Features

- Miniature size, large capacitance, ammo packaging suitable for auto-placement
- Epoxy resin coating creates excellent performance in humidity resistance, mechanical strength and heat resistance
- Standard size, various lead configuration
- RoHS Compliant

How to Order

CC4	0603	Y	6104	M	500	P	F3
A	B	C	D	E	F	G	H

A

Product Type	
CODE	TYPE
CC4	Radial Leads

B

Size Code	
Code	Size
0603	0603
0805	0805
1206	1206
1210	1210
1812	1812
2225	2225
3035	3035

C

Dielectric	
N	COG(NPO)
B	X7R
Y	Y5V

D

Capacitance(pF)	
1R2	1.2pF
100	10pF
101	100pF
102	1000pF
103	10000pF

(104=6104
103=5103
101=3101)

E

Tolerance	
B	±0.10pF
C	±0.25pF
D	±0.5pF
F	±1.0%
G	±2.0%
J	±5.0%
K	±10%
M	±20%
S	+50% ~ -20%
Z	+80% ~ -20%
P	+100% ~ -0%

B, C, D for Cap<10pF
NPO: B,C,D,F,G,J,K,M
X7R: K,M,S,Z
Y5V: M,S,Z,P

F

Rated Voltage	
160	16V
250	25V
500	50V
630	63V
101	100V

G

Packaging Style	
P	TAPE(AMMO)
B	BULK

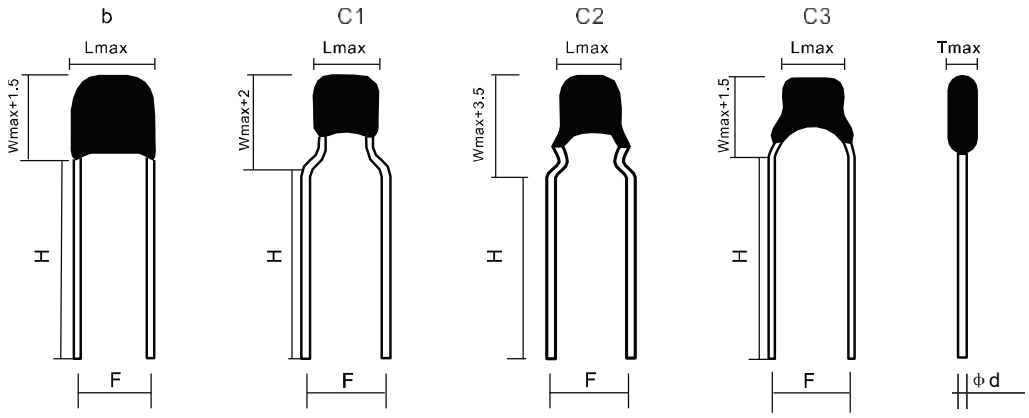
H

Lead Space (mm)	
F1	2.54
F2	4.57
F3	5.08
F4	7.50

Size Code Capacitance and Voltage of Radial Leads MLCC

Size Code	Shape	Dimensions (mm)					Voltage	Capacitance Ranges (pF)		
		F(±0.5)	H(±1)	Lmax	Wmax	Tmax		COG (N)	X7R (B)	Y5V(Y)
0603	a b c1 c2 c3 c1	2.54 2.54 5.08 5.08 5.08 7.5	5.0 10.0 5.0 10.0 5.0 5.0 10.0 5.0	3.8	3.8	3.0	25V 50V 100V	0R5~102 0R5~102 0R5~102	101~224 101~154 101~683	102~224 102~104 102~104
0805	a b c1 c2 c3 c1	2.54 2.54 5.08 5.08 5.08 7.5	5.0 10.0 5.0 10.0 5.0 5.0 10.0 5.0	4.2	3.8	3.8	25V 50V 100V	0R5~272 0R5~222 0R5~102	101~105 101~105 101~104	102~125 102~105 ---
1206	a b c1	2.54 3.50 5.08	10.0	5.0	4.5	3.8	25V 50V 100V	0R5~562 0R5~472 0R5~332	101~225 101~105 101~154	102~125 102~105 ---
1210	b c1	3.50 5.08	10.0	7.6	5.5	3.8	25V 50V 100V	100~103 100~103 5R0~103	471~105 471~105 101~105	472~155 472~205 ---
1812	b	4.57	10.0	8.5	8.5	3.8	25V 50V 100V	100~153 100~103 5R0~103	471~335 471~225 101~105	103~335 103~225 ---
2225	b	5.50	10.0	10.5	9.5	4.2	25V 50V 100V	100~473 100~273 5R0~273	102~475 102~335 101~105	103~475 103~335 103~205
3035	b	7.50	10.0	12.5	10.5	4.2	25V 50V 100V	102~104 102~473 102~333	103~225 103~225 103~105	105~106 105~685 105~685

