



MULTILAYER CERAMIC CHIP CAPACITORS



C Series High Q Capacitors

Type: C0603 [EIA CC0201]

Issue date: January 2011



**TDK MLCC
US Catalog**

Version A11

REMINDERS

Please read before using this product

SAFETY REMINDERS



REMINDERS

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C Series High Q Capacitors

Type: C0603

Available Through Distribution Only*

Features



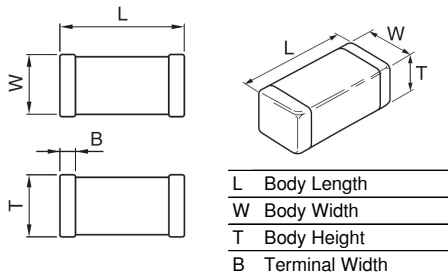
- Higher Q factor than standard capacitors
- High stability with respect to time, temperature, frequency, and voltage
- Excellent attenuation
- High self-resonant frequency
- Lower power dissipation/less energy absorption
- Capacitance range of 0.2pF to 15pF
- Available in standard and tight tolerance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



Dimensions in mm



Part Number Construction

Series Name	C	0603	C0G	1E	150	J	T	XXXX	Internal Codes
Dimensions L x W (mm)	Case Code	Length	Width						Packaging Style
	C0603	0.60±0.03	0.30±0.03						T Tape and Reel
Temperature Characteristic	Temperature Characteristics	Capacitance Change	Temperature Range						Capacitance Tolerance
	C0G	0±30 ppm/°C	-55 to +125°C						B ± 0.10pF
Rated Voltage (DC)	Voltage Code	Voltage(DC)							C ± 0.25pF
	1E	25V							D ± 0.50pF
Nominal Capacitance (pF)									E ± 0.20pF
									G ± 2%
									J ± 5%

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)

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Capacitance Range Chart

C0603 [EIA CC0201]

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Capacitance Range Chart

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

Rated Voltage: 25V (1E)

Capacitance (pF)	Cap Code	Voltage	Tolerance						
			B ($\pm 0.10\text{pF}$)	C ($\pm 0.25\text{pF}$)	D ($\pm 0.50\text{pF}$)	E ($\pm 0.20\text{pF}$)	G ($\pm 2\%$)	J ($\pm 5\%$)	
0.2	0R2	25V (1E)	█						
0.3	0R3								
0.4	0R4								
0.5	0R5								
0.6	0R6								
0.7	0R7								
0.8	0R8								
0.9	0R9								
1.0	010				█				
1.2	1R2								
1.5	1R5								
1.8	1R8								
2.0	020								
2.2	2R2								
2.7	2R7								
3.0	030								
3.3	3R3								
3.9	3R9								
4.0	040								
4.7	4R7								
5.0	050								
5.6	5R6								
6.0	060								
6.8	6R8								
7.0	070								
8.0	080								
8.2	8R2								
9.0	090								
10.0	100				█	█			
12.0	120						█	█	
15.0	150								

Standard Thickness

█ 0.30 ± 0.03 mm

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Capacitance Range Table

C0603 [EIA CC0201]

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Class 1 (Temperature Compensating)

