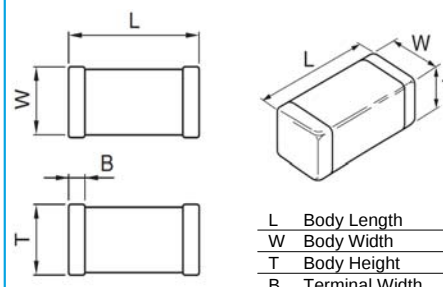
- Extended Life series capacitor featuring increased evaluation during manufacturing to promote longer life
- Life test performs at 2x rated voltage for 2000 hrs
- Reliability tests based on MIL-STD requirements
- Guaranteed TC Bias and Hot IR performance
- Anti-counterfeit/tamper-proof seal to assist in the identification of authentic TDK CGJ products. The condition of the seal also indicates if the product has been tampered with in the supply chain
- Certificate of Compliance (CofC) documentation is provided for each CGJ lot. Consumers of CGJ products can view each lot specific CofC on the TDK website
- Available optional UHF (Ultra High Frequency) RFID tag to allow integration with customer RFID programs such as inventory management
- CGJ customer priority backed by TDK factory support by 3/3/7 policy (3hrs: acknowledgement, 3 days: response with initial failure mode, 7 days: full failure analysis report)

### Applications



- Smart Meter
- Smart Grid
- Solar Inverters
- Charging station
- Applications that require extended life performance

### Shape & Dimension



Dimensions in mm



### Part Number Construction

CGJ 5 L 2 X7R 1A 106 K T XXXX

Series Name

Dimensions L x W (mm)

| Symbol | Length           | Width            |
|--------|------------------|------------------|
| 2      | 1.00 ± 0.05      | 0.50 ± 0.05      |
| 3      | 1.60 ± 0.10      | 0.80 ± 0.10      |
| 4      | 2.00 ± 0.20      | 1.25 ± 0.20      |
| 5      | 3.20 ± 0.20      | 1.60 ± 0.20      |
|        | 3.20 +0.30/-0.10 | 1.60 +0.30/-0.10 |

Thickness T (mm)

| Symbol | Thickness | Symbol | Thickness |
|--------|-----------|--------|-----------|
| B      | 0.50 mm   | H      | 1.15 mm   |
| C      | 0.60 mm   | J      | 1.25 mm   |
| E      | 0.80 mm   | L      | 1.60 mm   |
| F      | 0.85 mm   |        |           |

Voltage Condition for Life Test

| Symbol | Condition |
|--------|-----------|
| 2      | 2 × R.V.  |

Temperature Characteristic

| Temperature Characteristic | Capacitance Change | Temperature Range |
|----------------------------|--------------------|-------------------|
| COG                        | 0±30 ppm/°C        | -55 to +125°C     |
| X7R                        | ± 15%              | -55 to +125°C     |

Internal Codes

Packaging Style

| Packaging Code | Style       |
|----------------|-------------|
| T              | Tape & Reel |

Capacitance Tolerance

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

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.

| Capacitance Code | Capacitance       |
|------------------|-------------------|
| 0R5              | 0.5pF             |
| 010              | 1pF               |
| 102              | 1,000pF (1nF)     |
| 105              | 1,000,000pF (1μF) |

Rated Voltage (DC)

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



## Capacitance Range Chart

## CGJ2 [EIA CC0402]

### Capacitance Range Chart

Temperature Characteristics: C0G (0±30 ppm/°C)

Rated Voltage: 50V (1H)

| Capacitance (pF) | Cap Code | Tolerance | C0G<br>1H<br>(50V) |
|------------------|----------|-----------|--------------------|
| 100              | 101      | J: ± 5%   |                    |
| 120              | 121      |           |                    |
| 150              | 151      |           |                    |
| 180              | 181      |           |                    |
| 220              | 221      |           |                    |
| 270              | 271      |           |                    |
| 330              | 331      |           |                    |
| 390              | 391      |           |                    |
| 470              | 471      |           |                    |
| 560              | 561      |           |                    |
| 680              | 681      |           |                    |
| 820              | 821      |           |                    |
| 1000             | 102      |           |                    |

