

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		B		C		D		E		F	
Product Type		Size Code		Dielectric		Capacitance(pF)		Tolerance		Rated Voltage	
CODE	TYPE	Code	Size	N	COG(NPO)	1R2	1.2pF	B	±0.10pF	160	16V
CC4	Radial	0603	0603	B	X7R	100	10pF	C	±0.25pF	250	25V
	Leads	0805	0805	Y	Y5V	101	100pF	D	±0.5pF	500	50V
		1206	1206			102	1000pF	F	±1.0%	630	63V
		1210	1210			103	10000pF	G	±2.0%	101	100V
		1812	1812			(104=6104		J	±5.0%		
		2225	2225			103=5103		K	±10%		
		3035	3035			101=3101)		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			
G		H									
Packaging Style		Lead Space (mm)									
P	TAPE(AMMO)	F1	2.54								
B	BULK	F2	4.57								
		F3	5.08								
		F4	7.50								

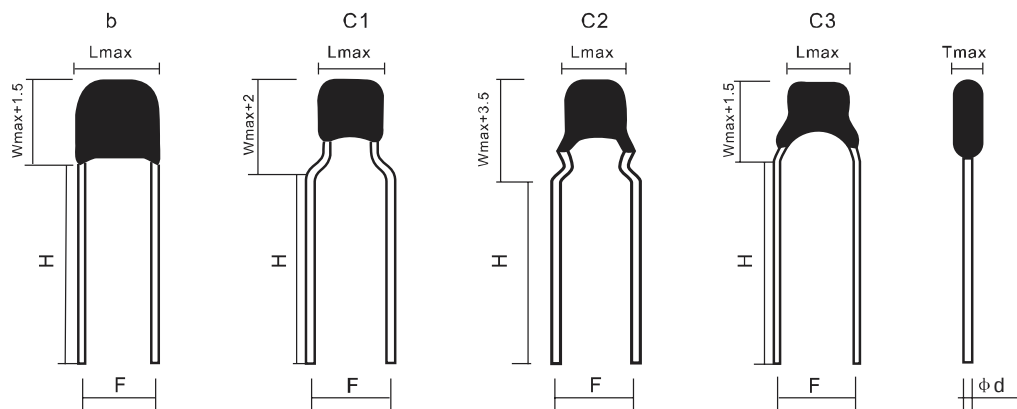
G		H	
Packaging Style		Lead Space (mm)	
P	TAPE(AMMO)	F1	2.54
B	BULK	F2	4.57
		F3	5.08
		F4	7.50



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	2.54	5.0							
	b	2.54	10.0							
	c1	5.08	5.0 10.0	3.8	3.8	3.0	25V	0R5~102	101~224	102~224
	c2	5.08	5.0				50V	0R5~102	101~154	102~104
	c3	5.08	5.0 10.0				100V	0R5~102	101~683	102~104
	c1	7.5	5.0							
0805	a	2.54	5.0							
	b	2.54	10.0							
	c1	5.08	5.0 10.0	4.2	3.8	3.8	25V	0R5~272	101~105	102~125
	c2	5.08	5.0				50V	0R5~222	101~105	102~105
	c3	5.08	5.0 10.0				100V	0R5~102	101~104	---
	c1	7.5	5.0							
1206	a	2.54					25V	0R5~562	101~225	102~125
	b	3.50	10.0	5.0	4.5	3.8	50V	0R5~472	101~105	102~105
	c1	5.08					100V	0R5~332	101~154	---
1210	b	3.50					25V	100~103	471~105	472~155
	c1	5.08	10.0	7.6	5.5	3.8	50V	100~103	471~105	472~205
							100V	5R0~103	101~105	---
1812	b	4.57	10.0	8.5	8.5	3.8	25V	100~153	471~335	103~335
							50V	100~103	471~225	103~225
							100V	5R0~103	101~105	---
2225	b	5.50	10.0	10.5	9.5	4.2	25V	100~473	102~475	103~475
							50V	100~273	102~335	103~335
							100V	5R0~273	101~105	103~205
3035	b	7.50	10.0	12.5	10.5	4.2	25V	102~104	103~225	105~106
							50V	102~473	103~225	105~685
							100V	102~333	103~105	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			
Dissipation Factor	$\leq 0.15\%$ $\leq 3.5\%$ $\leq 7.5\%$ (below 220nF) $\leq 10\%$ (220nF ~ 470nF) $\leq 15\%$ (470nF ~ 1uF)			
Insulation Resistance	C $\leq$ 10nF C $>$ 10nF	IR $>$ 10000MΩ R.C $>$ 100s	C $\leq$ 25nF C $>$ 25nF	IR $>$ 4000MΩ 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:			
Operating temperature range	Ambient Temperature		25°C±1°C	
	Relative Humidity		45%~52%	
	Air Pressure		86Kpa~106Kpa (860-1060mbar)	
	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		

