(Chip array radial axial)
Capacitor selection

DIELECTRIC TYPE

The choice of dielectric is largely determined by the temperature stability required:

NPO

Ultra stable Class I dielectric, with predictable change of electrical properties on temperature, voltage, frequency and time. Used in circuits requiring stable performance.

X7R

Stable Class II dielectric, with predictable change of properties with temperature, voltage, frequency and time. Used as blocking, coupling, by-passing and frequency discriminating elements. This dielectric is ferroelectric and offers higher capacitance ranges than class I.

Y5V

General purpose Class II dielectric with highest dielectric constant and greater variation of properties with (Z5U) temperature and test conditions. Very high capacitance per unit volume and suited for bypass and coupling application as well as filtering, transient suppression blocking, and charge storage application.

CAPACITANCE VALUE & TOLERANCE

Determined by circuit requirements, NOTE that chip prices decrease with lower capacitance value and looser tolerances.

VOLTAGE

Determined by circuit requirements. Units are designed to exceed the withstanding voltage specification, i.e., the user need not incorporate an additional safety margin.

CAPACITOR TERMINATION

Termination choice is largely determined by the chip attachment method. Nickel barrier is recommended for units exposed to repeated solder cycles, to preclude leaching of the termination. Silver is used on units to be lead attached, as the more ductile silver minimizes thermal cycling hazards.

PACKAGING

Units are available in bulk, some sizes on tape & reel. Specify if reeled.

NONSTANDARD TESTING

CHIP CAP will test to specific customer requirements; consult factory.

MLCC – NPO (COG)

NPO/COG for General-use is class I high frequency capacitor, its capacitance is very stable, almost will not change along with the temperature, voltage and time. Specially be suitable for high frequency circuits.

FEATURES

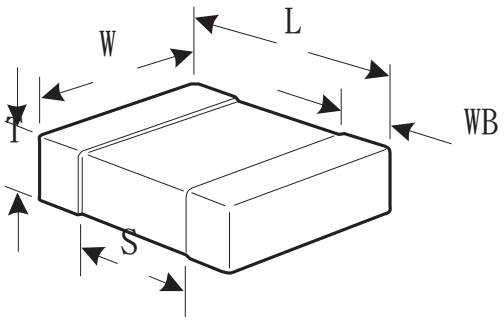
- Miniature size
- Wide capacitance, TC, voltage and tolerance range
- Industry standard sizes
- Available for wave, reflow or vapor phase solder

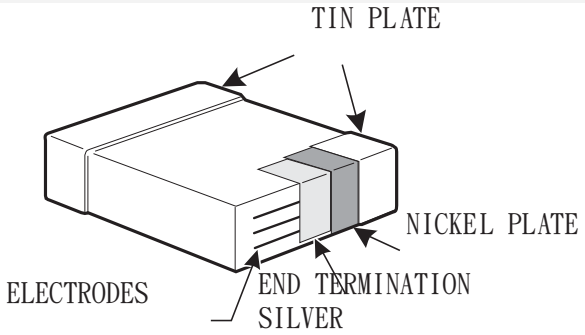
HOW TO ORDER

0805	CG	102	J	500	N	T
A	B	C	D	E	F	G

Size Code	Dielectric		Capacitance(pF)		Tolerance		Rated Voltage		Termination		Packaging Style	
0402	CG	COG	1R0	1pF	B	±0.10pF	160	16V	S	Silver	No Mark	Bulk
0603		(NPO)	100	10pF	C	±0.25pF	250	250V	N	Nickel Barrier	T	Tape & Reel
0805			101	100pF	D	±0.5pF	500	50V		Tin Plating	B	Bulk Package
1206			102	1000pF	F	±1.0%	630	63V				
			103	10000pF	G	±2.0%	101	100V				
					J	±5.0%	201	200V				
					K	±10%	501	500V				
					M	±20%	102	1000V				
							202	2000V				

TERMINATION DIAGRAMS





NOTE: Other Termination Available Upon Request (Contact Factory)

MLCC – NPO (COG)

SIZE CODE CAPACITANCE and VOLTAGE

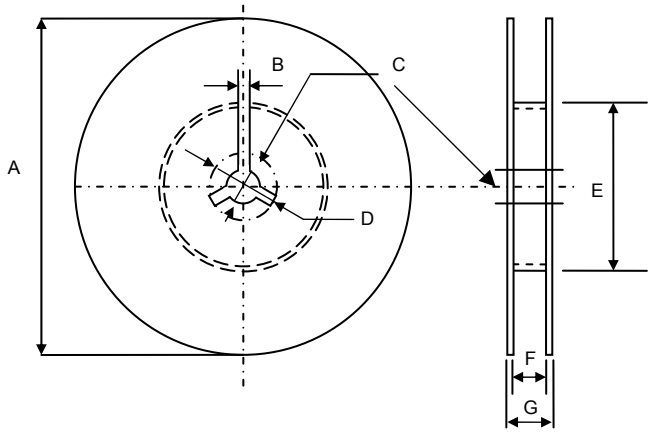
Type		Dimension(mm)				Voltage	Capacitance(pF)
Size Code	Metric Expression	L	W	T	WB		NPO(COG)
0402	1005	1.00±0.05	0.50±0.05	0.50±0.05	0.25±0.1	10V	0R5~471
						16V	0R5~471
						25V	1R0~471
						50V	1R0~221
0603	1608	1.60±0.1	0.80±0.10	0.80±0.1	0.30±0.1	25V	0R5~102
						50V	0R5~102
						100V	0R5~561
						200V	0R5~331
0805	2012	2.00±0.20	1.25±0.20	0.80±0.10	0.5±0.25	25V	0R5~472
						50V	0R5~472
				1.00±0.10		100V	0R5~102
						200V	0R5~821
				1.25±0.20		500V	0R5~471
1206	3216	3.20±0.30	1.60±0.20	0.80±0.10	0.50±0.25	25V	0R5~153
						50V	0R5~153
						100V	0R5~152
				1.00±0.10		200V	0R5~102
						500V	0R5~821
				1.25±0.20		1000V	0R5~471
						2000V	0R5~682
1210	3225	3.20±0.30	2.50±0.30	1.25±0.30	0.75±0.25	25V	561~153
						50V	561~153
						100V	561~472
						200V	101~472
				1.25±0.30		500V	101~222
						1000V	101~102
						2000V	101~561