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

TDK Part Number (Ordering Code)	Temperature Characteristics	Rated Voltage	Capacitance (pF)	Capacitance Tolerance	Thickness (mm)
C0603C0G1E0R2BTQ	C0G	25V	0.2	± 0.10pF	0.30 ± 0.03
C0603C0G1E0R3BTQ	C0G	25V	0.3	± 0.10pF	0.30 ± 0.03
C0603C0G1E0R4BTQ	C0G	25V	0.4	± 0.10pF	0.30 ± 0.03
C0603C0G1E0R5BTQ	C0G	25V	0.5	± 0.10pF	0.30 ± 0.03
C0603C0G1E0R6BTQ	C0G	25V	0.6	± 0.10pF	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
C0603C0G1E0R9BTQ	C0G	25V	0.9	± 0.10pF	0.30 ± 0.03
C0603C0G1E010BTQ	C0G	25V	1	± 0.10pF	0.30 ± 0.03
C0603C0G1E010CTQ	C0G	25V	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
C0603C0G1E1R5BTQ	C0G	25V	1.5	± 0.10pF	0.30 ± 0.03
C0603C0G1E1R5CTQ	C0G	25V	1.5	± 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	± 0.10pF	0.30 ± 0.03
C0603C0G1E020CTQ	C0G	25V	2	± 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
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	± 0.10pF	0.30 ± 0.03
C0603C0G1E030CTX	C0G	25V	3	± 0.25pF	0.30 ± 0.03
C0603C0G1E3R3BTX	C0G	25V	3	± 0.10pF	0.30 ± 0.03
C0603C0G1E3R3CTX	C0G	25V	3.3	± 0.25pF	0.30 ± 0.03
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	± 0.10pF	0.30 ± 0.03
C0603C0G1E040CTX	C0G	25V	4	± 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	± 0.10pF	0.30 ± 0.03
C0603C0G1E050CTX	C0G	25V	5	± 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	± 0.10pF	0.30 ± 0.03
C0603C0G1E060CTX	C0G	25V	6	± 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	± 0.10pF	0.30 ± 0.03
C0603C0G1E070CTX	C0G	25V	7	± 0.25pF	0.30 ± 0.03
C0603C0G1E080BTX	C0G	25V	8	± 0.10pF	0.30 ± 0.03
C0603C0G1E080CTX	C0G	25V	8	± 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	± 0.10pF	0.30 ± 0.03
C0603C0G1E090CTX	C0G	25V	9	± 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
C0603C0G1E120GTX	C0G	25V	12	± 2%	0.30 ± 0.03
C0603C0G1E120JTX	C0G	25V	12	± 5%	0.30 ± 0.03
C0603C0G1E150GTX	C0G	25V	15	± 2%	0.30 ± 0.03
C0603C0G1E150JTX	C0G	25V	15	± 5%	0.30 ± 0.03

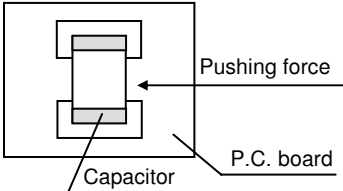
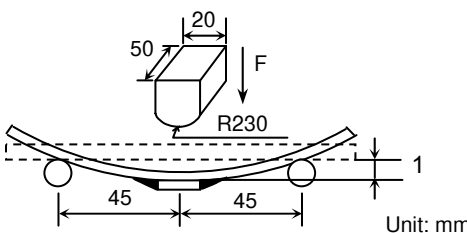
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General Specifications

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.	<table border="1"> <thead> <tr> <th>Class</th> <th>Apply voltage</th> </tr> </thead> <tbody> <tr> <td>Class 1</td> <td>3 × rated voltage</td> </tr> </tbody> </table> <p>Above DC voltage shall be applied for 1 to 5s. Charge / discharge current shall not exceed 50mA.</p>	Class	Apply voltage	Class 1	3 × rated voltage		
Class	Apply voltage								
Class 1	3 × rated voltage								
4	Capacitance	Within the specified tolerance.	<table border="1"> <thead> <tr> <th>Class</th> <th>Measuring Frequency</th> <th>Measuring voltage</th> </tr> </thead> <tbody> <tr> <td>Class 1</td> <td>1MHz±10%</td> <td>0.5 - 5 V_{rms}</td> </tr> </tbody> </table>	Class	Measuring Frequency	Measuring voltage	Class 1	1MHz±10%	0.5 - 5 V _{rms}
Class	Measuring Frequency	Measuring voltage							
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5	Q (Class 1)	<table border="1"> <thead> <tr> <th>Rated Capacitance</th> <th>Q</th> </tr> </thead> <tbody> <tr> <td>C ≥ 30pF</td> <td>1,000 min.</td> </tr> <tr> <td>C < 30pF</td> <td>400 + 20 × C min.</td> </tr> </tbody> </table> <p>C : Rated capacitance (pF)</p>	Rated Capacitance	Q	C ≥ 30pF	1,000 min.	C < 30pF	400 + 20 × C min.	See No.4 in this table for measuring condition.
Rated Capacitance	Q								
C ≥ 30pF	1,000 min.								
C < 30pF	400 + 20 × C min.								
6	Temperature Characteristics of Capacitance (Class 1)	<table border="1"> <thead> <tr> <th>T.C.</th> <th>Temperature Coefficient</th> </tr> </thead> <tbody> <tr> <td>C0G</td> <td>0 ± 30 ppm/°C</td> </tr> </tbody> </table> <p>Capacitance drift Within ± 0.2% or ±0.05pF, whichever larger.</p>	T.C.	Temperature Coefficient	C0G	0 ± 30 ppm/°C	<p>Temperature coefficient shall be calculated based on values at 25°C and 85°C temperature.</p> <p>Measuring temperature below 20°C shall be -10°C and -25°C.</p>		
T.C.	Temperature Coefficient								
C0G	0 ± 30 ppm/°C								
7	Robustness of Terminations	No sign of termination coming off, breakage of ceramic, or other abnormal signs.	<p>Reflow solder the capacitor on P.C. board (shown in Appendix 1) and apply a pushing force of 2N for 10 ± 1s.</p> 						
8	Bending	No mechanical damage.	<p>Reflow solder the capacitor on P.C. board (shown in Appendix 2) and bend it for 1mm.</p>  <p style="text-align: right;">Unit: mm</p>						

