TDK

MULTILAYER CERAMIC CHIP CAPACITORS



C Series
High Q Capacitors

Type: C0603 [EIA CC0201]

Issue date: April 2011

TDK MLCC
US Catalog

Version B11

REMINDERS

Please read before using this product

SAFETY REMINDERS

REMINDERS

1. If you intend to use a product listed in this catalog for a purpose that may cause loss of life or other damage, you must contact our company's sales window.
2. We may modify products or discontinue production of a product listed in this catalog without prior notification.
3. 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.
4. 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.
5. Any reproduction or transferring of the contents of this catalog is prohibited without prior permission from our company.
6. We are not responsible for problems that occur related to the intellectual property rights or other rights of our company or a third party when you use a product listed in this catalog. We do not grant license of these rights.
7. This catalog only applies to products purchased through our company or one of our company's official agencies. This catalog does not apply to products that are purchased through other third parties.



C Series

High Q Capacitors

Type: C0603

Available Through Distribution Only*

Features

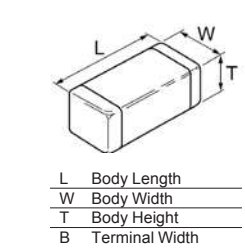
- Higher Q factor than standard capacitors
- High stability with respect to time, temperature, frequency, and voltage
- Excellent attenuation
- High self-resonant frequency
- Lower power dissipation/less energy absorption
- Capacitance range of 0.2pF to 15pF
- Available in standard and tight tolerance
- Please contact TDK for Q values

Applications



- High-frequency applications
- PA modules
- Cellular communication, Bluetooth
- Cable/satellite TV
- GPS/satellite radio
- Filter networks/matching networks
- RF amplifiers/Low noise amplifiers
- VCOs, TCXOs, etc.
- DC blocking circuits

Shape & Dimensions



L	Body Length
W	Body Width
T	Body Height
B	Terminal Width

Dimensions in mm

Part Number Construction

C 0603 C0G 1E 150 J T XXXX

Series Name

Dimensions L x W (mm)

Case Code	Length	Width
C0603	0.60 ± 0.03	0.30 ± 0.03

Temperature Characteristic

Temperature Characteristics	Capacitance Change	Temperature Range
C0G	0±30 ppm/ºC	-55 to +125ºC

Rated Voltage (DC)

Voltage Code	Voltage (DC)
1E	25V

Nominal Capacitance (pF)

The capacitance is expressed in three digit codes and in units of pico Farads (pF). The first and second digits identify the first and second significant figures of the capacitance. The third digit identifies the multiplier. R designates a decimal point.

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

Internal Codes

Packaging Style

Packaging Code	Style
T	Tape & Reel

Capacitance Tolerance

Tolerance Code	Tolerance
W	± 0.05 pF
B	± 0.10 pF
C	± 0.25 pF
D	± 0.50 pF
E	± 0.20 pF
G	± 2%
J	± 5%

* This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.

Capacitance Range Chart

C0603 [EIA CC0201]

Capacitance Range Chart

Temperature Characteristics: C0G (0 ± 30ppm/ºC)

Rated Voltage: 25V(1E)

Capacitance (pF)	Cap Code	Temperature Characteristics	Tolerance						
			W (±0.05)	B (±0.10pF)	C (±0.25pF)	D (±0.50pF)	E (±0.20pF)	G (±2%)	J (±5%)
0.2	0R2	-55 to 125ºC, 0±30 ppm/ºC							
0.3	0R3								
0.4	0R4								
0.5	0R5								
0.6	0R6								
0.7	0R7								
0.8	0R8								
0.9	0R9								
1	010								
1.1	1R1								
1.2	1R2								
1.3	1R3								
1.5	1R5								
1.6	1R6								
1.8	1R8								
2	020								
2.2	2R2								
2.4	2R4								
2.7	2R7								
3	030								
3.3	3R3								
3.6	3R6								
3.9	3R9								
4	040								
4.3	4R3								
4.7	4R7								
5	050								
5.1	5R1								
5.6	5R6								
6	060								
6.2	6R2								
6.8	6R8								
7	070								
7.5	7R5								
8	080								
8.2	8R2								
9	090								
9.1	9R1								
10	100								
11	110								
12	120								
13	130								
15	150								
16	160								
18	180								
20	200								

Standard Thickness

0.30 mm

* This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.