PACKAGING

Structure and Dimension

Tape & Reel

A	B	C	D	E	F	G
178±2.00	3.00	13±0.50	21±0.80	50 min	10.0±1.50	12 max
330±2.00	3.00	13±0.50	21±0.80	50 min	10.0±1.50	12 max



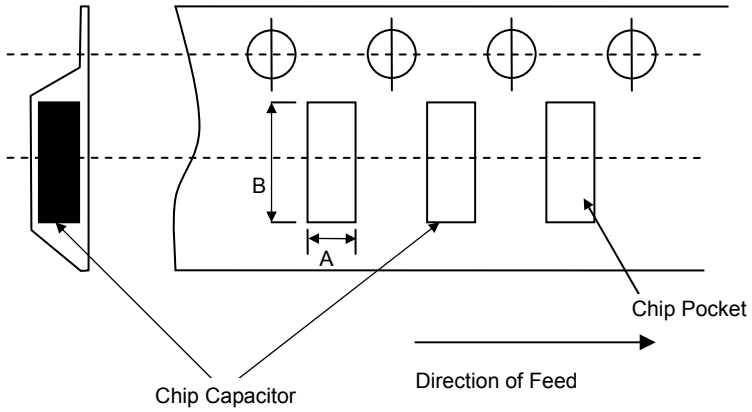
MLCC – NPO (COG)

Paper Tape

Size	A	B
0402	0.6±0.2	1.1±0.2
0603	1.1±0.2	1.4±0.2
0805	1.45±0.2	2.3±0.2
1206	1.8±0.2	3.4±0.2

Embossed Tape

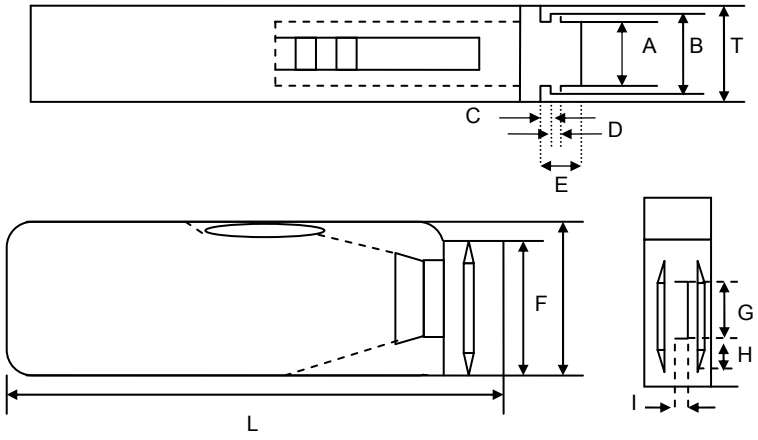
Size	A	B
0402	0.5±0.2	1.2±0.2
0603	0.8±0.2	2.0±0.2
0805	1.65±0.2	2.4±0.2
1206	2.0±0.2	3.6±0.2



Cartridge

Symbol	A	B	D	C	T	E
Dimension	6.8±0.1	8.8±0.1	12±0.1	15±0.1-0	2±0-0.1	4.7±0.1

Symbol	F	W	G	H	L	I
Dimension	31.5±0.2-0	36±0-0.2	19±0.35	7±0.35	110±0.7	5±0.35



Packaging Quantity

Size	Quantity		
	Paper Tape Taping	Embossed Taping	Normal Bulk
0402	10000		10000
0603	4000		4000
0805	4000	2000 / 3000	4000
1206	4000	2000 / 3000	4000
1210		2000 / 3000	
1812		1000	
2225			
3035			

MLCC – NPO (COG)

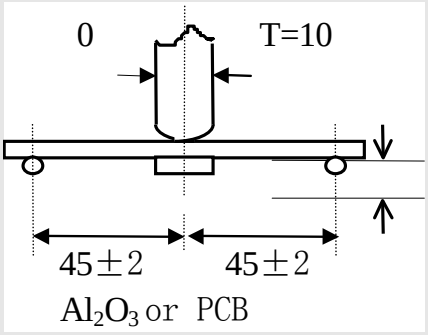
NPO(COG) DIELECTRIC CHARACTERISTIC INDUCTION & TEST METHOD

<table>
<tr><th>Item</th><th colspan="2">Specification</th><th>Test Method</th></tr>
<tr><td>Operating Temperature Range</td><td colspan="2">-55°C ~ 125°C</td><td></td></tr>
<tr><td>Appearance</td><td colspan="2">1. Good ceramic body color continuity
2. The chips have no visual damages and must be very smooth.
3. No exposed inner-electrode, cracks or holes
4. The outer electrode should have no cracks, holes damages or surface oxidation
5. No outer electrode prolongation or the prolongation is less than half of that of the termination width.</td><td>Check by using microscope ≥10X</td></tr>
<tr><td>Dimensions</td><td colspan="2">Within the specified dimensions</td><td>Using micrometer or vernier calipers</td></tr>
<tr><td>Capacitance</td><td colspan="2">Within the specified tolerance</td><td rowspan="2">1. Measuring Temperature: 25°C±5°C, Humidity: 30% ~ 75%
2. Measuring Voltage: 1.0±0.2V
3. Measuring Frequency:
C<1000pF, 1.0±0.1MHz,
C≥1000pF, 1.0±0.1KHz</td></tr>
<tr><td>Dissipation Factor (DF)</td><td colspan="2">≤0.15%</td></tr>
<tr><td>Insulation Resistance</td><td colspan="2">≥5x10^{10}Ω</td><td>Must measure at rated voltage and measure the IR within 60±5s</td></tr>
<tr><td>Withstanding Voltage</td><td colspan="2">>3Ur</td><td>Must measure at 3 times rated voltage, dwell time: 60±1s, no short and the changing/discharging current less than 50mA</td></tr>
<tr><td>Capacitance Temperature Characteristic</td><td colspan="2">Must meet the capacitor character temperature coefficient requirements within the operating temperature range</td><td>1. Pre-heat for 60±5min at 150+0/-10°C, then set it for 24±2hrs at room temperature
2. Measure the capacitance at -55~125°C or -55~85°C, the capacitance change ration comparing to that of 25°C must be within the specified range.</td></tr>
<tr><td>Solderability</td><td colspan="2">Tin coverage should be 95% of the outer electrode</td><td>Dip the capacitor into ethanol or colophony solution, and then dip it into 235±5°C eutectic solder solution for 2±0.5s. Dipping speed: 25±2.5mm/s</td></tr>
<tr><td>Resistance to Soldering</td><td>Appearance</td><td>No defects visible</td><td rowspan="4">1. Pre-heat for 60±5min at 150+0/-10°C, then set it for 24±2hrs at room temperature
2. Pre-heat the capacitor according to the chart below. Dip the capacitor into 260±5°C eutectic solder solution for 10±1s. Then set it for 24±2hrs at room temperature, then measure.