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No.	Item	Performance	Test or Inspection Method						
9	Solderability	<p>New solder to cover over 75% of termination.</p> <p>25% may have pinholes or rough spots but not concentrated in one spot.</p> <p>Ceramic surface of A sections shall not be exposed due to melting or shifting of termination material.</p>	<p>Completely soak both terminations in solder at $235 \pm 5^\circ\text{C}$ for $2 \pm 0.5\text{s}$.</p> <p>Solder: H63A (JIS Z 3282)</p> <p>Flux: Isopropyl alcohol (JIS K 8839) Rosin (JIS K 5902) 25% solid solution.</p>						
		<p>A section</p>							
10	Resistance to solder heat		<p>Completely soak both terminations in solder at $260 \pm 5^\circ\text{C}$ for $5 \pm 1\text{s}$.</p> <p>Preheating condition Temp.: $150 \pm 10^\circ\text{C}$ Time : 1 to 2min.</p> <p>Flux: Isopropyl alcohol (JIS K 8839) Rosin (JIS K 5902) 25% solid solution.</p> <p>Solder: H63A (JIS Z 3282)</p> <p>Leave the capacitor in ambient conditions for 6 to 24h before measurement.</p>						
	External appearance	No cracks are allowed and terminations shall be covered at least 60% with new solder.							
	Capacitance	<table border="1"> <thead> <tr> <th colspan="2">Characteristics</th> <th>Change from the value before test</th> </tr> </thead> <tbody> <tr> <td>Class 1</td> <td>C0G</td> <td>Capacitance drift within $\pm 2.5\%$ or $\pm 0.25\text{pF}$, whichever larger.</td> </tr> </tbody> </table>	Characteristics		Change from the value before test	Class 1	C0G	Capacitance drift within $\pm 2.5\%$ or $\pm 0.25\text{pF}$, whichever larger.	
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Rated Capacitance	Q								
$C \geq 30\text{pF}$	1,000 min.								
$C < 30\text{pF}$	$400 + 20 \times C$ min.								
	Insulation Resistance	Meet the initial spec.							
	Voltage Proof	No insulation breakdown or other damage.							
11	Vibration		<p>Reflow solder the capacitor on P.C. board (shown in Appendix 1) before testing.</p> <p>Vibrate the capacitor with amplitude of 1.5mm P-P sweeping the frequencies from 10Hz to 55Hz and back to 10Hz after 1min.</p> <p>Repeat this for 2h each in 3 perpendicular directions.</p>						
	External appearance	No mechanical damage.							
	Capacitance	<table border="1"> <thead> <tr> <th colspan="2">Characteristics</th> <th>Change from the value before test</th> </tr> </thead> <tbody> <tr> <td>Class 1</td> <td>C0G</td> <td>Capacitance drift within $\pm 2.5\%$ or $\pm 0.25\text{pF}$, whichever larger.</td> </tr> </tbody> </table>	Characteristics		Change from the value before test	Class 1	C0G	Capacitance drift within $\pm 2.5\%$ or $\pm 0.25\text{pF}$, whichever larger.	
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$C \geq 30\text{pF}$	1,000 min.								
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No.	Item	Performance	Test or Inspection Method							
12	Temperature cycle		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.							
	External appearance	No mechanical damage.								
	Capacitance	<table border="1"> <thead> <tr> <th colspan="2">Characteristics</th> <th>Change from the value before test</th> </tr> </thead> <tbody> <tr> <td>Class 1</td> <td>C0G</td> <td>Capacitance drift within $\pm 2.5\%$ or $\pm 0.25\text{pF}$, whichever larger.</td> </tr> </tbody> </table>		Characteristics		Change from the value before test	Class 1	C0G	Capacitance drift within $\pm 2.5\%$ or $\pm 0.25\text{pF}$, whichever larger.	
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Rated Capacitance		Q								
$C \geq 30\text{pF}$		1,000 min.								
$C < 30\text{pF}$	$400 + 20 \times C$ min.									
C : Rated capacitance (pF)										
Insulation Resistance	Meet the initial spec.									
Voltage Proof	No insulation breakdown or other damage.									
13	Moisture Resistance (Steady State)		Reflow solder the capacitor on P.C. board (shown in Appendix 1) before testing. Leave at temperature $40 \pm 2^\circ\text{C}$, 90 to 95%RH for 500 +24,0h. Leave the capacitor in ambient condition for 6 to 24h before measurement.							
	External appearance	No mechanical damage.								
	Capacitance	<table border="1"> <thead> <tr> <th colspan="2">Characteristics</th> <th>Change from the value before test</th> </tr> </thead> <tbody> <tr> <td>Class 1</td> <td>C0G</td> <td>Capacitance drift within $\pm 5\%$ or $\pm 0.5\text{pF}$, whichever larger.</td> </tr> </tbody> </table>		Characteristics		Change from the value before test	Class 1	C0G	Capacitance drift within $\pm 5\%$ or $\pm 0.5\text{pF}$, whichever larger.	
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Rated Capacitance		Q								
$C \geq 30\text{pF}$		350 min.								
$10\text{pF} \leq C < 30\text{pF}$	$275 + 5/2 \times C$ min.									
$C < 10\text{pF}$	$200 + 10 \times C$ min.									
C : Rated capacitance (pF)										
Insulation Resistance	1,000M Ω min.									