Capacitance Range Table

C0603 [EIA CC0201]

Class 1 (Temperature Compensating)

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

TDK Part Number (Ordering Code)	Temperature Characteristics	Rated Voltage	Capacitance (pF)	Capacitance Tolerance	Thickness (mm)
C0603C0G1E0R2WTQ	C0G	25V	0.2	± 0.05pF	0.30 ± 0.03
C0603C0G1E0R2BTQ	C0G	25V	0.2	± 0.10pF	0.30 ± 0.03
C0603C0G1E0R3WTQ	C0G	25V	0.3	± 0.05pF	0.30 ± 0.03
C0603C0G1E0R3BTQ	C0G	25V	0.3	± 0.10pF	0.30 ± 0.03
C0603C0G1E0R4WTQ	C0G	25V	0.4	± 0.05pF	0.30 ± 0.03
C0603C0G1E0R4BTQ	C0G	25V	0.4	± 0.10pF	0.30 ± 0.03
C0603C0G1E0R5WTQ	C0G	25V	0.5	± 0.05pF	0.30 ± 0.03
C0603C0G1E0R5BTQ	C0G	25V	0.5	± 0.10pF	0.30 ± 0.03
C0603C0G1E0R6WTQ	C0G	25V	0.6	± 0.05pF	0.30 ± 0.03
C0603C0G1E0R6BTQ	C0G	25V	0.6	± 0.10pF	0.30 ± 0.03
C0603C0G1E0R7WTQ	C0G	25V	0.7	± 0.05pF	0.30 ± 0.03
C0603C0G1E0R8WTQ	C0G	25V	0.7	± 0.05pF	0.30 ± 0.03
C0603C0G1E0R7BTQ	C0G	25V	0.7	± 0.10pF	0.30 ± 0.03
C0603C0G1E0R8BTQ	C0G	25V	0.8	± 0.10pF	0.30 ± 0.03
C0603C0G1E0R9WTQ	C0G	25V	0.9	± 0.05pF	0.30 ± 0.03
C0603C0G1E0R9BTQ	C0G	25V	0.9	± 0.10pF	0.30 ± 0.03
C0603C0G1E010BTQ	C0G	25V	1.0	± 0.10pF	0.30 ± 0.03
C0603C0G1E010CTQ	C0G	25V	1.0	± 0.25pF	0.30 ± 0.03
C0603C0G1E1R1BTQ	C0G	25V	1.1	± 0.10pF	0.30 ± 0.03
C0603C0G1E1R1CTQ	C0G	25V	1.1	± 0.25pF	0.30 ± 0.03
C0603C0G1E1R2BTQ	C0G	25V	1.2	± 0.10pF	0.30 ± 0.03
C0603C0G1E1R2CTQ	C0G	25V	1.2	± 0.25pF	0.30 ± 0.03
C0603C0G1E1R3BTQ	C0G	25V	1.3	± 0.10pF	0.30 ± 0.03
C0603C0G1E1R3CTQ	C0G	25V	1.3	± 0.25pF	0.30 ± 0.03
C0603C0G1E1R5BTQ	C0G	25V	1.5	± 0.10pF	0.30 ± 0.03
C0603C0G1E1R5CTQ	C0G	25V	1.5	± 0.25pF	0.30 ± 0.03
C0603C0G1E1R6BTQ	C0G	25V	1.6	± 0.10pF	0.30 ± 0.03
C0603C0G1E1R6CTQ	C0G	25V	1.6	± 0.25pF	0.30 ± 0.03
C0603C0G1E1R8BTQ	C0G	25V	1.8	± 0.10pF	0.30 ± 0.03
C0603C0G1E1R8CTQ	C0G	25V	1.8	± 0.25pF	0.30 ± 0.03
C0603C0G1E020BTQ	C0G	25V	2.0	± 0.10pF	0.30 ± 0.03
C0603C0G1E020CTQ	C0G	25V	2.0	± 0.25pF	0.30 ± 0.03
C0603C0G1E2R2BTX	C0G	25V	2.2	± 0.10pF	0.30 ± 0.03
C0603C0G1E2R2CTX	C0G	25V	2.2	± 0.25pF	0.30 ± 0.03
C0603C0G1E2R4BTX	C0G	25V	2.4	± 0.10pF	0.30 ± 0.03
C0603C0G1E2R4CTX	C0G	25V	2.4	± 0.25pF	0.30 ± 0.03
C0603C0G1E2R7BTX	C0G	25V	2.7	± 0.10pF	0.30 ± 0.03
C0603C0G1E2R7CTX	C0G	25V	2.7	± 0.25pF	0.30 ± 0.03
C0603C0G1E030BTX	C0G	25V	3.0	± 0.10pF	0.30 ± 0.03
C0603C0G1E030CTX	C0G	25V	3.0	± 0.25pF	0.30 ± 0.03
C0603C0G1E3R3BTX	C0G	25V	3.3	± 0.10pF	0.30 ± 0.03
C0603C0G1E3R3CTX	C0G	25V	3.3	± 0.25pF	0.30 ± 0.03
C0603C0G1E3R6BTX	C0G	25V	3.6	± 0.10pF	0.30 ± 0.03
C0603C0G1E3R6CTX	C0G	25V	3.6	± 0.25pF	0.30 ± 0.03