Standard Thickness  
0.50 mm

### Capacitance Range Chart

Temperature Characteristics: X7R (± 15%)

Rated Voltage: 50V (1H), 25V (1E), 16V (1C)

| Capacitance (pF) | Cap Code | Tolerance | X7R         |             |             |
|------------------|----------|-----------|-------------|-------------|-------------|
|                  |          |           | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) |
| 1,000            | 102      | K: ± 10%  |             |             |             |
| 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  
0.50 mm



## Capacitance Range Table

## CGJ2 [EIA CC0402]

### Class 1 (Temperature Compensating)

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

| TDK Part Number<br>(Ordering Code) | Temperature<br>Characteristics | Rated<br>Voltage | Capacitance<br>(pF) | Capacitance<br>Tolerance | Thickness<br>(mm) |
|------------------------------------|--------------------------------|------------------|---------------------|--------------------------|-------------------|
| CGJ2B2C0G1H101J                    | C0G                            | 50V              | 100                 | ± 5%                     | 0.50 ± 0.05       |
| CGJ2B2C0G1H121J                    | C0G                            | 50V              | 120                 | ± 5%                     | 0.50 ± 0.05       |
| CGJ2B2C0G1H151J                    | C0G                            | 50V              | 150                 | ± 5%                     | 0.50 ± 0.05       |
| CGJ2B2C0G1H181J                    | C0G                            | 50V              | 180                 | ± 5%                     | 0.50 ± 0.05       |
| CGJ2B2C0G1H221J                    | C0G                            | 50V              | 220                 | ± 5%                     | 0.50 ± 0.05       |
| CGJ2B2C0G1H271J                    | C0G                            | 50V              | 270                 | ± 5%                     | 0.50 ± 0.05       |
| CGJ2B2C0G1H331J                    | C0G                            | 50V              | 330                 | ± 5%                     | 0.50 ± 0.05       |
| CGJ2B2C0G1H391J                    | C0G                            | 50V              | 390                 | ± 5%                     | 0.50 ± 0.05       |
| CGJ2B2C0G1H471J                    | C0G                            | 50V              | 470                 | ± 5%                     | 0.50 ± 0.05       |
| CGJ2B2C0G1H561J                    | C0G                            | 50V              | 560                 | ± 5%                     | 0.50 ± 0.05       |
| CGJ2B2C0G1H681J                    | C0G                            | 50V              | 680                 | ± 5%                     | 0.50 ± 0.05       |
| CGJ2B2C0G1H821J                    | C0G                            | 50V              | 820                 | ± 5%                     | 0.50 ± 0.05       |
| CGJ2B2C0G1H102J                    | C0G                            | 50V              | 1,000               | ± 5%                     | 0.50 ± 0.05       |



## Capacitance Range Table

## CGJ2 [EIA CC0402]

### Class 2 (Temperature Stable)

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

| TDK Part Number<br>(Ordering Code) | Temperature<br>Characteristics | Rated<br>Voltage | Capacitance<br>(pF) | Capacitance<br>Tolerance | Thickness<br>(mm) |
|------------------------------------|--------------------------------|------------------|---------------------|--------------------------|-------------------|
| CGJ2B2X7R1H102K                    | X7R                            | 50V              | 1,000               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1H152K                    | X7R                            | 50V              | 1,500               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1H222K                    | X7R                            | 50V              | 2,200               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1H332K                    | X7R                            | 50V              | 3,300               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1H472K                    | X7R                            | 50V              | 4,700               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1H682K                    | X7R                            | 50V              | 6,800               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1E102K                    | X7R                            | 25V              | 1,000               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1E152K                    | X7R                            | 25V              | 1,500               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1E222K                    | X7R                            | 25V              | 2,200               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1E332K                    | X7R                            | 25V              | 3,300               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1E472K                    | X7R                            | 25V              | 4,700               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1E682K                    | X7R                            | 25V              | 6,800               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1E103K                    | X7R                            | 25V              | 10,000              | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1E153K                    | X7R                            | 25V              | 15,000              | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1E223K                    | X7R                            | 25V              | 22,000              | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1E333K                    | X7R                            | 25V              | 33,000              | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1E473K                    | X7R                            | 25V              | 47,000              | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C102K                    | X7R                            | 16V              | 1,000               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C152K                    | X7R                            | 16V              | 1,500               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C222K                    | X7R                            | 16V              | 2,200               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C332K                    | X7R                            | 16V              | 3,300               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C472K                    | X7R                            | 16V              | 4,700               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C682K                    | X7R                            | 16V              | 6,800               | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C103K                    | X7R                            | 16V              | 10,000              | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C153K                    | X7R                            | 16V              | 15,000              | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C223K                    | X7R                            | 16V              | 22,000              | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C333K                    | X7R                            | 16V              | 33,000              | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C473K                    | X7R                            | 16V              | 47,000              | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C683K                    | X7R                            | 16V              | 68,000              | ± 10%                    | 0.50 ± 0.05       |
| CGJ2B2X7R1C104K                    | X7R                            | 16V              | 100,000             | ± 10%                    | 0.50 ± 0.05       |