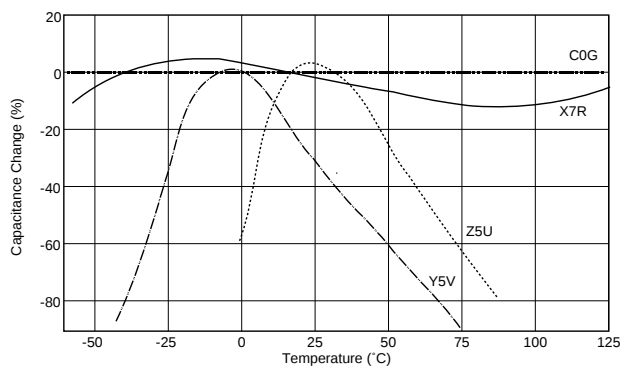
Requirement for Reliability Test

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)
Insulation Resistance	In permissible tolerance	Class II Voltage 1±0.2V Frequency 1MHz±10%
Withstanding Voltage	Between terminals Between terminals and body	There shall be no evidence of damage or flash over during the test Voltage: rated voltage Duration: 60±5s Charge / discharge current is less than 50mA Voltage: 2.5 times rated voltage T=2s Charge / discharge current is less than 50mA

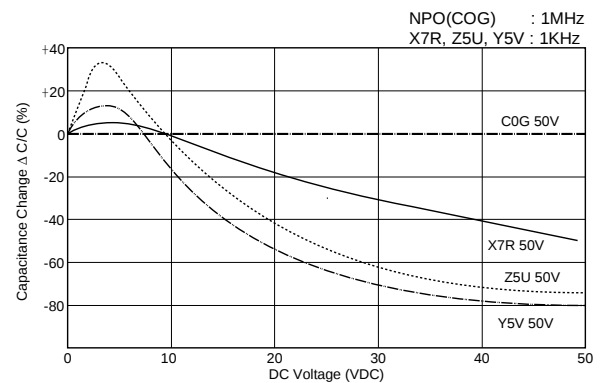
Withstanding solder heat	There shall be no visible defacing and sign in focus			Tin review: 260±5°C Duration: 10s Recovery time: 24±2h																																										
	Temp. Char.	ΔC/C ≤																																												
	NPO	±0.5% or ±0.5pF																																												
	X7R	±10%																																												
Y5V	±30%																																													
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.																																										
	No significant abnormality in appearance			Class I: Recovery time: 1h under standard condition after test																																										
Temperature Cycle	Capacitance Range:	Class I: ≤ 5% or ±0.5pF		Class II: 1h of preconditioning at 150 +10°C Followed by 48±4h recovery time under standard condition Number of Cycles: 5																																										
		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)																																												
High Temperature Loading Test	Insulation Resistance ≥ 1000MΩ or 50MΩ · uF Whichever is smaller			<table><tr><th>Step</th><th colspan="3">Temperature</th><th rowspan="2">Time(Min.)</th></tr><tr><th>NPO/X7R</th><th>X5R</th><th>Y5V</th></tr><tr><td>1</td><td colspan="3">Room Temperature</td><td>2~3</td></tr><tr><td>2</td><td>-55</td><td>-25</td><td>+10</td><td>30</td></tr><tr><td>3</td><td colspan="3">Room Temperature</td><td>2~3</td></tr><tr><td>4</td><td>+125</td><td>+85</td><td>+85</td><td>30</td></tr><tr><td>5</td><td colspan="3">Room Temperature</td><td>2~3</td></tr></table> <table><tr><th colspan="3">Temperature</th></tr><tr><th>NPO/X7R</th><th>X5R</th><th>Y5V</th></tr><tr><td>125°C</td><td colspan="2">85°C</td></tr></table> Applied Voltage: 1.5 times rated voltage Charge/Discharge current: < 50mA Duration: 1000h (+48 ~ 0h) Recovery time: Class I Dielectric: 24±2h Class II Dielectric: 48±4h 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	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	Temperature			NPO/X7R	X5R	Y5V	125°C	85°C	
	Step	Temperature			Time(Min.)																																									
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	2	-55	-25		+10	30																																								
3	Room Temperature			2~3																																										
4	+125	+85	+85	30																																										
5	Room Temperature			2~3																																										
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NPO/X7R	X5R	Y5V																																												
125°C	85°C																																													
Capacitance Range:		Class I: ± 3% or ±0.3pF whichever is larger																																												
		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 ≥ 500MΩ or 25MΩ · uF Whichever is smaller																																														
Solvent Resistance	Legible marking and no defects or abnormalities in appearance																																													