*** This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.**



Capacitance Range Table

C0603 [EIA CC0201]

Class 1 (Temperature Compensating)

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

TDK Part Number (Ordering Code)	Temperature Characteristics	Rated Voltage	Capacitance (pF)	Capacitance Tolerance	Thickness (mm)
C0603C0G1E3R9BTX	C0G	25V	3.9	± 0.10pF	0.30 ± 0.03
C0603C0G1E3R9CTX	C0G	25V	3.9	± 0.25pF	0.30 ± 0.03
C0603C0G1E040BTX	C0G	25V	4.0	± 0.10pF	0.30 ± 0.03
C0603C0G1E040CTX	C0G	25V	4.0	± 0.25pF	0.30 ± 0.03
C0603C0G1E4R3BTX	C0G	25V	4.3	± 0.10pF	0.30 ± 0.03
C0603C0G1E4R3CTX	C0G	25V	4.3	± 0.25pF	0.30 ± 0.03
C0603C0G1E4R7BTX	C0G	25V	4.7	± 0.10pF	0.30 ± 0.03
C0603C0G1E4R7CTX	C0G	25V	4.7	± 0.25pF	0.30 ± 0.03
C0603C0G1E050BTX	C0G	25V	5.0	± 0.10pF	0.30 ± 0.03
C0603C0G1E050CTX	C0G	25V	5.0	± 0.25pF	0.30 ± 0.03
C0603C0G1E5R1BTX	C0G	25V	5.1	± 0.10pF	0.30 ± 0.03
C0603C0G1E5R1CTX	C0G	25V	5.1	± 0.25pF	0.30 ± 0.03
C0603C0G1E5R6BTX	C0G	25V	5.6	± 0.10pF	0.30 ± 0.03
C0603C0G1E5R6CTX	C0G	25V	5.6	± 0.25pF	0.30 ± 0.03
C0603C0G1E060BTX	C0G	25V	6.0	± 0.10pF	0.30 ± 0.03
C0603C0G1E060CTX	C0G	25V	6.0	± 0.25pF	0.30 ± 0.03
C0603C0G1E6R2BTX	C0G	25V	6.2	± 0.10pF	0.30 ± 0.03
C0603C0G1E6R2CTX	C0G	25V	6.2	± 0.25pF	0.30 ± 0.03
C0603C0G1E6R8BTX	C0G	25V	6.8	± 0.10pF	0.30 ± 0.03
C0603C0G1E6R8CTX	C0G	25V	6.8	± 0.25pF	0.30 ± 0.03
C0603C0G1E070BTX	C0G	25V	7.0	± 0.10pF	0.30 ± 0.03
C0603C0G1E070CTX	C0G	25V	7.0	± 0.25pF	0.30 ± 0.03
C0603C0G1E7R5BTX	C0G	25V	7.5	± 0.10pF	0.30 ± 0.03
C0603C0G1E7R5CTX	C0G	25V	7.5	± 0.25pF	0.30 ± 0.03
C0603C0G1E080BTX	C0G	25V	8.0	± 0.10pF	0.30 ± 0.03
C0603C0G1E080CTX	C0G	25V	8.0	± 0.25pF	0.30 ± 0.03
C0603C0G1E8R2BTX	C0G	25V	8.2	± 0.10pF	0.30 ± 0.03
C0603C0G1E8R2CTX	C0G	25V	8.2	± 0.25pF	0.30 ± 0.03
C0603C0G1E090BTX	C0G	25V	9.0	± 0.10pF	0.30 ± 0.03
C0603C0G1E090CTX	C0G	25V	9.0	± 0.25pF	0.30 ± 0.03
C0603C0G1E9R1BTX	C0G	25V	9.1	± 0.10pF	0.30 ± 0.03
C0603C0G1E9R1CTX	C0G	25V	9.1	± 0.25pF	0.30 ± 0.03
C0603C0G1E100ETX	C0G	25V	10	± 0.20pF	0.30 ± 0.03
C0603C0G1E100DTX	C0G	25V	10	± 0.50pF	0.30 ± 0.03
C0603C0G1E110GTX	C0G	25V	11	± 2%	0.30 ± 0.03
C0603C0G1E110JTX	C0G	25V	11	± 5%	0.30 ± 0.03
C0603C0G1E120GTX	C0G	25V	12	± 2%	0.30 ± 0.03
C0603C0G1E120JTX	C0G	25V	12	± 5%	0.30 ± 0.03
C0603C0G1E130GTX	C0G	25V	13	± 2%	0.30 ± 0.03
C0603C0G1E130JTX	C0G	25V	13	± 5%	0.30 ± 0.03
C0603C0G1E150GTX	C0G	25V	15	± 2%	0.30 ± 0.03
C0603C0G1E150JTX	C0G	25V	15	± 5%	0.30 ± 0.03
C0603C0G1E160GTX	C0G	25V	16	± 2%	0.30 ± 0.03
C0603C0G1E160JTX	C0G	25V	16	± 5%	0.30 ± 0.03