## Capacitance Range Chart

## CGJ3 [EIA CC0603]

### Capacitance Range Chart

Temperature Characteristics: C0G (0±30 ppm/°C)

Rated Voltage: 50V (1H)

| Capacitance (pF) | Cap Code | Tolerance | C0G<br>1H<br>(50V) |
|------------------|----------|-----------|--------------------|
| 270              | 271      | J: ± 5%   |                    |
| 330              | 331      |           |                    |
| 390              | 391      |           |                    |
| 470              | 471      |           |                    |
| 560              | 561      |           |                    |
| 680              | 681      |           |                    |
| 820              | 821      |           |                    |
| 1,000            | 102      |           |                    |
| 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      |           |                    |

Standard Thickness

 0.80 mm

### Capacitance Range Chart

Temperature Characteristics: X7R (± 15%)

Rated Voltage: 50V (1H), 25V (1E), 16V (1C), 10V (1A), 6.3V (0J)

| Capacitance (pF) | Cap Code | Tolerance | X7R         |             |             |             |              |
|------------------|----------|-----------|-------------|-------------|-------------|-------------|--------------|
|                  |          |           | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) | 1A<br>(10V) | 0J<br>(6.3V) |
| 10,000           | 103      | K: ± 10%  |             |             |             |             |              |
| 15,000           | 153      |           |             |             |             |             |              |
| 22,000           | 223      |           |             |             |             |             |              |
| 33,000           | 333      |           |             |             |             |             |              |
| 47,000           | 473      |           |             |             |             |             |              |
| 68,000           | 683      |           |             |             |             |             |              |
| 100,000          | 104      |           |             |             |             |             |              |
| 330,000          | 334      |           |             |             |             |             |              |
| 470,000          | 474      |           |             |             |             |             |              |
| 680,000          | 684      |           |             |             |             |             |              |
| 1,000,000        | 105      |           |             |             |             |             |              |

Standard Thickness

 0.80 mm



## Capacitance Range Table

## CGJ3 [EIA CC0603]

### Class 1 (Temperature Compensating)

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

| TDK Part Number<br>(Ordering Code) | Temperature<br>Characteristics | Rated<br>Voltage | Capacitance<br>(pF) | Capacitance<br>Tolerance | Thickness<br>(mm) |
|------------------------------------|--------------------------------|------------------|---------------------|--------------------------|-------------------|
| CGJ3E2C0G1H271J                    | C0G                            | 50V              | 270                 | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H331J                    | C0G                            | 50V              | 330                 | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H391J                    | C0G                            | 50V              | 390                 | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H471J                    | C0G                            | 50V              | 470                 | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H561J                    | C0G                            | 50V              | 560                 | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H681J                    | C0G                            | 50V              | 680                 | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H821J                    | C0G                            | 50V              | 820                 | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H102J                    | C0G                            | 50V              | 1,000               | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H122J                    | C0G                            | 50V              | 1,200               | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H152J                    | C0G                            | 50V              | 1,500               | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H182J                    | C0G                            | 50V              | 1,800               | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H222J                    | C0G                            | 50V              | 2,200               | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H272J                    | C0G                            | 50V              | 2,700               | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H332J                    | C0G                            | 50V              | 3,300               | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H392J                    | C0G                            | 50V              | 3,900               | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H472J                    | C0G                            | 50V              | 4,700               | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H562J                    | C0G                            | 50V              | 5,600               | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H682J                    | C0G                            | 50V              | 6,800               | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H822J                    | C0G                            | 50V              | 8,200               | ± 5%                     | 0.80 ± 0.07       |
| CGJ3E2C0G1H103J                    | C0G                            | 50V              | 10,000              | ± 5%                     | 0.80 ± 0.07       |