Dipping speed: 25±2.5mm/s

<table><tr><th>Stage</th><th>Temperature</th><th>Timer</th></tr><tr><td>1</td><td>100°C ~ 120°C</td><td>1 min.</td></tr><tr><td>2</td><td>170°C ~ 200°C</td><td>1 min.</td></tr></table></td></tr>
<tr><td></td><td>Capacitance Change Ratio</td><td>≤±2.5% or ±0.25pF (whichever larger)</td></tr>
<tr><td></td><td>D.F.</td><td>Max 0.15%</td></tr>
<tr><td></td><td>I.R.</td><td>More than 50000MΩ</td></tr>
</table>

MLCC – NPO (COG)

<table>
<tr><th>Item</th><th colspan="2">Specification</th><th>Test method</th></tr>
<tr><td>Adhesive Strength of Termination</td><td colspan="2">No removal of the terminations or other defect shall occur</td><td>Capacitors mounted on a substrate, a force of 5N applied perpendicular to the plane of the substrate and parallel to the line joining the center of the terminations for 10±1s</td></tr>
<tr><td rowspan="3">Vibration Resistance</td><td>Appearance</td><td>No defects or abnormities</td><td rowspan="3">Solder the capacitor to the test jig (glass epoxy resin board). The capacitor should be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55Hz, shall be traversed in approximately 1min. This motion shall be applied for a period of 2 hours in each 3 mutually perpendicular directions (a total of 6 hours).</td></tr>
<tr><td>Capacitance</td><td>Within the specified tolerance range</td></tr>
<tr><td>D.F.</td><td>Max 0.15%</td></tr>
<tr><td>Bending Resistance</td><td colspan="2">No removal of termination, crack or visible damage.</td><td>Capacitors mounted on a substrate. The board shall then be bent by 1mm at a rate of 1mm/sec with 10N force
 
</td></tr>
<tr><td>Temperature Cycle</td><td colspan="2">No damage or abnormities visible</td><td>1. Heat the capacitor for 60±5min at 150+0/10°C, and then set it for 24 2hrs at room temperature.
2. Perform five cycles according to the four heat treatments listed below. Set it for 24±2hrs at room temperature, then measure.
<table><tr><th>Stage</th><th>Temperature(°C)</th><th>Time(min.)</th></tr><tr><td>1</td><td>Lowest operating temperature ±3</td><td>30±3</td></tr><tr><td>2</td><td>Normal Temperature</td><td>2~3</td></tr><tr><td>3</td><td>High operating temperature ±2</td><td>30±3</td></tr><tr><td>4</td><td>Normal temperature</td><td>2~3</td></tr></table></td></tr>
<tr><td rowspan="4">Humidity Steady State & Laod</td><td>Appearance</td><td>No defects or abnormities</td><td rowspan="4">Set the capacitor for 500+24/-0 hours at the condition of 40±2°C and 90-95% humidity. Then remove and set it for 24±2 hours at room temperature, then measure.

Load: Apply rated voltage to the capacitor for 500+24/-0 hours at the condition of 40±2°C and 90-95% humidity. Remove and set it for 24±2 hours at room temperature, then measure.</td></tr>
<tr><td>Capacitance Change Ratio</td><td>≤±5% or ±0.5pF (whichever larger)</td></tr>
<tr><td>D.F.</td><td>Max 0.15%</td></tr>
<tr><td>I.R.</td><td>More than 10000MΩ</td></tr>
<tr><td rowspan="4">Life Test</td><td>Appearance</td><td>No defects or abnormities</td><td rowspan="4">1. Apply two times the rated voltage to the capacitor for 1000±12 hours at the upper temperature limits, the charging current should be less than 50mA.
2. Remove and set it for 24±2 hours at room temperature, then measure.</td></tr>
<tr><td>Capacitance Change Ratio</td><td>≤±5% or ±0.5pF (whichever larger)</td></tr>
<tr><td>D.F.</td><td>Max 0.15%</td></tr>
<tr><td>I.R.</td><td>More than 10000MΩ</td></tr>
</table>

Multilayer Ceramic Capacitors – X7R

Features

- Miniature size
- Wide capacitance, TC, voltage and tolerance range
- Industry standard sizes
- Available for wave, reflow or vapor phase solder

How to Order

0805	B	104	K	500	N	T
↑	↑	↑	↑	↑	↑	↑
A	B	C	D	E	F	G

A

Size Code Inches	
0402	0.04×0.02
0603	0.06×0.03
0805	0.08×0.05
1206	0.12×0.06
1210	0.12×0.10
1812	0.18×0.12
2225	0.22×0.25
3035	0.30×0.35

B

Dielectric	
B	X7R
X	X5R

C

Normal Capacitance	
102	10×10^{2}
103	10×10^{3}

Express by three figures. Unit used is pF (pico-farad)

First two figures are significant digit, third figure expresses number of zeros which follow the two significant digit

If there is a decimal place it is represented by a “R”. In this scenario all figures are significant digit