Characteristics Data

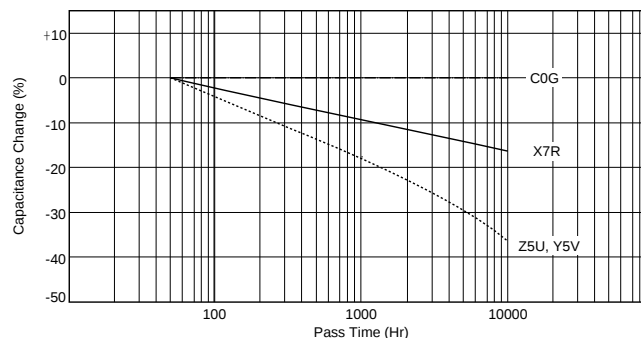
Temperature Characteristics



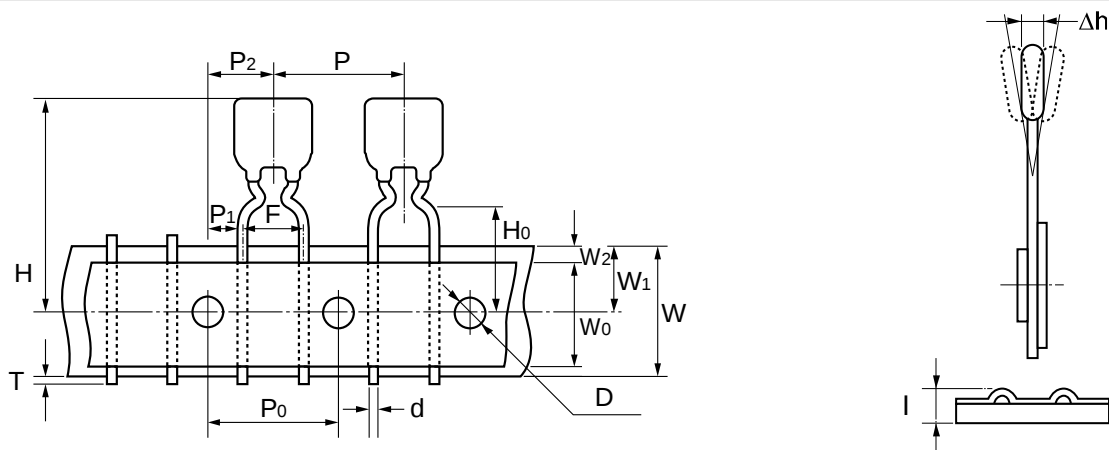
DC Voltage Characteristics



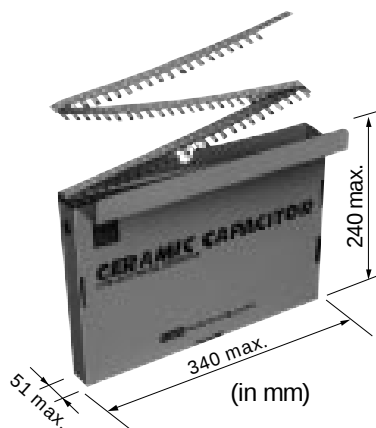
Capacitance Change - Aging



Packaging Style



Code	P	P ₀	P ₁	P ₂	d	Δh	W	W ₀	W ₁	W ₂	H	H ₀	I	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