## Capacitance Range Table

## CGJ3 [EIA CC0603]

### Class 2 (Temperature Stable)

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

| TDK Part Number<br>(Ordering Code) | Temperature<br>Characteristics | Rated<br>Voltage | Capacitance<br>(pF) | Capacitance<br>Tolerance | Thickness<br>(mm) |
|------------------------------------|--------------------------------|------------------|---------------------|--------------------------|-------------------|
| CGJ3E2X7R1H103K                    | X7R                            | 50V              | 10,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1H153K                    | X7R                            | 50V              | 15,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1H223K                    | X7R                            | 50V              | 22,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1H333K                    | X7R                            | 50V              | 33,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1H473K                    | X7R                            | 50V              | 47,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1H683K                    | X7R                            | 50V              | 68,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1H104K                    | X7R                            | 50V              | 100,000             | ± 10%                    | 0.80 ± 0.10       |
| CGJ3E2X7R1E103K                    | X7R                            | 25V              | 10,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1E153K                    | X7R                            | 25V              | 15,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1E223K                    | X7R                            | 25V              | 22,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1E333K                    | X7R                            | 25V              | 33,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1E473K                    | X7R                            | 25V              | 47,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1E683K                    | X7R                            | 25V              | 68,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1E104K                    | X7R                            | 25V              | 100,000             | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1C103K                    | X7R                            | 16V              | 10,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1C153K                    | X7R                            | 16V              | 15,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1C223K                    | X7R                            | 16V              | 22,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1C333K                    | X7R                            | 16V              | 33,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1C473K                    | X7R                            | 16V              | 47,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1C683K                    | X7R                            | 16V              | 68,000              | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1C104K                    | X7R                            | 16V              | 100,000             | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1A334K                    | X7R                            | 10V              | 330,000             | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1A474K                    | X7R                            | 10V              | 470,000             | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1A684K                    | X7R                            | 10V              | 680,000             | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R1A105K                    | X7R                            | 10V              | 1,000,000           | ± 10%                    | 0.80 ± 0.10       |
| CGJ3E2X7R0J334K                    | X7R                            | 6.3V             | 330,000             | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R0J474K                    | X7R                            | 6.3V             | 470,000             | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R0J684K                    | X7R                            | 6.3V             | 680,000             | ± 10%                    | 0.80 ± 0.07       |
| CGJ3E2X7R0J105K                    | X7R                            | 6.3V             | 1,000,000           | ± 10%                    | 0.80 ± 0.10       |



## Capacitance Range Chart

## CGJ4 [EIA CC0805]

### Capacitance Range Chart

Temperature Characteristics: C0G (0±30 ppm/°C)  
 Rated Voltage: 50V (1H)

| Capacitance (pF) | Cap Code | Tolerance | C0G<br>1H<br>(50V) |
|------------------|----------|-----------|--------------------|
| 680              | 681      | J: ± 5%   |                    |
| 820              | 821      |           |                    |
| 1,000            | 102      |           |                    |
| 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      |           |                    |

**Standard Thickness**

- 0.60 mm
- 0.85 mm
- 1.25 mm

### Capacitance Range Chart

Temperature Characteristics: X7R (± 15%)  
 Rated Voltage: 50V (1H), 25V (1E), 16V (1C), 10V (1A), 6.3V (0J)

| Capacitance (pF) | Cap Code | Tolerance | X7R         |             |             |             |              |
|------------------|----------|-----------|-------------|-------------|-------------|-------------|--------------|
|                  |          |           | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) | 1A<br>(10V) | 0J<br>(6.3V) |
| 33,000           | 333      | K: ± 10%  |             |             |             |             |              |
| 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      |           |             |             |             |             |              |

