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

a. High density mounting due to mounting space saving.
b. Mounting cost saving.
c. Increased throughput.

3. APPLICATIONS

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

4. HOW TO ORDER

Y	4C	3	B	103	K	500	C	T
Series	**Cap. Nr.**	**Termination pitch**	**Dielectric**	**Capacitance**	**Tolerance**	**Rated voltage**	**Termination**	**Packaging**
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=10x10^3 =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

5. EXTERNAL DIMENSIONS

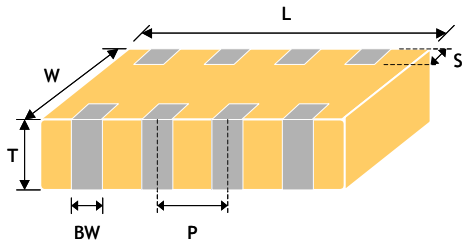


Fig. 1 The outline of MLCC

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)	25, 50V	16V, 25V, 50V	25V, 50V
Q/Tan δ*	Cap<30pF: Q≥400+20C Cap≥30pF: Q≥1000	Ur=25V & 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.

** Preconditioning for Class II MLCC: Perform a heat treatment at 150±10°C for 1 hour, then leave in ambient condition for 24±2 hours before measurement.

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		
	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	B	B
	0.022μF (223)			B	B	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

9. APPENDIXES

◙ Tape & reel dimensions

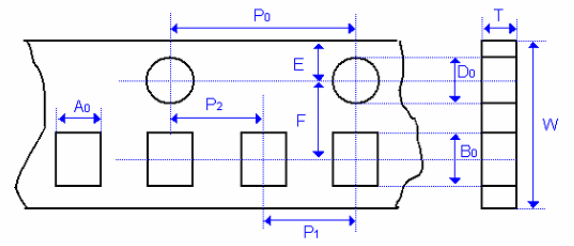


Fig. 2 The dimension of paper tape

Size	4x0603
Thickness	B
A_0	2.00±0.10
B_0	3.50±0.10
T	0.95±0.05
K_0	-
W	8.00±0.10
P_0	4.00±0.10
$10xP_0$	40.0±0.10
P_1	4.00±0.10
P_2	2.00±0.05
D_0	1.50±0.05
D_1	-
E	1.75±0.10
F	3.50±0.05

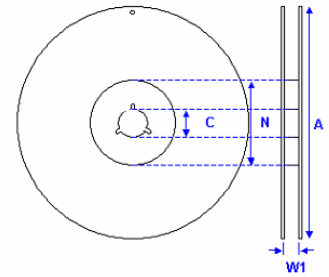
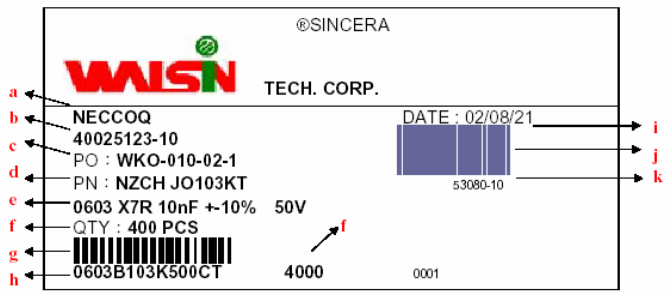


Fig. 3 The dimension of reel

Size	4x0603
Reel size	7”
C	13.0+0.5/-0.2
W_1	8.4+1.5/-0
A	178.0±0.10
N	60.5±1.0

◙ Description of customer label



a. Customer name
b. WTC order series and item number
c. Customer P/O
d. Customer P/N
e. Description of product
f. Quantity
g. Bar code including quantity & WTC P/N or customer
h. WTC P/N
i. Shipping date
j. Order bar code including series and item numbers
k. Serial number of label

◙ Constructions

No.	Name		NP0	X7R, Y5V
①	Ceramic material		$BaTiO_3$ based	
②	Inner electrode		AgPd alloy	Ni
③	Termination	Inner layer	Ag	Cu
④		Middle layer	Ni	
⑤		Outer layer	Sn (Matt)	

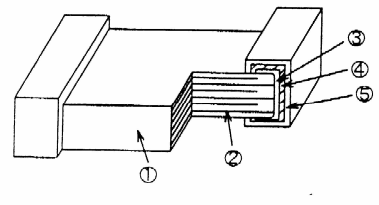


Fig. 4 The construction of MLCC

◙ 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_2 within oven are recommended.

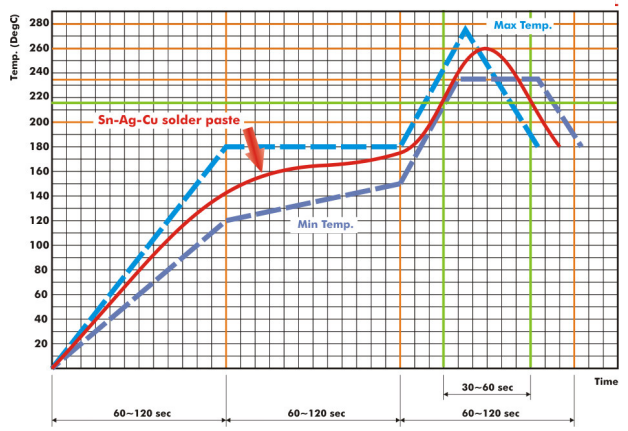


Fig. 5 IR reflow soldering profile for SMT process with SnAgCu series solder paste.

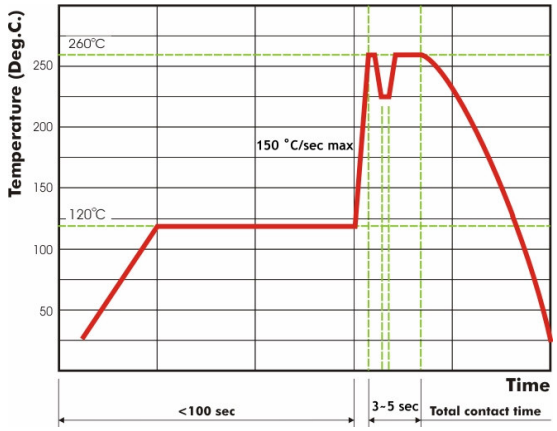


Fig. 6 Recommended wave soldering profile for SMT process with SnAgCu series solder.