D

Tolerance	
K	±10%
M	±20%

E

Rated Voltage	
160	16×10^{0}
250	25×10^{0}
500	50×10^{0}
630	63×10^{0}
101	10×10^{1}
201	20×10^{1}
501	50×10^{1}
102	10×10^{2}
202	20×10^{2}

F

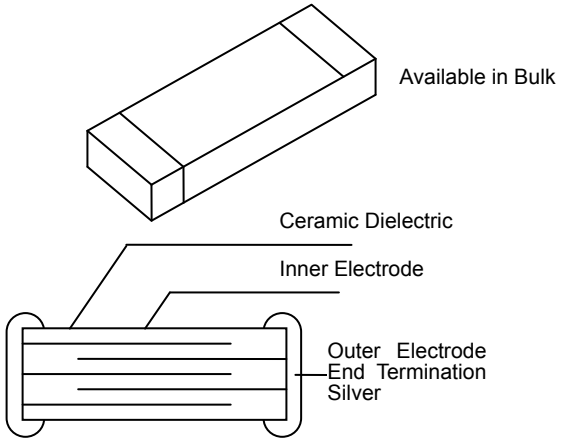
Termination	
S	Silver
N	Nickel Barrier Tin plating

G

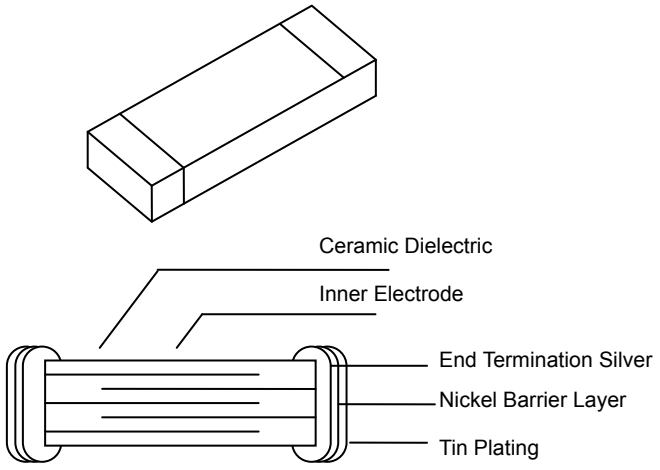
Packaging Style	
T	Tape & Reel
B	Bulk Package

Termination Diagrams

Standard



Barrier Layer



NOTE: Other Termination Available Upon Request (Contact Factory)

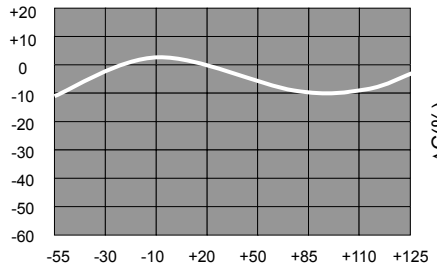
X7R - Dielectric Characteristic Introduction & Test Method (Table 1)

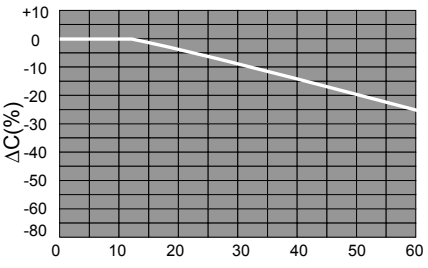
Item	Specification		Test Method
Capacitance	(100PF～2.2uF)		1KHz±10%,1.0±0.2Vrms
Capacitance Tolerance	K=±10% M=±20% S=±50%/-20%		
Rated Voltage	16、25、50、63、100、200、 500、1000、2000VDC		
Dissipation Factor (DF)	1000、2000VDC DF:<0.25%(100V) <3.0%(50V、25V） <3.5%(16V)		
Insulation Resistance (IR)	C≤25nF:R>4000MΩ C>25nF:RxC>100S		Test Voltage: rating voltage Charging time:1min Temperture:18～25°C Humidity:<80°C
Dielectric Withstanding Voltage	There shall be no evidence of damage or flash over during the test.		Apply 2.5 x rating voltages to both Terminations for 5 seconds. Charge and discharge current are less than 50mA.
Termination Adhesion	There shall be no evidence of damage during the test.		Test Condition:5N:10±1s
Bending Strength	There shall be no evidence of damage during the test; capacitance tolerance shall be not more than 10%.		After soldering capacitor on the PCB, 1mm of bending shall be applied for 1 second as shown by Drawing.
Solderabillity	Termination area shall be at least 80% covered with a new solder coating. There shall be no crack and ceramic exposure of terminated surface by melting.		The capacitors are completely immersed during 2 in the molten rosin, Then immersed 10mm during 2±1s in the molten solder with a temperature of 235±5°C.Pick up the capacitors-and cleaned with solvent, and put in on the> 10 times microscope.
Resistance to Soldering Heat	Type	X7R(B)	
	Temp	265±5°C	
	Time	5±1s	
	Cover%	≥85%	
	△C/C	-5~+10%	

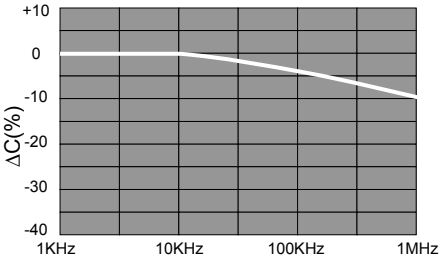
X7R - Dielectric Characteristic Introduction & Test Method (Table 2)