**Standard Thickness**

- 1.25 mm



## Capacitance Range Table

## CGJ4 [EIA CC0805]

### Class 1 (Temperature Compensating)

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

| TDK Part Number<br>(Ordering Code) | Temperature<br>Characteristics | Rated<br>Voltage | Capacitance<br>(pF) | Capacitance<br>Tolerance | Thickness<br>(mm) |
|------------------------------------|--------------------------------|------------------|---------------------|--------------------------|-------------------|
| CGJ4C2C0G1H681J                    | C0G                            | 50V              | 680                 | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H821J                    | C0G                            | 50V              | 820                 | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H102J                    | C0G                            | 50V              | 1,000               | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H122J                    | C0G                            | 50V              | 1,200               | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H152J                    | C0G                            | 50V              | 1,500               | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H182J                    | C0G                            | 50V              | 1,800               | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H222J                    | C0G                            | 50V              | 2,200               | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H272J                    | C0G                            | 50V              | 2,700               | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H332J                    | C0G                            | 50V              | 3,300               | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H392J                    | C0G                            | 50V              | 3,900               | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H472J                    | C0G                            | 50V              | 4,700               | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H562J                    | C0G                            | 50V              | 5,600               | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H682J                    | C0G                            | 50V              | 6,800               | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H822J                    | C0G                            | 50V              | 8,200               | ± 5%                     | 0.60 ± 0.10       |
| CGJ4C2C0G1H103J                    | C0G                            | 50V              | 10,000              | ± 5%                     | 0.60 ± 0.10       |
| CGJ4F2C0G1H153J                    | C0G                            | 50V              | 15,000              | ± 5%                     | 0.85 +0.02/-0.10  |
| CGJ4J2C0G1H223J                    | C0G                            | 50V              | 22,000              | ± 5%                     | 1.25 ± 0.10       |
| CGJ4J2C0G1H333J                    | C0G                            | 50V              | 33,000              | ± 5%                     | 1.25 ± 0.20       |



## Capacitance Range Table

## CGJ4 [EIA CC0805]

### Class 2 (Temperature Stable)

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

| TDK Part Number<br>(Ordering Code) | Temperature<br>Characteristics | Rated<br>Voltage | Capacitance<br>(pF) | Capacitance<br>Tolerance | Thickness<br>(mm) |
|------------------------------------|--------------------------------|------------------|---------------------|--------------------------|-------------------|
| CGJ4J2X7R1H333K                    | X7R                            | 50V              | 33,000              | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1H473K                    | X7R                            | 50V              | 47,000              | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1H683K                    | X7R                            | 50V              | 68,000              | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1H104K                    | X7R                            | 50V              | 100,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1H154K                    | X7R                            | 50V              | 150,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1H224K                    | X7R                            | 50V              | 220,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1H334K                    | X7R                            | 50V              | 330,000             | ± 10%                    | 1.25 ± 0.20       |
| CGJ4J2X7R1E333K                    | X7R                            | 25V              | 33,000              | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1E473K                    | X7R                            | 25V              | 47,000              | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1E683K                    | X7R                            | 25V              | 68,000              | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1E104K                    | X7R                            | 25V              | 100,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1E154K                    | X7R                            | 25V              | 150,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1E224K                    | X7R                            | 25V              | 220,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1E334K                    | X7R                            | 25V              | 330,000             | ± 10%                    | 1.25 ± 0.20       |
| CGJ4J2X7R1E474K                    | X7R                            | 25V              | 470,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1E684K                    | X7R                            | 25V              | 680,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1E105K                    | X7R                            | 25V              | 1,000,000           | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1C333K                    | X7R                            | 16V              | 33,000              | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1C473K                    | X7R                            | 16V              | 47,000              | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1C683K                    | X7R                            | 16V              | 68,000              | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1C104K                    | X7R                            | 16V              | 100,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1C154K                    | X7R                            | 16V              | 150,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1C224K                    | X7R                            | 16V              | 220,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1C334K                    | X7R                            | 16V              | 330,000             | ± 10%                    | 1.25 ± 0.20       |
| CGJ4J2X7R1C474K                    | X7R                            | 16V              | 470,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1C684K                    | X7R                            | 16V              | 680,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1C105K                    | X7R                            | 16V              | 1,000,000           | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1A224K                    | X7R                            | 10V              | 220,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1A334K                    | X7R                            | 10V              | 330,000             | ± 10%                    | 1.25 ± 0.20       |
| CGJ4J2X7R1A474K                    | X7R                            | 10V              | 470,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1A684K                    | X7R                            | 10V              | 680,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1A105K                    | X7R                            | 10V              | 1,000,000           | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1A155K                    | X7R                            | 10V              | 1,500,000           | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1A225K                    | X7R                            | 10V              | 2,200,000           | ± 10%                    | 1.25 ± 0.20       |
| CGJ4J2X7R1A335K                    | X7R                            | 10V              | 3,300,000           | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R1A475K                    | X7R                            | 10V              | 4,700,000           | ± 10%                    | 1.25 ± 0.20       |
| CGJ4J2X7R0J224K                    | X7R                            | 6.3V             | 220,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R0J334K                    | X7R                            | 6.3V             | 330,000             | ± 10%                    | 1.25 ± 0.20       |
| CGJ4J2X7R0J474K                    | X7R                            | 6.3V             | 470,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R0J684K                    | X7R                            | 6.3V             | 680,000             | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R0J105K                    | X7R                            | 6.3V             | 1,000,000           | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R0J155K                    | X7R                            | 6.3V             | 1,500,000           | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R0J225K                    | X7R                            | 6.3V             | 2,200,000           | ± 10%                    | 1.25 ± 0.20       |
| CGJ4J2X7R0J335K                    | X7R                            | 6.3V             | 3,300,000           | ± 10%                    | 1.25 ± 0.10       |
| CGJ4J2X7R0J475K                    | X7R                            | 6.3V             | 4,700,000           | ± 10%                    | 1.25 ± 0.20       |



