

# MULTILAYER CERAMIC CAPACITORS

## Capacitor Arrays Series



### 1. INTRODUCTION

WTC middle and high voltage series MLCC is designed by a special internal electrode pattern, which can reduce voltage concentrations by distributing voltage gradients throughout the entire capacitor. This special design also affords increased capacitance values in a given case size and voltage rating.

WTC capacitor arrays are developed to offer designers the opportunity to lower placement costs increase assembly line output through lower component count per board.

### 2. FEATURES

- High density mounting due to mounting space saving.
- Mounting cost saving.
- Increased throughput.

### 3. APPLICATIONS

- For use as a bypass for digital and analog signal line noise
- Computer motherboards and peripherals.
- The other common electronic circuits.

### 4. HOW TO ORDER

<u>Y</u>	<u>4C</u>	<u>3</u>	<u>B</u>	<u>103</u>	<u>K</u>	<u>500</u>	<u>C</u>	<u>I</u>
<u>Series</u>	<u>Cap. Nr.</u>	<u>Termination pitch</u>	<u>Dielectric</u>	<u>Capacitance</u>	<u>Tolerance</u>	<u>Rated voltage</u>	<u>Termination</u>	<u>Packaging</u>
Y=Capacitor array	4C=4xCap	3=0.03" pitch	N=NP0 (C0G) B=X7R F=Y5V	Two significant digits followed by no. of zeros. And R is in place of decimal point.  eg.: 103=10x10 <sup>3</sup> =10,000pF =10nF	J=±5% K=±10% M=±20% Z=-20/+80%	Two significant digits followed by no. of zeros. And R is in place of decimal point.  eg.: 160=16 VDC 250=25 VDC 500=50 VDC	L=Ag/Ni/Sn (for NP0 dielectric) C=Cu/Ni/Sn (for X7R, Y5V dielectric)	T=7" reeled G=13" reeled

# MULTILAYER CERAMIC CAPACITORS

## Capacitor Arrays Series



### 5. EXTERNAL DIMENSIONS

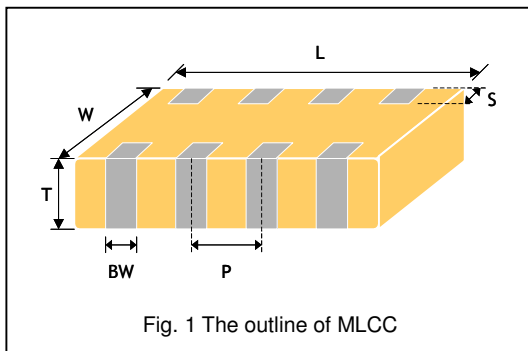


Fig. 1 The outline of MLCC

Size Inch (mm)	L (mm)	W (mm)	T (mm)/Symbol	S (mm)	BW (mm)	P (mm)
0612 (1632)	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

### 6. GENERAL ELECTRICAL DATA

Size	4 x 0603		
Dielectric	NP0	X7R	Y5V
Capacitance*	10pF to 470pF	180pF to 100nF	10nF to 100nF
Capacitance tolerance	J (±5%), K (±10%)	K (±10%), M (±20%)	Z (-20/+80%)
Rated voltage (WVDC)	50V	16V, 50V	50V
Q/Tan δ*	Cap<30pF: Q≥400+20C Cap≥30pF: Q≥1000	Ur=50V, ≤2.5% Ur=16V, ≤3.5%	≤5%
Insulation resistance at Ur	≥10GΩ	≥10GΩ or RxC≥500ΩxF whichever is less	
Operating temperature	-55 to +125°C		-25 to +85°C
Capacitance characteristic	±30ppm	±15%	+30/-80%
Termination	Ni/Sn (lead-free termination)		

\* Measured at 30~70% related humidity.

NP0: Apply 1.0±0.2Vrms, 1.0MHz±10% at the conditions of 25°C ambient temperature.

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

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

# MULTILAYER CERAMIC CAPACITORS

Capacitor Arrays Series



## 7. CAPACITANCE RANGE

SIZE		4 x 0603						
DIELECTRIC		NP0		X7R			Y5V	
RATED VOLTAGE (VDC)		25	50	16	25	50	25	50
Capacitance	10pF (100)	B	B					
	15pF (150)	B	B					
	22pF (220)	B	B					
	33pF (330)	B	B					
	47pF (470)	B	B					
	68pF (680)	B	B					
	100pF (101)	B	B					
	150pF (151)	B	B					
	180pF (181)	B	B		B	B		
	220pF (221)	B	B		B	B		
	330pF (331)	B	B		B	B		
	470pF (471)	B	B		B	B		
	680pF (681)				B	B		
	1,000pF (102)				B	B		
	1,500pF (152)				B	B		
	2,200pF (222)				B	B		
	3,300pF (332)				B	B		
	4,700pF (472)				B	B		
	6,800pF (682)				B	B		
	0.010μF (103)				B	B	B	B
0.015μF (153)			B			B	B	
0.022μF (223)			B			B	B	
0.033μF (333)			B			B	B	
0.047μF (473)			B			B	B	
0.068μF (683)			B			B	B	
0.10μF (104)			B			B	B	