Item	Specification		Test Method	
Temperature Cycling	Type	X7R	Condition	X7R
	△C/C	≤1%	Temp.Oa	-55±3°C
			Temp.Ob	+125±3°C
	There shall be no evidence of damage during the test.		Cycle times	5 times 30min/time
			Resume time	24h
			Changing times	2～3min
Humidity & Moisture Resistance	Type	X7R	Permanent moisture: T=40±2°C t=21d Relative humidity：93+2%-3% Resume time：1～2h	
	△C/C	≤10%		
	DF	0.05		
	IR	RxC>25s		
	There shall be no evidence of damage during the test.			
T.C. Characteristics	Dielectric	△C/C	Dielectric	T.C
	X7R	±15°C	X7R	+20°C→-55°C→+20°C→+125°C
Vibration	There shall be no evidence of damage during the test.		Vibration frequency: f=10～500HZ Vibration range:0.75mm/s2 in 3 direction:2h/direction	
Bump	Type	X7R	4000 addeleration :390m/s2 Pulse duration:6ms	
	△C/C	≤2%		
	There shall be no evidence of damage during the test.			
Life test	Type	X7R	Condition	X7R
	△C/C	≤2%	Temp	+125°C
	DF	0.003	Time	T=100th
	IR	RxC>25s	Voltage	V=1.5Vr
	There shall be no evidence of damage during the test.		Resume time	24±1h
6 grade failure test	Type	X7R	Condition	X7R
	△C/C	≤10%	Creditability	60%
	DF	0.05	Temp	+125°C
	IR	RxC>25s	Voltage	Rating Voltage
	There shall be no evidence of damage during the test.		Time	1000h

Typical Characteristic







Multilayer Ceramic Capacitors – X7R

Size Code Capacitance And Voltage(Table 1)

Size Code	Dimension (mm)				Voltage	Capacitance (pF)
	L	W	T	Me		X7R
0402	1.0±0.05	0.5±0.05	0.5±0.05	0.1±0.05	10V	101~105
					16V	101～223
					25V	101～103
					50V	101～392
0603	1.6±0.1	0.8±0.10	0.8±0.1	0.3±0.1	25V	101～333
					50V	101～223
					100V	101～472
					200V	
0805	2.00±0.20	1.25±0.20	$0.7\pm^{0.3}_{0.2}$ 1.25±0.15 $1.0\pm^{0.3}_{0.2}$	0.5±0.25	25V	331～104
					50V	331～473
					100V	331～223
					200V	222～153
					500V	222～123
1206	3.20±0.30	1.60±0.20	$1.0\pm^{0.3}_{0.2}$ $1.25\pm^{0}_{0.2}$	0.5±0.25	25V	102～224
					50V	102～104
					100V	102～683
					200V	221～223
					500V	221～223
					1000V	221～472
					2000V	680～102
1210	3.20±0.30	2.50±0.30	$1.0\pm^{0.3}_{0.2}$ 1.25±0.3	0.70±0.25	25V	102～334
					50V	102～224
					100V	102～104
					200V	102～683
					500V	222～473
					1000V	102～153
					2000V	181～152
1812	4.50±0.40	3.20±0.30	2.5	1.00±0.25	25V	103～474
					50V	103～334
					100V	103～224
					200V	682～104
					500V	472～124
					1000V	222～273
					2000V	331～332

Size Code Capacitance and Voltage (Table 2)

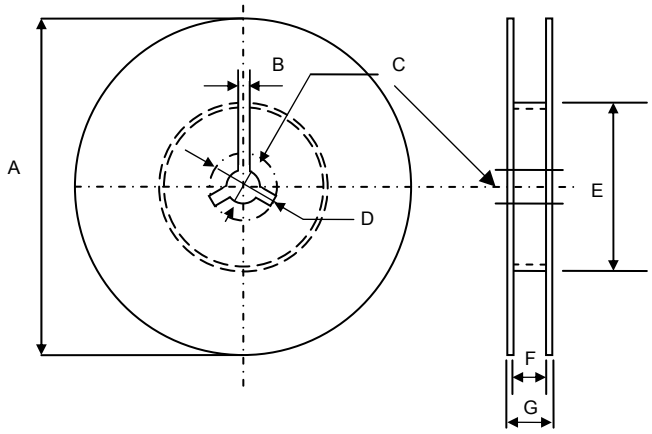
Size Code	Dimension (mm)				Voltage	Capacitance (pF)
	L	W	T	Me		X7R
2225	5.70±0.50	6.40±0.50	2.5	1.00±0.25	25V	103～105
					50V	103～105
					100V	103～474
					200V	153～424
					500V	183～394
					1000V	822～104
					2000V	122～103
3035	7.60±10.50	9.00±0.50	3.0	1.00±0.25	25V	103～225
					50V	103～225
					100V	103～105
					200V	103～125
					500V	682～105
					1000V	
					2000V	

Packaging

Structure and Dimension

Tape & Reel

A	B*	C	D*	E	F	G
178±2.0	3.0	13±0.5	φ32	50MIN	10.0±	14.9
				φ±1	1.5	12±2.0

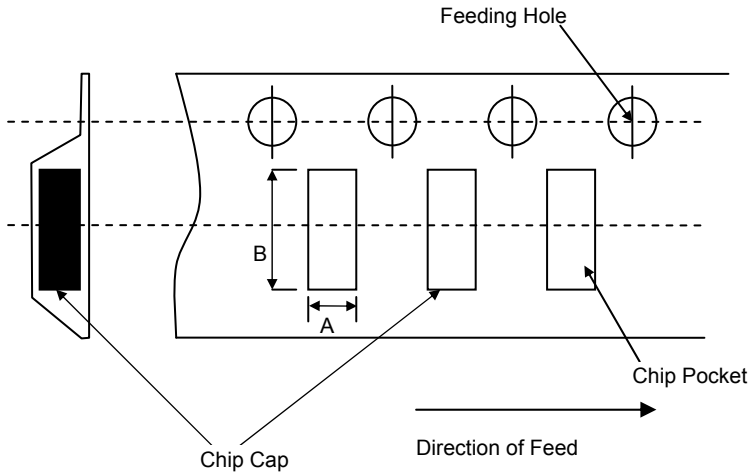


Paper Tape

Size	A	B
0402	0.6±0.2	1.1±0.2
0603	1.1±0.2	1.4±0.2
0805	1.45±0.2	2.3±0.2
1206	1.8±0.2	3.4±0.2