## Capacitance Range Chart

## CGJ5 [EIA CC1206]

### Capacitance Range Chart

Temperature Characteristics: C0G (0±30 ppm/°C)

Rated Voltage: 50V (1H)

| Capacitance (pF) | Cap Code | Tolerance | C0G<br>1H<br>(50V) |
|------------------|----------|-----------|--------------------|
| 3,900            | 392      | J: ± 5%   |                    |
| 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      |           |                    |

#### Standard Thickness

|  |         |
|--|---------|
|  | 0.60 mm |
|  | 0.85 mm |
|  | 1.15 mm |
|  | 1.60 mm |

### Capacitance Range Chart

Temperature Characteristics: X7R (± 15%)

Rated Voltage: 25V (1E), 16V (1C), 10V (1A), 6.3V (0J)

| Capacitance (pF) | Cap Code | Tolerance | X7R         |             |             |              |
|------------------|----------|-----------|-------------|-------------|-------------|--------------|
|                  |          |           | 1E<br>(25V) | 1C<br>(16V) | 1A<br>(10V) | 0J<br>(6.3V) |
| 1,500,000        | 155      | K: ± 10%  |             |             |             |              |
| 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 |
|--|---------|



## Capacitance Range Table

## CGJ5 [EIA CC1206]

### Class 1 (Temperature Compensating)

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

| TDK Part Number<br>(Ordering Code) | Temperature<br>Characteristics | Rated<br>Voltage | Capacitance<br>(pF) | Capacitance<br>Tolerance | Thickness<br>(mm) |
|------------------------------------|--------------------------------|------------------|---------------------|--------------------------|-------------------|
| CGJ5C2C0G1H392J                    | C0G                            | 50V              | 3,900               | ± 5%                     | 0.60 ± 0.10       |
| CGJ5C2C0G1H472J                    | C0G                            | 50V              | 4,700               | ± 5%                     | 0.60 ± 0.10       |
| CGJ5C2C0G1H562J                    | C0G                            | 50V              | 5,600               | ± 5%                     | 0.60 ± 0.10       |
| CGJ5C2C0G1H682J                    | C0G                            | 50V              | 6,800               | ± 5%                     | 0.60 ± 0.10       |
| CGJ5C2C0G1H822J                    | C0G                            | 50V              | 8,200               | ± 5%                     | 0.60 ± 0.10       |
| CGJ5C2C0G1H103J                    | C0G                            | 50V              | 10,000              | ± 5%                     | 0.60 ± 0.10       |
| CGJ5C2C0G1H153J                    | C0G                            | 50V              | 15,000              | ± 5%                     | 0.60 ± 0.10       |
| CGJ5C2C0G1H223J                    | C0G                            | 50V              | 22,000              | ± 5%                     | 0.60 ± 0.10       |
| CGJ5F2C0G1H333J                    | C0G                            | 50V              | 33,000              | ± 5%                     | 0.85 +0.02/-0.10  |
| CGJ5H2C0G1H473J                    | C0G                            | 50V              | 47,000              | ± 5%                     | 1.15 ± 0.10       |
| CGJ5L2C0G1H683J                    | C0G                            | 50V              | 68,000              | ± 5%                     | 1.60 +0.20/-0.10  |
| CGJ5L2C0G1H104J                    | C0G                            | 50V              | 100,000             | ± 5%                     | 1.60 +0.20/-0.10  |