Step	Temperature ($^\circ\text{C}$)	Time (min.)
1	Min. operating temp. ± 3	30 ± 3
2	Reference Temp.	2 - 5
3	Max. operating temp. ± 2	30 ± 2
4	Reference Temp.	2 - 5

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No.	Item	Performance	Test or Inspection Method							
14	Moisture Resistance									
	External appearance	No mechanical damage.	Reflow solder the capacitors on P.C. board (shown in Appendix 1) before testing.							
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		Characteristics		Change from the value before test						
		Class 1	C0G	Capacitance drift within $\pm 7.5\%$ or $\pm 0.75\text{pF}$, whichever larger.						
<table border="1"> <thead> <tr> <th>Rated Capacitance</th> <th>Q</th> </tr> </thead> <tbody> <tr> <td>$C \geq 30\text{pF}$</td> <td>200 min.</td> </tr> <tr> <td>$C < 30\text{pF}$</td> <td>$100 + 10/3 \times C$ min.</td> </tr> </tbody> </table>		Rated Capacitance	Q	$C \geq 30\text{pF}$	200 min.	$C < 30\text{pF}$	$100 + 10/3 \times C$ min.	Charge/discharge current shall not exceed 50mA.		
Rated Capacitance	Q									
$C \geq 30\text{pF}$	200 min.									
$C < 30\text{pF}$	$100 + 10/3 \times C$ min.									
C : Rated capacitance (pF)		Leave the capacitor in ambient conditions for 6 to 24h before measurement.								
Q (Class 1)		Use this measurement for initial value.								
	Insulation Resistance	500M Ω min.								
15	Life									
	External appearance	No mechanical damage.	Reflow solder the capacitor on P.C. board (shown in Appendix 1) before testing.							