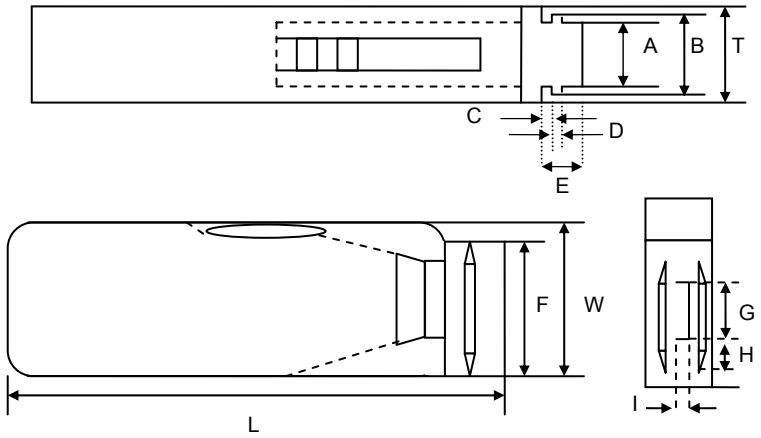
Plastic Tape (Te)

Size	A	B
0402	0.5±0.2	1.2±0.2
0603	0.8±0.2	2.0±0.2
0805	1.65±0.2	2.4±0.2
1206	2.0±0.2	3.6±0.2



Cartridge

Symbol	A	B	D	C	T	E
Dimension	6.8±0.1	8.8±0.1	12±0.1	15±0.1-0	2±0-0.1	4.7±0.1
Symbol	F	W	G	H	L	I
Dimension	31.5±0.2-0	36±0-0.2	19±0.35	7±0.35	110±0.7	5±0.35



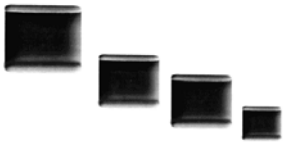
Packaging Quantity

Size	Quantity		
	Paper Tape Taping	Plastic Embossed Tapping	Bulk Packaging
0402	10000		10000
0603	4000		4000
0805	4000	2000 / 3000	4000
1206	4000	2000 / 3000	4000
1210		2000 / 3000	2000
1808		2000 / 3000	2000
1812		1000	2000
2225			
3035			

Multilayer Ceramic Capacitors – Y5V

Features

- Miniature size
- Wide capacitance, TC, voltage and tolerance range
- Industry standard sizes
- Available for wave, reflow or vapor phase solder



How to Order

0805	F	104	Z	500	N	T
↑	↑	↑	↑	↑	↑	↑
A	B	C	D	E	F	G

A

Size Code Inches	
0402	0.04×0.02
0603	0.06×0.03
0805	0.08×0.05
1206	0.12×0.06
1210	0.12×0.10
1812	0.18×0.12
2225	0.22×0.25
3035	0.30×0.35

B

Dielectric	
F	Y5V

C

Normal Capacitance	
102	10×10^{2}
103	10×10^{3}

Express by three figures. Unit used is pF (pico-farad)

First two figures are significant digit, third figure expresses number of zeros which follow the two significant digit

If there is a decimal place it is represented by a “R”. In this scenario all figures are significant digit

D

Tolerance	
M	±20%
Z	+80%~-20%

E

Rated Voltage	
160	16×10^{0}
250	25×10^{0}
500	50×10^{0}
630	63×10^{0}
101	10×10^{1}
201	20×10^{1}
501	50×10^{1}
102	10×10^{2}
202	20×10^{2}

F

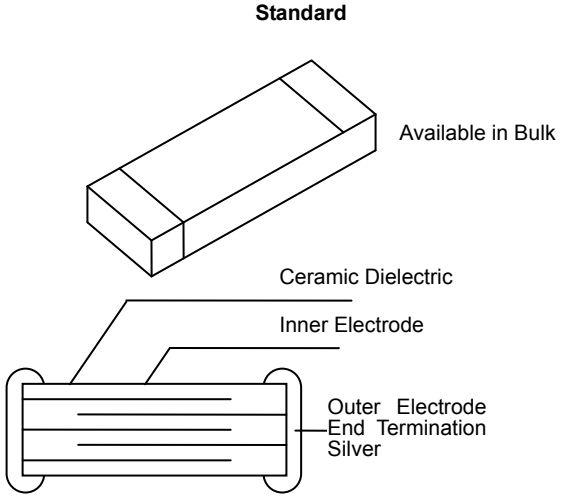
Termination	
S	Silver
N	Nickel Barrier Tin plating

G

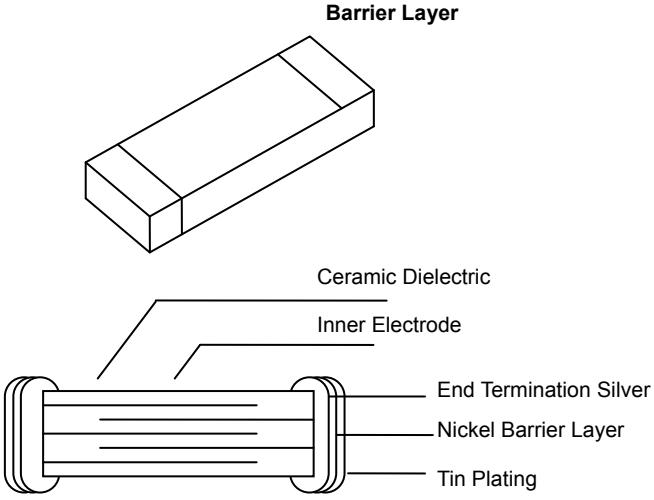
Packaging Style	
T	Tape & Reel
B	Bulk Package

Termination Diagrams

Standard



Barrier Layer



NOTE: Other Termination Available Upon Request (Contact Factory)

Multilayer Ceramic Capacitors – Y5V

Y5V Dielectric Characteristic Introduction & Test Method (Table 1)