### Class 2 (Temperature Stable)

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

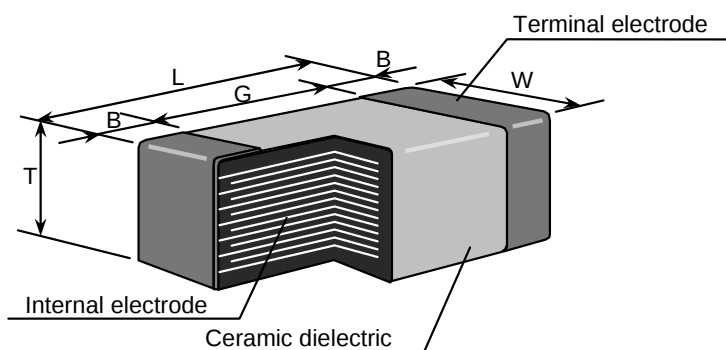
| TDK Part Number<br>(Ordering Code) | Temperature<br>Characteristics | Rated<br>Voltage | Capacitance<br>(pF) | Capacitance<br>Tolerance | Thickness<br>(mm) |
|------------------------------------|--------------------------------|------------------|---------------------|--------------------------|-------------------|
| CGJ5L2X7R1E155K                    | X7R                            | 25V              | 1,500,000           | ± 10%                    | 1.60 ± 0.10       |
| CGJ5L2X7R1E225K                    | X7R                            | 25V              | 2,200,000           | ± 10%                    | 1.60 +0.20/-0.10  |
| CGJ5L2X7R1C155K                    | X7R                            | 16V              | 1,500,000           | ± 10%                    | 1.60 ± 0.10       |
| CGJ5L2X7R1C225K                    | X7R                            | 16V              | 2,200,000           | ± 10%                    | 1.60 +0.20/-0.10  |
| CGJ5L2X7R1C335K                    | X7R                            | 16V              | 3,300,000           | ± 10%                    | 1.60 ± 0.10       |
| CGJ5L2X7R1C475K                    | X7R                            | 16V              | 4,700,000           | ± 10%                    | 1.60 +0.20/-0.10  |
| CGJ5L2X7R1A155K                    | X7R                            | 10V              | 1,500,000           | ± 10%                    | 1.60 ± 0.10       |
| CGJ5L2X7R1A225K                    | X7R                            | 10V              | 2,200,000           | ± 10%                    | 1.60 +0.20/-0.10  |
| CGJ5L2X7R1A335K                    | X7R                            | 10V              | 3,300,000           | ± 10%                    | 1.60 ± 0.10       |
| CGJ5L2X7R1A475K                    | X7R                            | 10V              | 4,700,000           | ± 10%                    | 1.60 +0.20/-0.10  |
| CGJ5L2X7R1A685K                    | X7R                            | 10V              | 6,800,000           | ± 10%                    | 1.60 ± 0.10       |
| CGJ5L2X7R1A106K                    | X7R                            | 10V              | 10,000,000          | ± 10%                    | 1.60 +0.20/-0.10  |
| CGJ5L2X7R0J155K                    | X7R                            | 6.3V             | 1,500,000           | ± 10%                    | 1.60 ± 0.10       |
| CGJ5L2X7R0J225K                    | X7R                            | 6.3V             | 2,200,000           | ± 10%                    | 1.60 +0.20/-0.10  |
| CGJ5L2X7R0J335K                    | X7R                            | 6.3V             | 3,300,000           | ± 10%                    | 1.60 ± 0.10       |
| CGJ5L2X7R0J475K                    | X7R                            | 6.3V             | 4,700,000           | ± 10%                    | 1.60 +0.20/-0.10  |
| CGJ5L2X7R0J685K                    | X7R                            | 6.3V             | 6,800,000           | ± 10%                    | 1.60 ± 0.10       |
| CGJ5L2X7R0J106K                    | X7R                            | 6.3V             | 10,000,000          | ± 10%                    | 1.60 +0.20/-0.10  |