	Capacitance	<table border="1"> <thead> <tr> <th colspan="2">Characteristics</th> <th>Change from the value before test</th> </tr> </thead> <tbody> <tr> <td>Class 1</td> <td>C0G</td> <td>Capacitance drift within $\pm 3\%$ or $\pm 0.3\text{pF}$, whichever larger.</td> </tr> </tbody> </table>		Characteristics		Change from the value before test	Class 1	C0G	Capacitance drift within $\pm 3\%$ or $\pm 0.3\text{pF}$, whichever larger.	Apply 2x rated voltage at $125 \pm 2^\circ\text{C}$ for 1,000 +48, 0h.
		Characteristics		Change from the value before test						
		Class 1	C0G	Capacitance drift within $\pm 3\%$ or $\pm 0.3\text{pF}$, whichever larger.						
<table border="1"> <thead> <tr> <th>Rated Capacitance</th> <th>Q</th> </tr> </thead> <tbody> <tr> <td>$C \geq 30\text{pF}$</td> <td>350 min.</td> </tr> <tr> <td>$10\text{pF} \leq C < 30\text{pF}$</td> <td>$275 + 5/2 \times C$ min.</td> </tr> <tr> <td>$C < 10\text{pF}$</td> <td>$200 + 10 \times C$ min.</td> </tr> </tbody> </table>		Rated Capacitance	Q	$C \geq 30\text{pF}$	350 min.	$10\text{pF} \leq C < 30\text{pF}$	$275 + 5/2 \times C$ min.	$C < 10\text{pF}$	$200 + 10 \times C$ min.	Charge/discharge current shall not exceed 50mA.
Rated Capacitance	Q									
$C \geq 30\text{pF}$	350 min.									
$10\text{pF} \leq C < 30\text{pF}$	$275 + 5/2 \times C$ min.									
$C < 10\text{pF}$	$200 + 10 \times C$ min.									
C : Rated capacitance (pF)		Leave the capacitors in ambient condition for 6 to 24h before measurement.								
Q (Class 1)		Use this measurement for initial value.								
	Insulation Resistance	1,000M Ω min.								

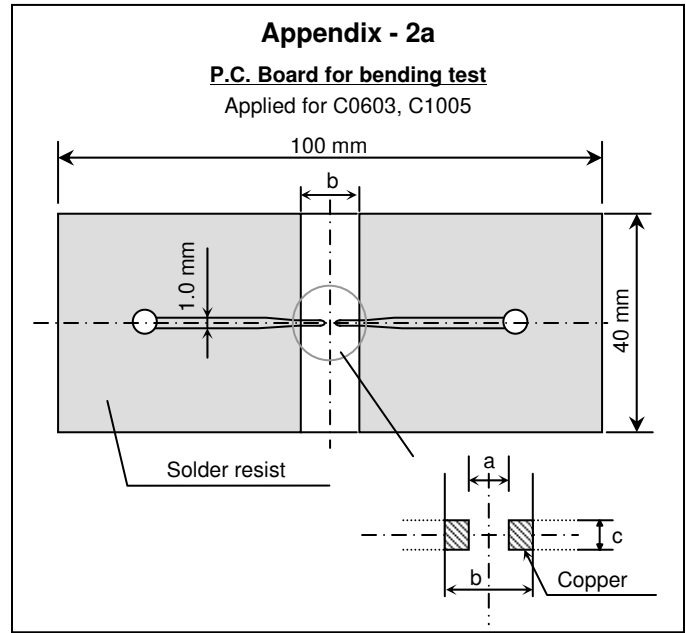
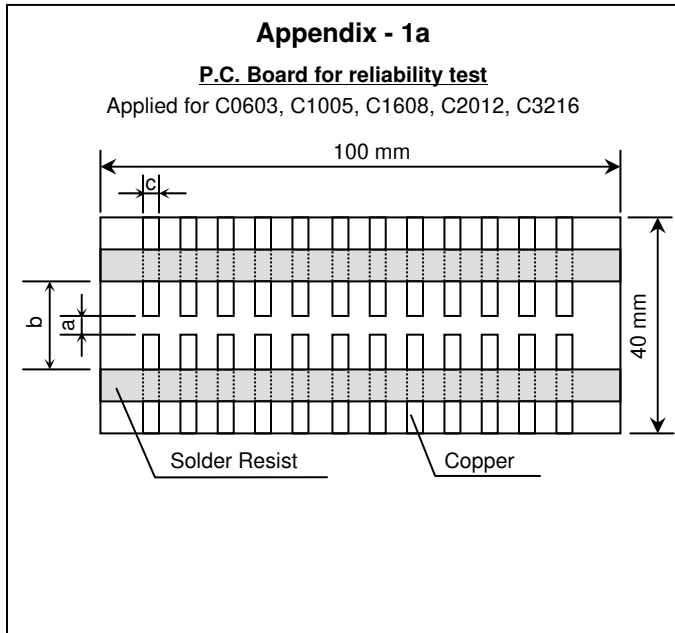
* This series is available through the distribution channel only. Please see www.tdk.com/distributor.php for a list of authorized distributors.