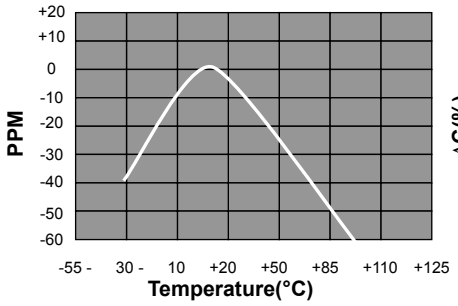
<table>
<tr><th>Item</th><th colspan="4">Specification</th><th colspan="2">Test Method</th></tr>
<tr><td>Capacitance</td><td colspan="4">(1000PF～10uF)</td><td colspan="2" rowspan="4">1KHz±10%,1.0±0.2Vrms</td></tr>
<tr><td>Capacitance Tolerance</td><td colspan="4">M=±20%
S=±50%/-20%
Z=±80%/-20%
P=±100%</td></tr>
<tr><td>Rated Voltage</td><td colspan="4">16、25、50、63、100VDC</td></tr>
<tr><td>Dissipation Factor (DF)</td><td colspan="4">DF≤3.5%(C<100nF)
DF≤7.0%(C≥100nF)</td></tr>
<tr><td>Insulation Resistance (IR)</td><td colspan="4">C<25nF:R>4000MΩ
C>25nF:R*C>100s</td><td colspan="2">Test Voltage: rating voltage
Charging time:1min
Temperture:18～25°C
Humidity:<80%</td></tr>
<tr><td>Dielectric Withstanding Voltage</td><td colspan="4">There shall be no evidence of damage or flash over during the test.</td><td colspan="2">There shall be no evidence of damage or flash over during the test.</td></tr>
<tr><td>Termination Adhesion</td><td colspan="4">There shall be no evidence of damage during the test.</td><td colspan="2">There shall be no evidence of damage during the test.</td></tr>
<tr><td>Bending Strength</td><td colspan="4">There shall be no evidence of damage during the test, capacitance tolerance shall be not more than 10%.</td><td colspan="2">There shall be no evidence of damage during the test; capacitance tolerance shall be not more than 10%.</td></tr>
<tr><td>Solderabillity</td><td colspan="4">Termination area shall be at least 80% covered with a new solder coating. There shall be no crack and ceramic exposure of terminated surface by melting.</td><td colspan="2" rowspan="6">Termination area shall be at least 80% covered with a new solder coating. There shall be no crack and ceramic exposure of terminated surface by melting.</td></tr>
<tr><td rowspan="5">Resistance to Soldering Heat</td><td colspan="2">Type</td><td colspan="2">Y5V</td></tr>
<tr><td colspan="2">Temp</td><td colspan="2">265±5°C</td></tr>
<tr><td colspan="2">Time</td><td colspan="2">5±1s</td></tr>
<tr><td colspan="2">Cover%</td><td colspan="2">≥85%</td></tr>
<tr><td colspan="2">△C/C</td><td colspan="2">-5～+10%</td></tr>
<tr><td rowspan="5">Temperature Cycling</td><td>Type</td><td colspan="3">Y5V</td><td>Condition</td><td>Y5V</td></tr>
<tr><td rowspan="2">△C/C</td><td colspan="3" rowspan="2">≤1%</td><td>Temp.Oa</td><td>-25±3°C</td></tr>
<tr><td>Temp.Ob</td><td>+85±3°C</td></tr>
<tr><td colspan="4" rowspan="3">There shall be no evidence of damage during the test.</td><td>Cycle times</td><td>5 times 30min/time</td></tr>
<tr><td>Resume time</td><td>24h</td></tr>
<tr><td>Changing times</td><td>2～3min</td></tr>
</table>

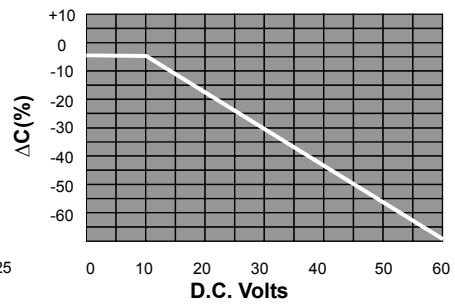
Multilayer Ceramic Capacitors – Y5V

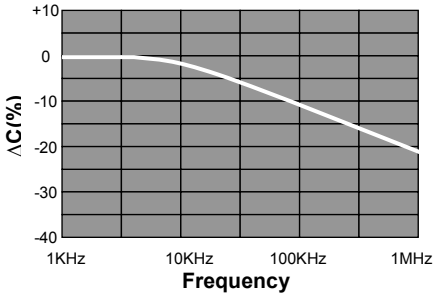
Y5V Dielectric Characteristic Introduction & Test Method (Table 2)

Item	Specification		Test Method	
Humidity & Moisture Resistance	Type	Y5V	Permanent moisture: T=40±2°C t=21d Relative humidity：93+2%-3% Resume time：1～2h	
	△C/C	≤20%		
	DF	0.07		
	IR	RxC>25s		
	There shall be no evidence of damage during the test.			
T.C. Characteristics	Dielectric	△C/C	Dielectric	T.C
	Y5V	±22～-82%	Y5V	+20°C→-25°C→+20°C→+85°C
Vibration	There shall be no evidence of damage during the test.		Vibration frequency: f=10～500HZ Vibration range:0.75mm/s2 in 3 direction:2h/direction	
Bump	Type	Y5V	4000 adder speed:390m/s2 Pulse duration:6ms	
	△C/C	≤2%		
	There shall be no evidence of damage during the test.			
Life test	Type	Y5V	Condition	Y5V
	△C/C	≤30%	Temperature	+125°C
	DF	0.05	time	T=100th
	IR	RxC>25s	Voltage	V=1.5Vr
	There shall be no evidence of damage during the test.		Resume time	24±1h
6 grade failure test	Type	Y5V	Condition	Y5V
	△C/C	≤10%	Creditability	60%
	DF	0.05	Temperature	+125°C
	IR	RxC>25s	Voltage	Rating Voltage
	There shall be no evidence of damage during the test.		time	1000 小时

Typical Characteristics







Multilayer Ceramic Capacitors – Y5V

Size Code Capacitance and Voltage (Table 1)