*** This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.**

Capacitance Range Table

C0603 [EIA CC0201]

Class 1 (Temperature Compensating)

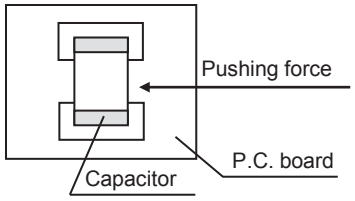
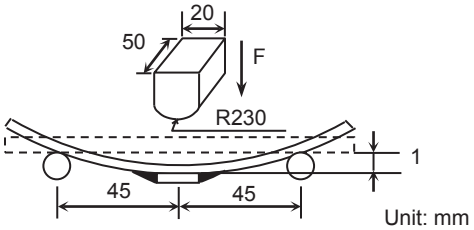
Temperature Characteristics: C0G (-55 to 125ºC, 0±30 ppm/ºC)

TDK Part Number (Ordering Code)	Temperature Characteristics	Rated Voltage	Capacitance (pF)	Capacitance Tolerance	Thickness (mm)
C0603C0G1E180GTX	C0G	25V	18	± 2%	0.30 ± 0.03
C0603C0G1E180JTX	C0G	25V	18	± 5%	0.30 ± 0.03
C0603C0G1E200GTX	C0G	25V	20	± 2%	0.30 ± 0.03
C0603C0G1E200JTX	C0G	25V	20	± 5%	0.30 ± 0.03

*** This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.**

General Specifications

C0603 Series – High Q Capacitors

No.	Item	Performance	Test or Inspection Method
1	**External Appearance**	No defects which may affect performance.	Inspect with magnifying glass (10×).
2	**Insulation Resistance**	10,000MΩ min.	Apply rated voltage for 60s.
3	**Voltage Proof**	Withstand test voltage without insulation breakdown or other damage.	**Class** / **Apply voltage**: Class 1 / 3 × rated voltage Above DC voltage shall be applied for 1 to 5s. Charge / discharge current shall not exceed 50mA.
4	**Capacitance**	Within the specified tolerance.	**Class** / **Measuring Frequency** / **Measuring voltage**: Class 1 / 1MHz±10% / 0.5 - 5 V_{rms}
5	**Q (Class 1)**	**Rated Capacitance** / **Q**: C ≥ 30pF / 1,000 min.; C < 30pF / 400 + 20×C min. C : Rated capacitance (pF)	See No.4 in this table for measuring condition.
6	**Temperature Characteristics of Capacitance (Class 1)**	**T.C.** / **Temperature Coefficient**: C0G / 0 ± 30 ppm/ºC Capacitance drift Within ± 0.2% or ±0.05pF, whichever larger.	Temperature coefficient shall be calculated based on values at 25ºC and 85ºC temperature. Measuring temperature below 20ºC shall be -10ºC and -25ºC.
7	**Robustness of Terminations**	No sign of termination coming off, breakage of ceramic, or other abnormal signs.	Reflow solder the capacitor on P.C. board (shown in Appendix 1) and apply a pushing force of 2N for 10±1s. 
8	**Bending**	No mechanical damage.	Reflow solder the capacitor on P.C. board (shown in Appendix 2) and bend it for 1mm. 

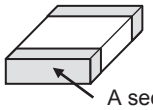
* This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.

General Specifications

C0603 Series – High Q Capacitors

<table>
<tr><th>No.</th><th>Item</th><th>Performance</th><th>Test or Inspection Method</th></tr>
<tr><td>9</td><td>Solderability</td><td>New solder to cover over 75% of termination.

25% may have pinholes or rough spots but not concentrated in one spot.

Ceramic surface of A sections shall not be exposed due to melting or shifting of termination material.

A section</td><td>Completely soak both terminations in solder at 235±5ºC for 2±0.5s.