• All specifications are subject to change without notice. Please read the precautions before using the product.



General Specifications

C0603 Series – High Q Capacitors



Material : Glass Epoxy (As per JIS C6484 GE4)

P.C. Board thickness : Appendix - 2 0.8mm
Appendix - 1 1.6mm

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

- Copper (thickness 0.035mm)
- Solder resist

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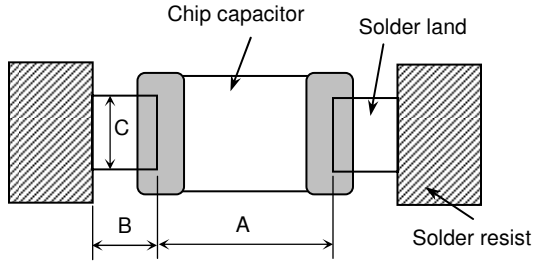
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Soldering Information

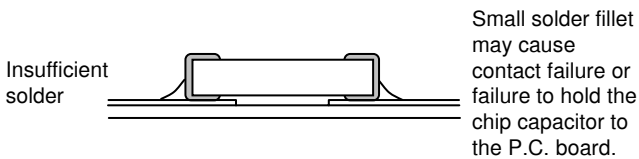
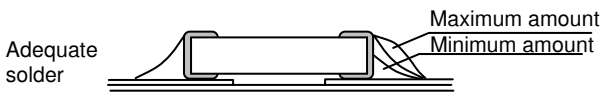
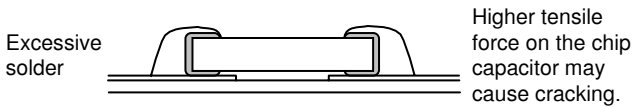
C0603 Series – High Q Capacitors

Recommended Soldering Land Pattern

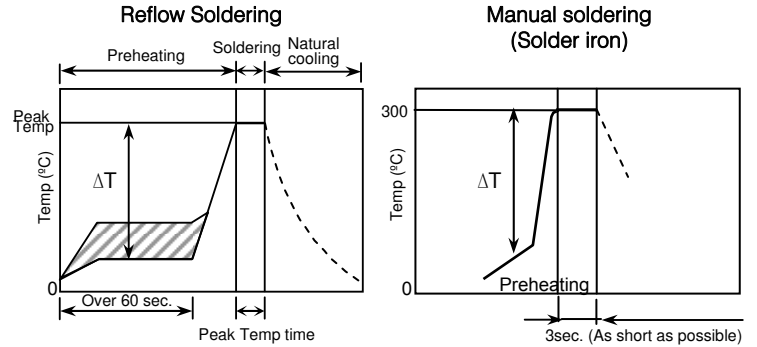


Reflow Soldering		Unit: mm
Type	C0603	
Symbol	[CC0201]	
A	0.25 ~ 0.35	
B	0.2 ~ 0.3	
C	0.25 ~ 0.35	