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

## 8. PACKAGING DIMENSION AND QUANTITY

Size	Thickness/Symbol (mm)		Paper tape	
			7" reel	13" reel
4 x 0603	0.80±0.10	B	4k	15k

Unit: pieces

# MULTILAYER CERAMIC CAPACITORS

## Capacitor Arrays Series



### APPENDIXES

#### ▣ Constructions

No.	Name	NP0	X7R, Y5V
①	Ceramic material	BaTiO <sub>3</sub> based	
②	Inner electrode	AgPd alloy	Ni
③	Termination	Inner layer	Ag
④		Middle layer	Ni
⑤		Outer layer	Sn

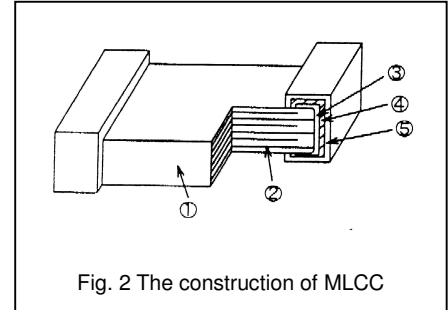


Fig. 2 The construction of MLCC

#### ▣ Storage and handling conditions

- (1) To store products at 5 to 40°C ambient temperature and 20 to 70% related humidity conditions.
- (2) The product is recommended to be used within one year after shipment. Check solderability in case of shelf life extension is needed.

Cautions:

- a. Don't store products in a corrosive environment such as sulfide, chloride gas, or acid. It may cause oxidization of electrode, which easily be resulted in poor soldering.
- b. To store products on the shelf and avoid exposure to moisture.
- c. Don't expose products to excessive shock, vibration, direct sunlight and so on.

#### ▣ Recommended soldering conditions

The lead-free termination MLCCs are not only to be used on SMT against lead-free solder paste, but also suitable against lead-containing solder paste. If the optimized solder joint is requested, increasing soldering time, temperature and concentration of N<sub>2</sub> within oven are recommended.

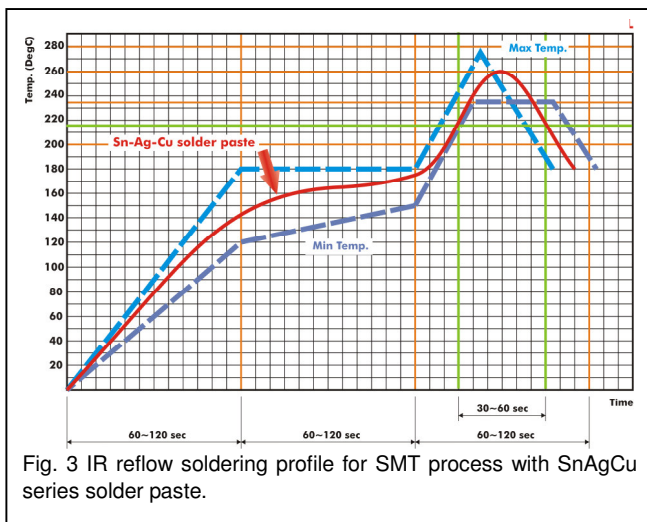


Fig. 3 IR reflow soldering profile for SMT process with SnAgCu series solder paste.

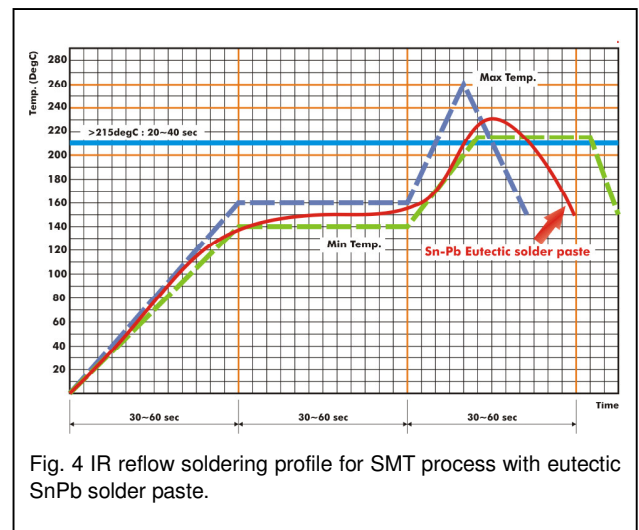


Fig. 4 IR reflow soldering profile for SMT process with eutectic SnPb solder paste.