*Other specifications available upon request, please contact us for more information



Ceramic Chip Capacitor Feature

Dielectric Material	(NPO/COG) (N/CG)	X7R(B)	Y5V(Y)
Dielectric Type	Stable Class I Dielectric	Stable Class II Dielectric	
Electrical Properties	With Negligible dependence of electrical properties on Temperature, Voltage, Frequency and Time	With predictable change of properties with Temperature, Voltage, Frequency and Time, this dielectric is FERRO-ELECTRIC and offers higher capacitance ranges than Class I	With high dielectric constant and greater variation of properties with temperature and test conditions, very high capacitance per unit volume
Application	Use in circuits requiring stable performance	Use as blocking, coupling, bypassing discriminating element	Suited for bypassing and coupling application such as store power and memory circuit
Capacitance Range	1pF – 10nF	100pF-1uF	1nF-4.7uF
Operating Temperature	0±30ppm/°C -55°C ~ +125°C	±15% -55°C ~ +125°C	+30% ~ -80% -55°C ~ +125°C

Test Standard and Conditions

Item	Test Standard		
	NPO/COG (N/COG)	X7R (B)	Y5V (Y)
Capacitance	The capacitance is in the tolerance	The capacitance is in the tolerance	The capacitance is in the tolerance
Dissipation Factor	⩽ 0.15%	⩽ 3.5%	⩽ 7.5% (below 220nF) ⩽10% (220nF ~ 470nF) ⩽15% (470nF ~ 1uF)
Insulation Resistance	C⩽10nF IR>10000MΩ C>10nF R.C>100s	C⩽25nF IR>4000MΩ C>25nF R.C>100s	
Voltage Test	Test Voltage: 2.5 rated voltage The charging current may not exceed 50mA. Duration of test: 5 seconds		
TEST CONDITION			
Frequency	1 MHz (C>1nF, 1 KHz)	1 KHz	
Test Voltage	1±0.2VDC		0.5±0.2VDC
Test Voltage of IR	The measuring voltage is equal to the rated voltage. The charging current may not exceed 50mA		
Standard atmospheres conditions	Unless otherwise specified, the standard range of atmospheric conditions for measuring and testing is as follows: **Ambient Temperature** 15°C ~35°C **Relative Humidity** 45%~75% **Air Pressure** 86Kpa~106Kpa (860-1060mbar) If there may be any doubt on the results, measurements shall be made within the following limits: **Ambient Temperature** 25°C±1°C **Relative Humidity** 45%~52% **Air Pressure** 86Kpa~106Kpa (860-1060mbar)		
Operating temperature range	The operating temperature range is the range of ambient temperatures at which the capacitor can be operated continuously at rated voltage. **Temperature compensation used:** NPO -55°C ~ +125°C X7R -55°C ~ +125°C Y5V -25°C ~ +85°C		

Requirement for Reliability Test

Item		Properties Requirement	Test Condition and Requirement
Appearance		No abnormality, sign in focus	Visual Inspection
Capacitance		In permissible tolerance	**Test condition** **Class I** Voltage 1±0.2V Frequency 1MHz±10% (C⩽1nF) 1KHz±10% (C>1nF) **Class II** Voltage 1±0.2V Frequency 1MHz±10%
Insulation Resistance		In permissible tolerance	Voltage: rated voltage Duration: 60±5s Charge / discharge current is less than 50mA
Withstanding Voltage	Between terminals Between terminals and body	There shall be no evidence of damage or flash over during the test	Voltage: 2.5 times rated voltage T=2s Charge / discharge current is less than 50mA