Solder: H63A (JIS Z 3282)

Flux: Isopropyl alcohol (JIS K 8839)
Rosin (JIS K 5902) 25% solid solution.</td></tr>
<tr><td>10</td><td colspan="2">Resistance to solder heat</td><td rowspan="5">Completely soak both terminations in solder at 260±5ºC for 5±1s.

Preheating condition
Temp.: 150±10ºC
Time : 1 to 2min.

Flux: Isopropyl alcohol (JIS K 8839)
Rosin (JIS K 5902) 25% solid solution.

Solder: H63A (JIS Z 3282)

Leave the capacitor in ambient conditions for 6 to 24h before measurement.</td></tr>
<tr><td></td><td>External appearance</td><td>No cracks are allowed and terminations shall be covered at least 60% with new solder.</td></tr>
<tr><td></td><td>Capacitance</td><td><table><tr><th colspan="2">Characteristics</th><th>Change from the value before test</th></tr><tr><td>Class 1</td><td>C0G</td><td>Capacitance drift within ±2.5% or ±0.25pF, whichever larger.</td></tr></table></td></tr>
<tr><td></td><td>Q (Class 1)</td><td><table><tr><th>Rated Capacitance</th><th>Q</th></tr><tr><td>C ≥ 30pF</td><td>1,000 min.</td></tr><tr><td>C < 30pF</td><td>400 + 20×C min.</td></tr></table>C : Rated capacitance (pF)</td></tr>
<tr><td></td><td>Insulation Resistance</td><td>Meet the initial spec.</td></tr>
<tr><td></td><td>Voltage Proof</td><td>No insulation breakdown or other damage.</td></tr>
<tr><td>11</td><td colspan="2">Vibration</td><td rowspan="4">Reflow solder the capacitor on P.C. board (shown in Appendix 1) before testing.

Vibrate the capacitor with amplitude of 1.5mm P-P sweeping the frequencies from 10Hz to 55Hz and back to 10Hz after 1min.

Repeat this for 2h each in 3 perpendicular directions.</td></tr>
<tr><td></td><td>External appearance</td><td>No mechanical damage.</td></tr>
<tr><td></td><td>Capacitance</td><td><table><tr><th colspan="2">Characteristics</th><th>Change from the value before test</th></tr><tr><td>Class 1</td><td>C0G</td><td>Capacitance drift within ±2.5% or ±0.25pF, whichever larger.</td></tr></table></td></tr>
<tr><td></td><td>Q (Class 1)</td><td><table><tr><th>Rated Capacitance</th><th>Q</th></tr><tr><td>C ≥ 30pF</td><td>1,000 min.</td></tr><tr><td>C < 30pF</td><td>400+20×C min.</td></tr></table>C : Rated capacitance (pF)</td></tr>
</table>

* This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.

General Specifications

C0603 Series – High Q Capacitors

<table>
<tr><th>No.</th><th>Item</th><th>Performance</th><th>Test or Inspection Method</th></tr>
<tr><td>12</td><td>Temperature cycle</td><td></td><td rowspan="5">Reflow solder the capacitors on a P.C. board (shown in Appendix 1) before testing.

Expose the capacitor in the conditions in step 1 through step 4, and repeat 5 times consecutively.

Leave the capacitor in ambient conditions for 6 to 24h before measurement.

<table><tr><th>Step</th><th>Temperature (ºC)</th><th>Time (min.)</th></tr><tr><td>1</td><td>Min. operating temp. ±3</td><td>30 ± 3</td></tr><tr><td>2</td><td>Reference Temp.</td><td>2 – 5</td></tr><tr><td>3</td><td>Max. operating temp. ± 2</td><td>30 ± 2</td></tr><tr><td>4</td><td>Reference Temp.</td><td>2 - 5</td></tr></table></td></tr>
<tr><td></td><td>External appearance</td><td>No mechanical damage.</td></tr>
<tr><td></td><td>Capacitance</td><td><table><tr><th colspan="2">Characteristics</th><th>Change from the value before test</th></tr><tr><td>Class 1</td><td>C0G</td><td>Capacitance drift within ±2.5% or ±0.25pF, whichever larger.</td></tr></table></td></tr>
<tr><td></td><td>Q (Class 1)</td><td><table><tr><th>Rated Capacitance</th><th>Q</th></tr><tr><td>C ≥ 30pF</td><td>1,000 min.</td></tr><tr><td>C < 30pF</td><td>400 + 20×C min.</td></tr></table>C : Rated capacitance (pF)</td></tr>
<tr><td></td><td>Insulation Resistance</td><td>Meet the initial spec.</td></tr>
<tr><td></td><td>Voltage Proof</td><td>No insulation breakdown or other damage.</td></tr>
<tr><td>13</td><td>Moisture Resistance (Steady State)</td><td></td><td rowspan="5">Reflow solder the capacitor on P.C. board (shown in Appendix 1) before testing.