## Additional Information

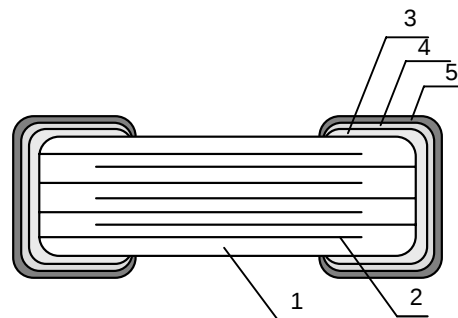
# CGJ Series – Extended Life Capacitors

### • Shape & Dimensions



| Case Code |       |        | Dimensions (mm) |      |      |           |           |
|-----------|-------|--------|-----------------|------|------|-----------|-----------|
| Series    | JIS   | EIA    | L               | W    | T    | B         | G         |
| CGJ2      | C1005 | CC0402 | 1.00            | 0.50 | 0.50 | 0.10      | 0.30 min. |
| CGJ3      | C1608 | CC0603 | 1.60            | 0.80 | 0.80 | 0.20      | 0.50 min. |
| CGJ4      | C2012 | CC0805 | 2.00            | 1.25 | 0.60 | 0.20 min. | 0.50 min. |
|           |       |        |                 |      | 0.85 |           |           |
|           |       |        |                 |      | 1.25 |           |           |
| CGJ5      | C3216 | CC1206 | 3.20            | 1.60 | 0.60 | 0.20 min. | 1.00 min. |
|           |       |        |                 |      | 0.85 |           |           |
|           |       |        |                 |      | 1.15 |           |           |
|           |       |        |                 |      | 1.60 |           |           |

### • Inside Structure & Material System



| No. | NAME               | MATERIAL           |                    |
|-----|--------------------|--------------------|--------------------|
|     |                    | Class 1            | Class 2            |
| (1) | Ceramic Dielectric | CaZrO <sub>3</sub> | BaTiO <sub>3</sub> |
| (2) | Internal Electrode | Nickel (Ni)        |                    |
| (3) | Termination        | Copper (Cu)        |                    |
| (4) |                    | Nickel (Ni)        |                    |
| (5) |                    | Tin (Sn)           |                    |

### • Environmental Information

TDK Corporation established internal product environmental assurance standards that include the six hazardous substances banned by the EU RoHS Directive<sup>1</sup> enforced on July 1, 2006 along with additional substances independently banned by TDK and has successfully completed making general purpose electronic components conform to the RoHS Directive<sup>2</sup>.

1. Abbreviation for Restriction on Hazardous Substances, which refers to the regulation EU Directive 2002/95/EC on hazardous substances by the European Union (EU) effective from July 1, 2006. The Directive bans the use of six specific hazardous substances in electric and electronic devices and products handled within the EU. The six substances are lead, mercury, cadmium, hexavalent chromium, PBB (polybrominated biphenyls), and PBDE (polybrominated diphenyl ethers).
2. This means that, in conformity with the EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

For REACH (SVHC : 15 substances according to ECHA / October 2008) : All TDK MLCC do not contain these 15 substances.

For European Directive 2000/53/CE and 2005/673/CE : Cadmium, Hexavalent Chromium, Mercury, Lead are not contained in all TDK MLCC.

For European Directive 2003/11/CE : Pentabromodiphenyl-ether, Octabromodiphenyl-ether are not contained in all TDK MLCC.



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