Withstanding solder heat

There shall be no visible defacing and sign in focus

Temp. Char.	ΔC/C ⩽
NPO	±0.5% or ±0.5pF
X7R	±10%
Y5V	±30%

Tin review: 260±5°C
Duration: 10s
Recovery time: 24±2h

Solder ability

Leads shall be covered with a new coating

Tin review: 230±5°C
Duration: 2s

Terminal Strength

No abnormality such as cut lead or looseness

Bending force: 0.25Kg
Duration: 5s
Repeat 2 times
Bent at an angle of 90° then returned to initial position, then bend in the opposite direction.

Temperature Cycle

No significant abnormality in appearance

Capacitance Range:
Class I: ⩽ 5% or ±0.5pF
Class II: B,E: ⩽ ±12.5%, Y: ⩽ ±30%

Dissipation Factor:
Class I: Not more than twice of the initial value
Class II: B,E: ⩽ ±5.0%, Y: ⩽ 12.5% (C_R ⩽ 0.1uF)
⩽ 15.0% (1uF > C_R > 0.1uF)
⩽ 17.5% (C_R ⩾ 1uF)

Insulation Resistance ⩾ 1000MΩ or 50MΩ · uF

Class I:
Recovery time: 1h under standard condition after test

Class II:
1h of preconditioning at 150 +10°C
Followed by 48±4h recovery time under standard condition

Number of Cycles: 5

Step	Temperature			Time(Min.)
	NPO/X7R	X5R	Y5V	
1	Room Temperature			2~3
2	-55	-25	+10	30
3	Room Temperature			2~3
4	+125	+85	+85	30
5	Room Temperature			2~3

High Temperature Loading Test

No significant abnormality in appearance

Capacitance Range:
Class I: ± 3% or ±0.3pF whichever is larger
Class II: B,E: ⩽ ±12.5%, Y: ⩽ ±30%

Class I: Not more than twice of the initial value
Class II: B,E: ⩽ 5.0%, Y: ⩽ 12.5% (C_R ⩽ 0.1uF)
⩽ 17.5% (C_R ⩾ 1uF)

Insulation Resistance ⩾ 500MΩ or 25MΩ · uF
Whichever is smaller

	Temperature	
NPO/X7R	X5R	Y5V
125	85°C	

Applied Voltage: 1.5 times rated voltag ə
Charge/Discharge current: < 50mA
Duration: 1000h (+48 ~ 0h)
Recovery time:
Class I Dielectric: 24±2h
Class II Dielectric: 48±4h

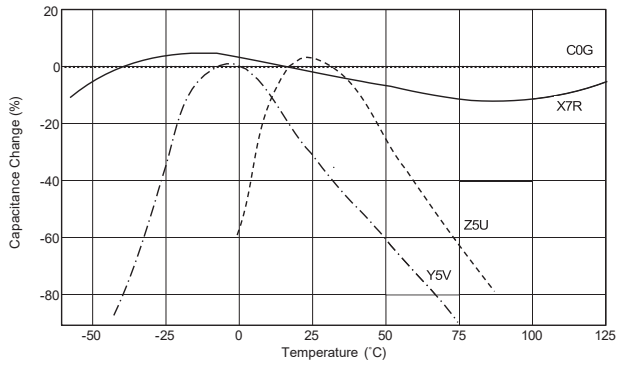
Solvent Resistance

Legible marking and no defects or abnormalities in appearance

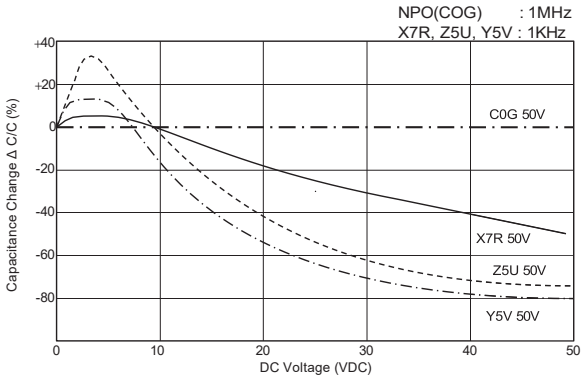
Solvent Temperature: 23±5°C
Put the sample in solvent for 1min, take out and brush sample's notation area 10 times with pledge, repeat 3 times