Recommended Solder Amount



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. (°C)
Reflow soldering	$\Delta T \leq 150$
Manual soldering	$\Delta T \leq 150$

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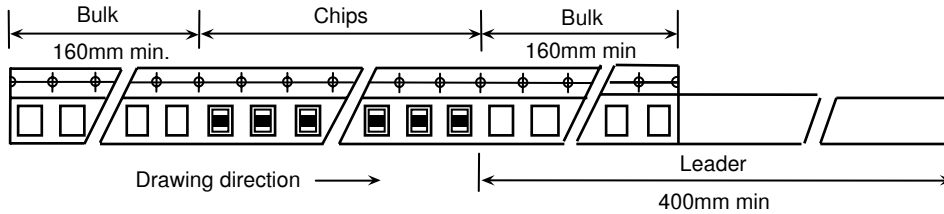
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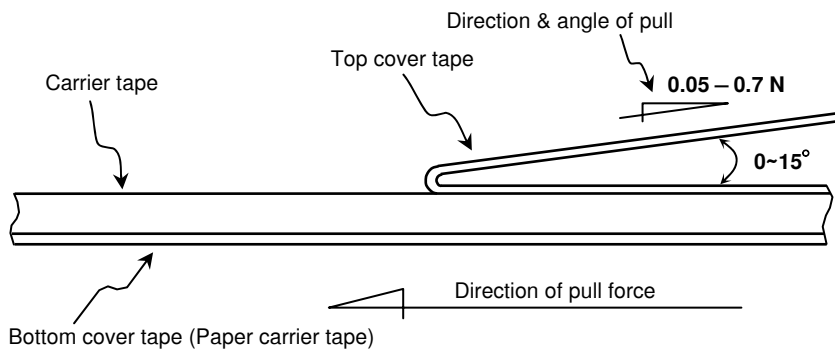
Packaging Information

C0603 Series – High Q Capacitors

Carrier Tape Configuration

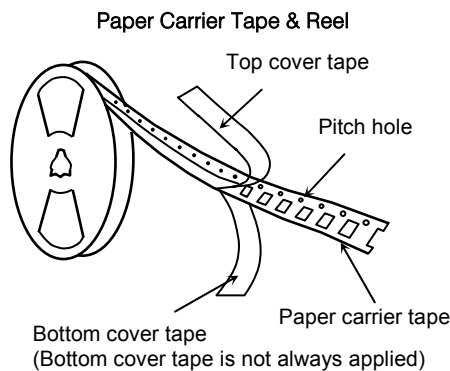


Peel Back Force (Top Tape)



- 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

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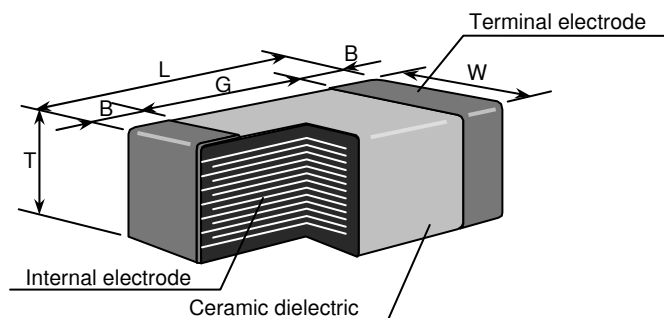
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Additional Information

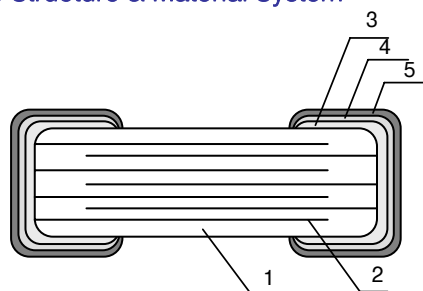
C0603 Series – High Q Capacitors

• 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 Directive¹ 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 Directive².

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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