

# 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

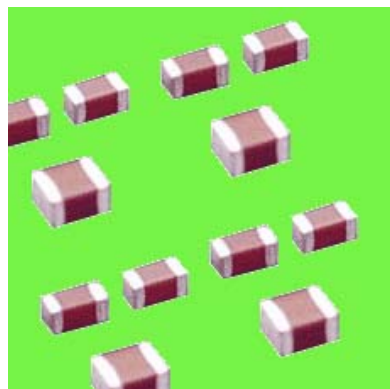
### Low Inductance Capacitors

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

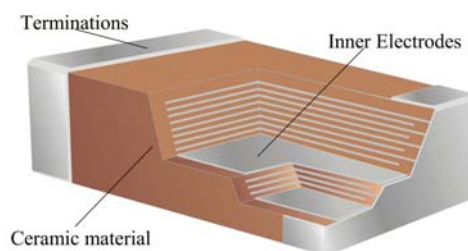
# MULTILAYER CERAMIC CAPACITORS



## 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

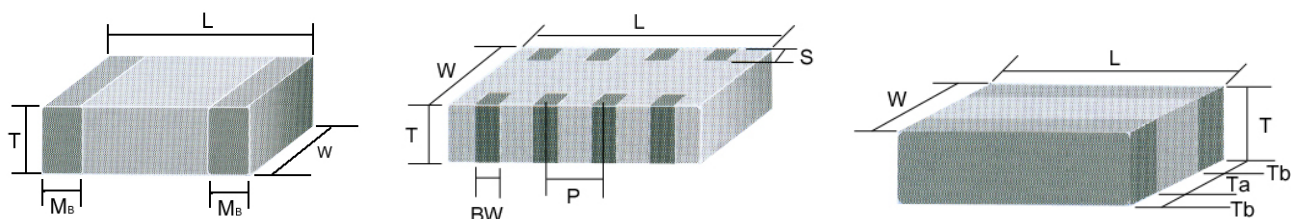
### ⑥Voltage (VDCW)

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	1.60±0.20	1.60±0.20	G		
	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	

## High Frequency Capacitors

### Capacitance & Voltage

DIELECTRIC		NPO	
EIA	Size	0402	0603
Code	VDCW	50V	50V
0R1	0.1pF	N	
0R2	0.2	N	
0R3	0.3	N	
0R4	0.4	N	S
0R5	0.5	N	S
0R6	0.6	N	S
0R7	0.7	N	S
0R8	0.8	N	S
0R9	0.9	N	S
1R0	1.0	N	S
1R2	1.2	N	S
1R5	1.5	N	S
1R8	1.8	N	S
2R0	2.0	N	S
2R2	2.2	N	S
2R7	2.7	N	S
3R0	3.0	N	S
3R3	3.3	N	S
3R9	3.9	N	S
4R0	4.0	N	S
4R7	4.7	N	S
5R0	5.0	N	S
5R6	5.6	N	S
6R0	6.0	N	S
6R8	6.8	N	S
7R0	7.0	N	S
8R0	8.0	N	S
8R2	8.2	N	S
9R0	9.0	N	S
100	10	N	S
120	12		S
150	15		S
180	18		S
220	22		S

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

### Electrical Data

<b>Size</b>	<b>0402 , 0603</b>
<b>Dielectric</b>	<b>NP0</b>
Capacitance*	0402: 0.1pF ~ 10pF 0603: 0.4pF ~ 22pF
Capacitance tolerance**	Cap $\leq$ 5pF : A ( $\pm$ 0.05pF), B( $\pm$ 0.1pF) 5pF<Cap<10pF: B( $\pm$ 0.1pF),C( $\pm$ 0.25pF)
Rated voltage(WVDC)	50V
Q *	Cap<30pF:Q $\geq$ 400 +20 $^{\circ}$ C Cap $\geq$ 30pF: Q $\geq$ 1000
Insulation resistance at Ur	$\geq$ 10G $\Omega$
Operating temperature	-55 to +125 $^{\circ}$ C
Capacitance	$\pm$ 30 ppm
ESR	Cap<2.2pF: $\leq$ 1000m $\Omega$ @900 $\pm$ 100MHz 2.2pF $\leq$ Cap $\leq$ 470pF: $\leq$ 500m $\Omega$ @900 $\pm$ 100MHz
Termination	Ni/Sn(lead-free termination)

\* Measured at the conditions of 25 $^{\circ}$ C ambient temperature and 30-70% related humidity.

Apply 1.0 $\pm$ 0.2Vrms, 1.0MHz $\pm$ 10% for Cap $\leq$ 1000pF, 1.0kHz $\pm$ 10% for Cap>1000pF.

### Electrical characteristics