Leave at temperature 40±2ºC, 90 to 95%RH for 500 +24,0h.

Leave the capacitor in ambient condition for 6 to 24h before measurement.</td></tr>
<tr><td></td><td>External appearance</td><td>No mechanical damage.</td></tr>
<tr><td></td><td>Capacitance</td><td><table><tr><th colspan="2">Characteristics</th><th>Change from the value before test</th></tr><tr><td>Class 1</td><td>C0G</td><td>Capacitance drift within ±5% or ±0.5pF, whichever larger.</td></tr></table></td></tr>
<tr><td></td><td>Q (Class 1)</td><td><table><tr><th>Rated Capacitance</th><th>Q</th></tr><tr><td>C ≥ 30pF</td><td>350 min.</td></tr><tr><td>10pF ≤ C < 30pF</td><td>275 + 5/2×C min.</td></tr><tr><td>C < 10pF</td><td>200 + 10×C min.</td></tr></table>C : Rated capacitance (pF)</td></tr>
<tr><td></td><td>Insulation Resistance</td><td>1,000MΩ min.</td></tr>
</table>

* This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.

General Specifications

C0603 Series – High Q Capacitors

<table>
<tr><th>No.</th><th>Item</th><th>Performance</th><th>Test or Inspection Method</th></tr>
<tr><td>14</td><td>Moisture Resistance</td><td></td><td rowspan="4">Reflow solder the capacitors on P.C. board (shown in Appendix 1) before testing.
Apply the rated voltage at temperature 40±2ºC and 90 to 95%RH for 500 +24,0h.
Charge/discharge current shall not exceed 50mA.
Leave the capacitor in ambient conditions for 6 to 24h before measurement.
Use this measurement for initial value.</td></tr>
<tr><td></td><td>External appearance</td><td>No mechanical damage.</td></tr>
<tr><td></td><td>Capacitance</td><td><table><tr><th colspan="2">Characteristics</th><th>Change from the value before test</th></tr><tr><td>Class 1</td><td>C0G</td><td>Capacitance drift within ±7.5% or ±0.75pF, whichever larger.</td></tr></table></td></tr>
<tr><td></td><td>Q (Class 1)</td><td><table><tr><th>Rated Capacitance</th><th>Q</th></tr><tr><td>C ≥ 30pF</td><td>200 min.</td></tr><tr><td>C < 30pF</td><td>100 + 10/3×C min.</td></tr></table>C : Rated capacitance (pF)</td></tr>
<tr><td></td><td>Insulation Resistance</td><td>500MΩ min.</td><td></td></tr>
<tr><td>15</td><td>Life</td><td></td><td rowspan="4">Reflow solder the capacitor on P.C. board (shown in Appendix 1) before testing.
Apply 2x rated voltage at 125±2ºC for 1,000 +48, 0h.
Charge/discharge current shall not exceed 50mA.
Leave the capacitors in ambient condition for 6 to 24h before measurement.
Use this measurement for initial value.</td></tr>
<tr><td></td><td>External appearance</td><td>No mechanical damage.</td></tr>
<tr><td></td><td>Capacitance</td><td><table><tr><th colspan="2">Characteristics</th><th>Change from the value before test</th></tr><tr><td>Class 1</td><td>C0G</td><td>Capacitance drift within ±3% or ±0.3pF, whichever larger.</td></tr></table></td></tr>
<tr><td></td><td>Q (Class 1)</td><td><table><tr><th>Rated Capacitance</th><th>Q</th></tr><tr><td>C ≥ 30pF</td><td>350 min.</td></tr><tr><td>10pF ≤ C < 30pF</td><td>275 + 5/2×C min.</td></tr><tr><td>C < 10pF</td><td>200 + 10×C min.</td></tr></table>C : Rated capacitance (pF)</td></tr>
<tr><td></td><td>Insulation Resistance</td><td>1,000MΩ min.</td><td></td></tr>
</table>

* This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.