Characteristics Data

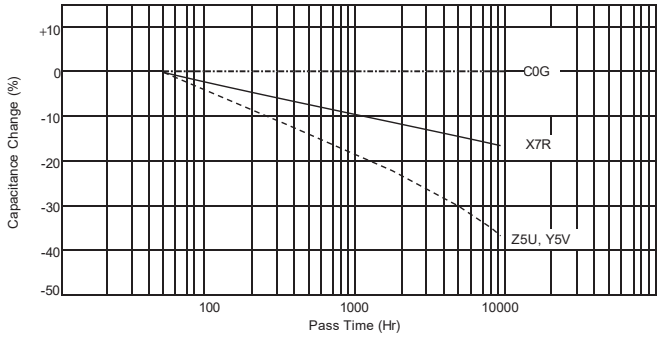
Temperature Characteristics



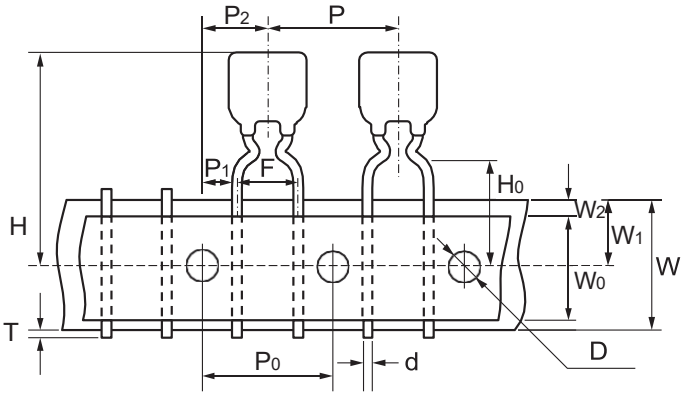
DC Voltage Characteristics

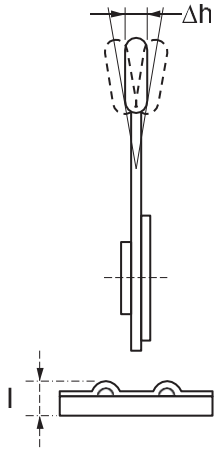


Capacitance Change - Aging

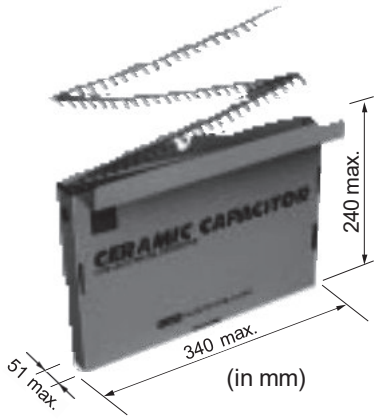


Packaging Style





Code	P	P_0	P_1	P_2	d	Δh	W	W_0	W_1	W_2	H	H_0	l	D	T
Measurements	12.7	12.7	3.85 5.1	6.35	0.5	0	18.5	13	9	3.0	32.25	15-20	1.42	4.0	0.7
Tolerance	±1	±0.8	±0.7	±1.3	±0.1	±1	±1	±1	±0.5	MAX	MAX	±0.5	MAX	MAX	MAX



Packaging Quantity

Type	Quantity
Ammo Package	2500 pcs
Bulk Package	1000 pcs / 500 pcs

*PACKAGING ACCORDING TO THE CUSTOMER REQUIREMENTS.
Notes：2.54mm leads space P1=5.1±0.7
5.08mm leads space P1=3.75±0.7