

# INDEX

## Multilayer Ceramic Capacitors

### General Capacitors

Type	Dielectric	Size	Capacitance	Rated Voltage	Page
MC	NPO	0402,0603,0805,1206,1210,1812	0.5pF~0.039uF	16V,25V, 50V,100V	4
	X7R	0402,0603,0805,1206,1210,1812	100pF~4.7uF	10V,16V,25V, 50V,100V	5
	X5R	0402,0603,0805,1206	0.027uF~10uF	6.3V,10V,16V	6
	Y5V	0402,0603,0805,1206,1210,1812	0.01uF~47uF	6.3V,10V,16V,25V,35V,50V,100V	6

### Middle and High Voltage Capacitors

Type	Dielectric	Size	Capacitance	Rated Voltage	Page
MC	NPO	0603,0805,1206,1210,1808,1812	0.5pF~6800pF	200V,250V,500V,630V,1KV, 2KV,3KV	8
	X7R	0805,1206,1210,1808,1812	100pF~0.47uF	200V,250V,500V,630V,1KV,1.5KV,2KV,3KV	9
	Y5V	0805,1206,1210, 1812	1000pF~0.022uF	200V,250V	10

### Ultra-small Capacitors

Type	Dielectric	Size	Capacitance	Rated Voltage	Page
MC	NPO	0201 <b>NEW</b>	0.5pF~100pF	16V,25V	11
	X7R	0201 <b>NEW</b>	100pF~4700pF	16V,25V,50V	11
	X5R	0201 <b>NEW</b>	1000pF~0.022uF	6.3V,10V,16V	11

### High Q and Low ESR Capacitors

Type	Dielectric	Size	Capacitance	Rated Voltage	Page
MCHL	NPO	0402,0603	0.5pF~3300pF	16V,25V,50V,100V	12

### High Frequency Capacitors

Type	Dielectric	Size	Capacitance	Rated Voltage	Page
MCHF	NPO	0402,0603	0.1pF~22pF	50V	14

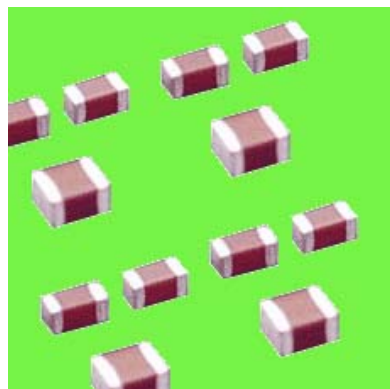
### Low Inductance Capacitors

Type	Dielectric	Size	Capacitance	Rated Voltage	Page
MCLI	NPO	0612	10nF~150nF	50V	17

### Capacitor Arrays

Type	Dielectric	Size	Capacitance	Rated Voltage	Page
CA	NPO	4×0603	10pF~470pF	50V	16
	X7R	4×0603	180pF~0.10uF	16V,50V	16
	Y5V	4×0603	0.010uF~0.10uF	50V	16

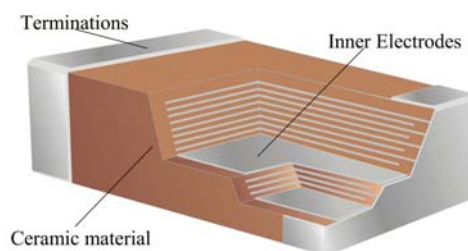
# MULTILAYER CERAMIC CAPACITORS



## Features

- Wide capacitance range, extremely compact size.
- Low inductance of capacitor for high frequency application.
- Excellent solderability and resistance to soldering heat, suitable for flow and reflow soldering.
- Adaptable to high-speed surface mount assembly.
- Conform to EIAJ-RC3402, and also compatible with EIA-RS198 and IEC PUB. 384-10.