	Dimension(Mm)				Voltage	Capacitance (Pf)
Size Code	L	W	T	ME		Y5V
0402	1.0±0.05	0.5±0.05	0.5±0.05	0.1±0.05	16V	102～104
					25V	102～223
					50V	102～153
0603	1.6±0.1	0.8±0.10	0.8±0.1	0.3±0.1	25V	222～224
					50V	222～154
					100V	
					200V	
0805	2.00±0.20	1.25±0.20	$0.7\pm^{0.3}_{0.2}$ 1.25±0.15 $1.0\pm^{0.3}_{0.2}$	0.5±0.25	25V	103～105
					50V	103～684
					100V	103～224
					200V	
					500V	
1206	3.20±0.30	1.60±0.20	$1.0\pm^{0.3}_{0.2}$ $1.25\pm^{0}_{0.2}$	0.5±0.25	25V	103～125
					50V	103～105
					100V	
					200V	
					500V	
					1000V	
					2000V	
1210	3.20±0.30	2.50±0.30	$1.5\pm^{0.3}_{0.2}$ 1.25±0.3	0.70±0.25	25V	104～155
					50V	104～155
					100V	104～105
					200V	
					500V	
					1000V	
					2000V	
1812	4.50±0.40	3.20±0.30	2.5	0.75±0.25	25V	154～335
					50V	154～225
					100V	104～105
					200V	
					500V	
					1000V	
					2000V	

Size Code Capacitance And Voltage (Table 2)

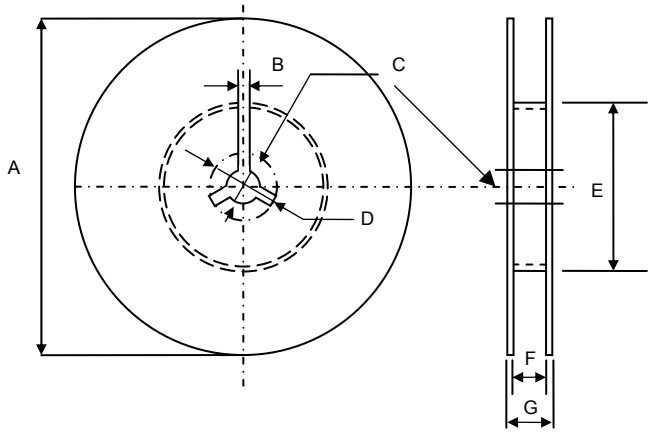
	Dimension(Mm)				Voltage	Capacitance (Pf)
Size Code	L	W	T	Me		Y5V
2225	5.70±0.50	6.40±0.50	2.5	0.75±0.25	25V	684～475
					50V	684～335
					100V	
					200V	
					500V	
					1000V	
					2000V	
3035	7.60±10.50	9.00±0.50	3.0	1.00±0.25	25V	105～106
					50V	105～685
					100V	
					200V	
					500V	
					1000V	
					2000V	

Packaging

Structure and Dimension

Tape & Reel

A	B*	C	D*	E	F	G
178±2.0	3.0	13±0.5	φ32	50MIN	10.0±	14.9
				φ±1	1.5	12±2.0

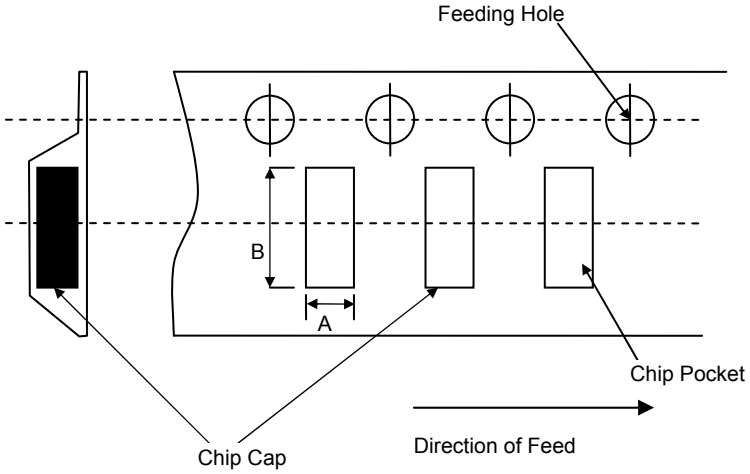


Paper Tape

Size	A	B
0402	0.6±0.2	1.1±0.2
0603	1.1±0.2	1.4±0.2
0805	1.45±0.2	2.3±0.2
1206	1.8±0.2	3.4±0.2

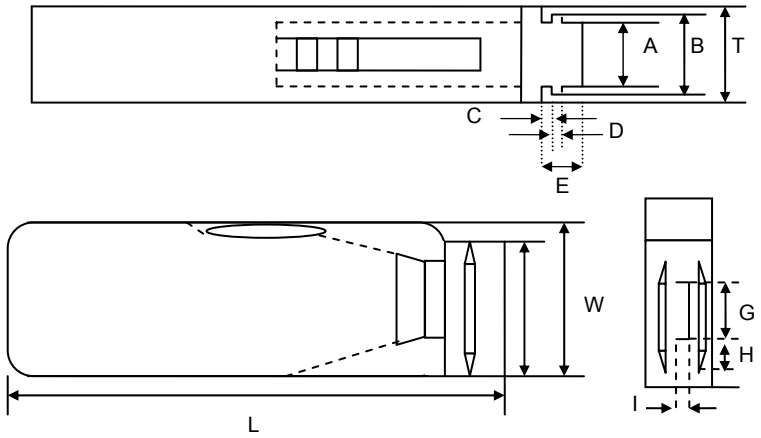
Plastic Tape(Te)

Size	A	B
0402	0.5±0.2	1.2±0.2
0603	0.8±0.2	2.0±0.2
0805	1.65±0.2	2.4±0.2
1206	2.0±0.2	3.6±0.2



Cartridge

Symbol	A	B	D	C	T	E
Dimension	6.8±0.1	8.8±0.1	12±0.1	15±0.1-0	2±0-0.1	4.7±0.1
Symbol	F	W	G	H	L	I
Dimension	31.5±0.2-0	36±0-0.2	19±0.35	7±0.35	110±0.7	5±0.35



Packaging Quantity

Size	Quantity		
	Paper Tape Taping	Plastic Embossed Tapping	Bulk Packaging
0402	10000		10000
0603	4000		4000
0805	4000	2000 / 3000	4000
1206	4000	2000 / 3000	4000
1210		2000 / 3000	2000
1808		2000 / 3000	2000
1812		1000	2000
2225			
3035			