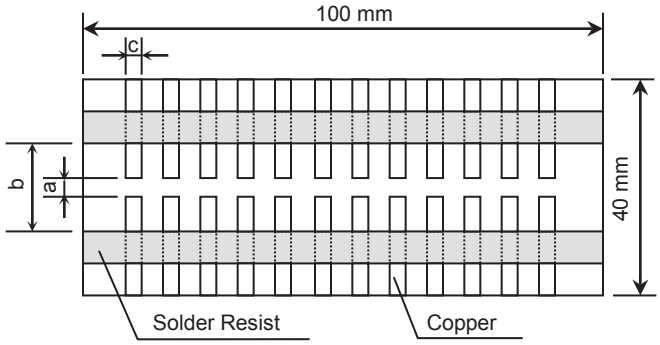
General Specifications

C0603 Series – High Q Capacitors

Appendix - 1a

P.C. Board for reliability test

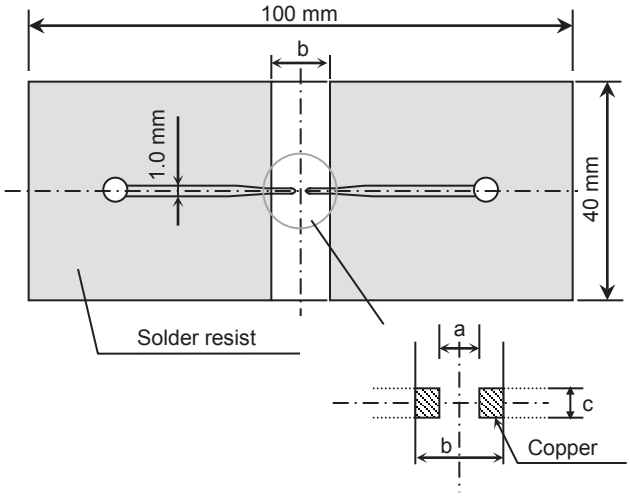
Applied for C0603, C1005, C1608, C2012, C3216



Appendix - 2a

P.C. Board for bending test

Applied for C0603, C1005



Material : Glass Epoxy (As per JIS C6484 GE4)

P.C. Board thickness : Appendix - 2 0.8mm

Appendix - 1 1.6mm

Copper (thickness 0.035mm)

Solder resist

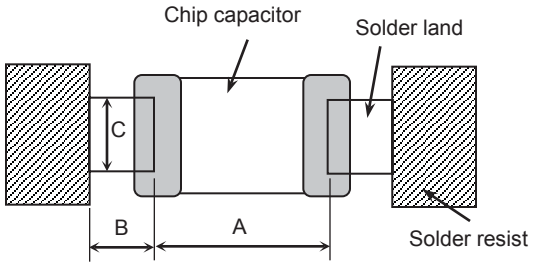
Case Code		Dimensions (mm)		
JIS	EIA	a	b	c
C0603	CC0201	0.3	0.8	0.3

* This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.

Soldering Information

C0603 Series – High Q Capacitors

• Recommended Soldering Land Pattern

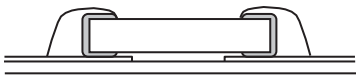


Reflow Soldering Unit: mm

Symbol \ Type	C0603 [CC0201]
A	0.25 ~ 0.35
B	0.2 ~ 0.3
C	0.25 ~ 0.35

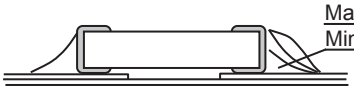
• Recommended Solder Amount

Excessive solder

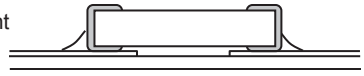


Higher tensile force on the chip capacitor may cause cracking.

Adequate solder

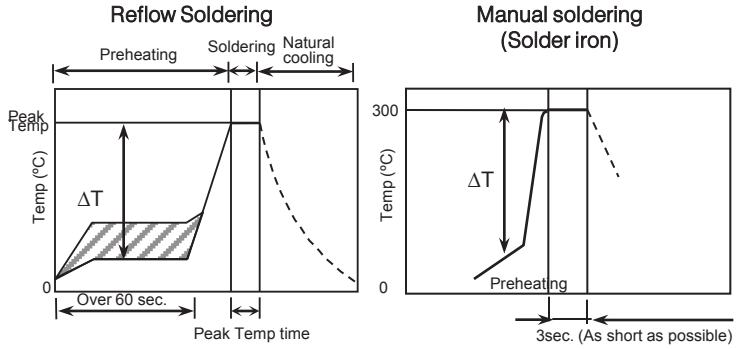


Insufficient solder



Small solder fillet may cause contact failure or failure to hold the chip capacitor to the P.C. board.

• Recommended Soldering Profile



Recommended soldering duration

Solder \ Temp./Dura.	Reflow Soldering	
	Peak temp (°C)	Duration (sec.)
Sn-Pb Solder	230 max.	20 max.
Lead-Free Solder	260 max.	10 max.