## Construction



## Part Numbering

MC	03	J	T	N	250	3R9
①	②	③	④	⑤	⑥	⑦

### ①Product Type

Product Type	
MC	General Capacitors
MC	Ultra-small Capacitors
MC	Middle and High Voltage Capacitors
MCHL	High Q and Low ESR Capacitors
MCHF	High Frequency Capacitors
MCLI	Low Inductance Capacitors
CA	Capacitor Arrays

### ②Dimensions (LxW)

Codes	Dimensions (LxW)	EIA
12	4.5 × 3.2mm	1812
08	4.5 × 2.03mm	1808
10	3.2 × 2.5mm	1210
06	3.2 × 1.6mm	1206
05	2.0 × 1.25mm	0805
03	1.6 × 0.8mm	0603
02	1.0 × 0.5mm	0402
01	0.6 × 0.3mm	0201
43	3.2 × 1.6mm	0612
03	3.2 × 1.6mm	0603×4

### ③Capacitance Tolerance

Codes	Capacitance Tolerance	Capacitance Tolerance		
		NPO	X7R	Y5V
B	±0.1 pF (Cap≤5pF)	v		
C	±0.25 pF (Cap≤5pF)	v		
D	±0.5 pF (5pF<Cap<10pF)	v		
F	±1.0 %	v		
G	±2.0 %	v		
J	±5.0 %	v	v	
K	±10 %	v	v	
M	±20 %		v	v
Z	-20%/+80%			v

\* Storage Temperature :25±3°C ;>80%RH

Termination: Ag/Ni/Sn for NPO dielectric.

Cu/Ni/Sn for X7R, Y5V, X5R and X5S dielectric.

### ④Packaging

Code	Type
T	Taping Reel

### ⑤Dielectric

Code	Dielectric
N	COG(NPO)
B	X7R
F	Y5V
X	X5R
S	X6S

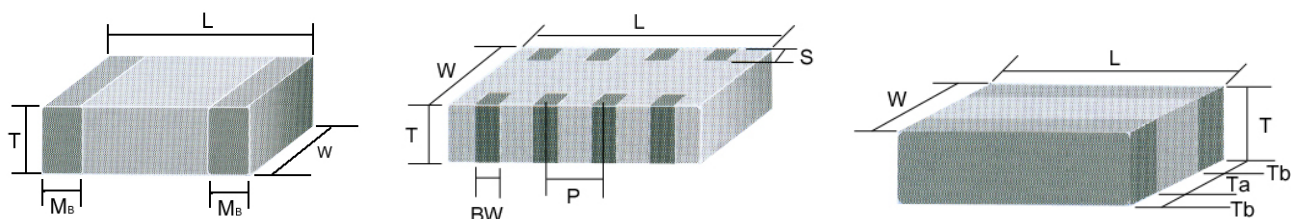
### ⑥Voltage (VDCW)

Code	Voltage
6V3	6.3V
250	25V
500	50V
101	100V
102	1000V
202	2000V
302	3000V

### ⑦Capacitance

Code	Capacitance
3R9	3.9 pF
150	15 pF
181	180 pF
225	2.2 μF
476	47 μF

## Dimensions and Packaging



Single chip capacitors for MC Series , MCHL Series , MCHF Series

SIZE Inch (mm)	L (mm)	W (mm)	T / Symbol (mm)		Mb	Packaging (7" Reel)	
						Paper tape	Plastic tape
0201 (0603)	0.6±0.03	0.3±0.03	0.3±0.03	L	0.15±0.05	15K	
0402 (1005)	1.00±0.05	0.50±0.05	0.50±0.05	N	0.25 +0.05 / -0.10	10K	
0603 (1608)	1.60±0.10	0.80±0.10	0.80±0.07	S	0.40±0.15	4K	
	1.60 +0.15 / -0.10	0.80 +0.15 / -0.10	0.80 +0.05 / -0.10	X		4K	
0805 (2012)	2.00±0.15	1.25±0.10	0.60±0.10	A	0.50±0.20	4K	
			0.80±0.10	B		4K	
			1.25±0.10	D			3K
	2.00±0.20	1.25±0.20	1.25±0.20	I			3K
1206 (3216)	3.20±0.15	1.60±0.15	0.80±0.10	B	0.60±0.20	4K	
			0.95±0.10	C			3K
			1.15±0.15	J			3K
			1.25±0.10	D			3K
	1.60±0.20	G		2K			
	3.20 +0.30 / -0.10	1.60 +0.30 / -0.10	1.60 +0.30 / -0.10	P			2K
1210 (3225)	3.20±0.30	2.50±0.20	0.95±0.10	C	0.75±0.25		3K
			1.25±0.10	D			3K
	3.20±0.40	2.50±0.30	1.60±0.20	G			2K
			2.00±0.20	K			1K
			2.50±0.30	M			1K
1808 (4520)	4.50±0.40	2.03±0.25	1.25±0.10	D	0.50±0.25*		2K
			2.00±0.20	K			1K
1812 (4532)	4.50±0.40	3.20±0.30	1.25±0.10	D	0.75±0.25 0.50±0.25*		1K
			2.00±0.20	K			1K

\* For Middle and High Voltage Capacitors

Capacitor Arrays for CA Series

SIZE Inch (mm)	L (mm)	W (mm)	T / Symbol (mm)		S(mm)	BW(mm)	P(mm)	Packaging (7" Reel)	
								Paper tape	Plastic tape
0612(1632) 4×0603	3.20±0.15	1.60±0.15	0.80±0.10	B	0.30±0.20	0.40±0.15	0.80±0.15	4K	

Low Inductance Capacitors for MCLI Series

SIZE Inch (mm)	L (mm)	W (mm)	T / Symbol (mm)		Ta min. (mm)	Tb min. (mm)	Packaging (7" Reel)	
							Paper tape	Plastic tape
0612(1632)	3.20±0.15	1.60±0.15	0.80±0.10	B	0.5	0.13	4K	

## Ultra-small 0201 Capacitors

### Capacitance & Voltage

DIELECTRIC		NPO	
EIA	Size	0201	
Code	VDCW	16	25
0R5	0.5pF		L
1R0	1.0		L
1R2	1.2		L
1R5	1.5		L
1R8	1.8		L
2R2	2.2		L
2R7	2.7		L
3R3	3.3		L
3R9	3.9		L
4R7	4.7		L
5R6	5.6		L
6R8	6.8		L
8R2	8.2		L
100	10		L
120	12		L
150	15		L
180	18		L
220	22		L
270	27		L
330	33		L
390	39		L
470	47		L
560	56	L	L
680	68	L	L
820	82	L	L
101	100	L	L

DIELECTRIC		X7R				X5R			Y5V	
EIA	Size	0201				0201			0201	
Code	VDCW	10V	16V	25V	50V	6.3V	10V	16V	4V	6.3V
101	100pF		L	L	L			L		
121	120		L	L	L			L		
151	150		L	L	L			L		
181	180		L	L	L			L		
221	220		L	L	L			L		
271	270		L	L	L			L		
331	330		L	L	L			L		
391	390		L	L	L			L		
471	470		L	L	L			L		
561	560		L	L	L			L		
681	680		L	L	L			L		
821	820		L	L	L			L		
102	1000		L	L	L			L		
152	1500	L	L				L	L		
222	2200	L	L				L	L		
332	3300	L	L				L	L		
472	4700	L	L				L	L		
682	6800						L			
103	0.010uF						L			
153	0.015					L				
223	0.022					L				L
333	0.033									
473	0.047									
683	0.068									
104	0.100					L			L	L

The letter in cell is expressed the symbol of product thickness.

### Electrical Data

Size	0201			
	NPO	X7R	X5R	Y5V
Capacitance*	0.5pF~100pF	100pF~4700pF	100pF~0.10uF	0.022uF~0.10uF
Capacitance tolerance	Cap≤5pF: C(±0.25pF) 5pF<Cap<10pF: D(±0.50pF) Cap≥10pF: L(±5%)	J (±5%) K (±10%)	K (±10%) M (±20%)	M (±20%) Z(-20 / +80%)
Rated voltage(WVDC)	16V,25V	10V,16V,25V,50V	6.3V,10V,16V	4V,6.3V
Tan δ/Q*	Cap<30pF: Q≥400 +20C Cap≥30pF: Q≥1000	Ur=50V: ≤3.0% Ur=16V,25V: ≤3.5% Ur=10V: ≤5.0%	Ur=16V: ≤3.5% Ur=10V: ≤5.0% Ur=6.3V: ≤10%	≤20%
Insulation resistance at Ur	≥10GΩ	≥10GΩ or R×C≥500Q×F Whichever is less		
Operating temperature	-55 to +125°C		-55 to +85°C	-25 to +85°C
Capacitance change	±30 ppm	±15%		+30/-80%
Termination	Ni/Sn(lead-free termination)			

\* Measured at 30-70% related humidity.

**NPO:** Apply 1.0±0.2Vrms, 1.0MHz±10% at the condition of 25°C ambient temperature.

**X7R,X5R:** Apply 1.0±0.2Vrms, 1.0kHz±10% at the condition of 25°C ambient temperature.

**Y5V:** Apply 1.0±0.2Vrms, 1.0kHz±10% at the condition of 20°C ambient temperature.