Recommended solder compositions
Sn-37Pb (Sn-Pb solder)
Sn-3.0Ag-0.5Cu (Lead Free Solder)

Preheating Condition

Soldering	Temp. (ºC)
Reflow soldering	ΔT ≤ 150
Manual soldering	ΔT ≤ 150

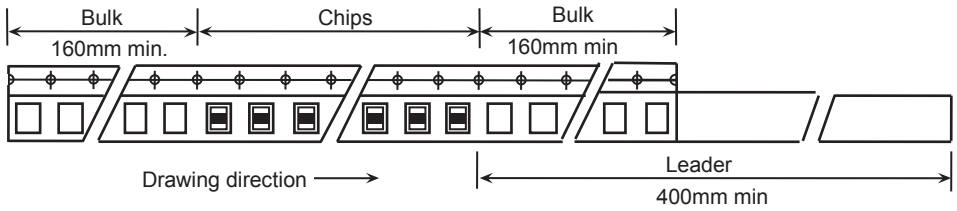
* This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.



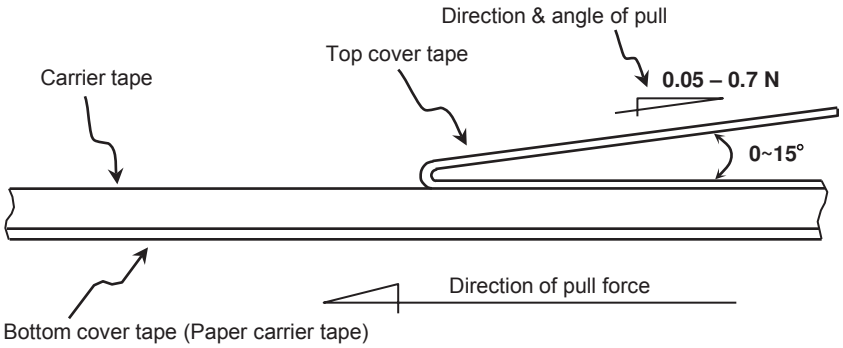
Packaging Information

C0603 Series – High Q Capacitors

- Carrier Tape Configuration

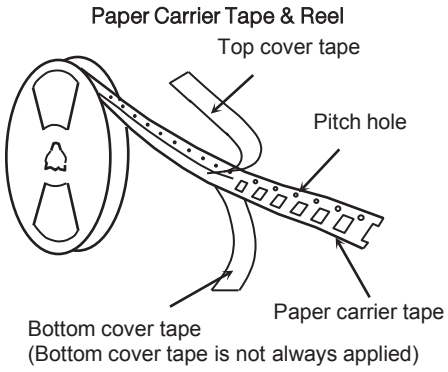


- Peel Back Force (Top Tape)



• Carrier tape shall be flexible enough to be wound around a minimum radius of 30mm with components in tape.
• The missing of components shall be less than 0.1%
• Components shall not stick to the cover tape.
• The cover tape shall not protrude beyond the edges of the carrier tape and shall not cover the sprocket holes.

- Chip Quantity Per Reel and Structure of Reel



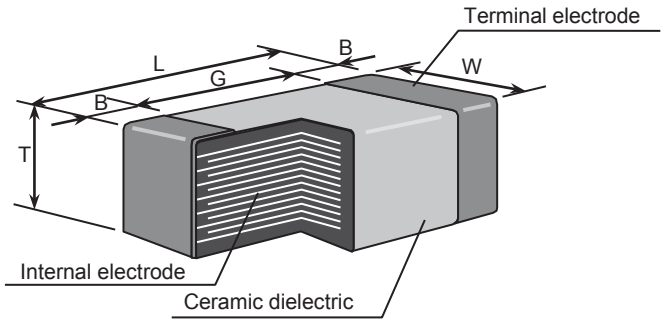
Case Code		Chip Thickness (mm)	Taping Material	Chip quantity (pcs.)
JIS	EIA			φ178mm (7") reel
C0603	CC0201	0.30	Paper	15,000

* This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.

Additional Information

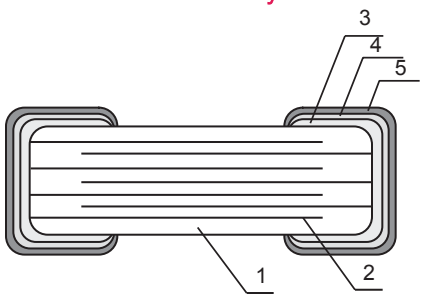
C0603 Series – High Q Capacitors

• Shape & Dimensions



Case Code		Dimensions (mm)				
JIS	EIA	L	W	T	B	G
C0603	CC0201	0.60	0.30	0.30	0.15	0.20 min.

• Inside Structure & Material System



No.	NAME	MATERIAL
		Class 1
(1)	Ceramic Dielectric	$CaZrO_3$
(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[1] 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[2].

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.

*** This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.**