

# MULTILAYER CERAMIC CAPACITORS

## Low Profile Series (TT)



### 1. DESCRIPTION

MLCC consists of a conducting material and electrodes. To manufacture a chip-type SMT and achieve miniaturization, high density and high efficiency, ceramic condensers are used.

WTC TT series MLCC is used in product having thickness concerned generally have high capacitance and thinner product thickness. The high dielectric constant material X7R, X5R and Y5V are used for this series product.

### 2. FEATURES

- a. Standard size with thin thickness.
- b. Small size with high capacitance.
- c. Capacitor with lead-free termination (pure Tin).

### 3. APPLICATIONS

- a. For LCD panels.
- b. For PCMCIA cards.
- c. For IC packaging and modules.
- d. Any thickness concerned products.

### 4. HOW TO ORDER

<u>TT</u>	<u>31</u>	<u>X</u>	<u>225</u>	<u>M</u>	<u>100</u>	<u>C</u>	<u>I</u>
<u>Series</u>	<u>Size</u>	<u>Dielectric</u>	<u>Capacitance</u>	<u>Tolerance</u>	<u>Rated voltage</u>	<u>Termination</u>	<u>Packaging style</u>
TT=Low profile	21=0805 (2012) 31=1206 (3216) 32=1210 (3225)	X=X5R F=Y5V	Two significant digits followed by no. of zeros. And R is in place of decimal point.  eg.: 225=22x10 <sup>5</sup> =2,200,000pF =2.2μF	K=±10% M=±20% Z=-20/+80%	Two significant digits followed by no. of zeros. And R is in place of decimal point.  6R3=6.3 VDC 100=10 VDC 160=16 VDC	C=Cu/Ni/Sn	T=7" reeled

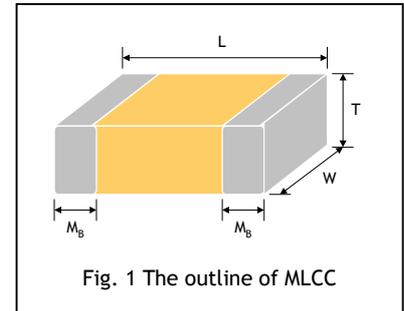
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### 5. EXTERNAL DIMENSIONS

Size Inch (mm)	L (mm)	W (mm)	Tmax (mm)/Symbol		M <sub>B</sub> (mm)
0805 (2012)	2.00±0.15	1.25±0.20	0.95	T	0.50±0.20
1206 (3216)	3.20±0.15	1.60±0.15	0.95	T	0.60±0.20
	3.20±0.20	1.60±0.20	1.25	J	
1210 (3225)	3.20±0.30	2.50±0.20	0.95	T	0.75±0.25



\* Reflow soldering process only is recommended.

### 6. GENERAL ELECTRICAL DATA

Dielectric	X5R	Y5V
Size	0805, 1206, 1210	
Capacitance range*	1.0μF to 4.7μF	2.2μF to 10μF
Capacitance tolerance	K (±10%), M (±20%)	Z (-20/+80%)
Rated voltage (WVDC)	6.3V, 10V	10V, 16V
Tan δ*	10V: ≤5.0% 6.3V: ≤7.5%	16V: 9.0% 10V: 12.5%
Insulation resistance at Ur	RxC≥500ΩxF	
Operating temperature	-55 to +85°C	-25 to +85°C
Capacitance characteristic	±15%	+30/-80%
Termination	Ni/Sn (lead-free termination)	

\* Measured at 1.0±0.2Vrms, 1.0kHz±10%, 30-70% related humidity, 25°C ambient temperature for X7R, X5R and at 20°C for Y5V.

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### 7. CAPACITANCE RANGE

Dielectric	Size	Capacitance	Tolerance	Rated Voltage (VDC)	Thickness Max (mm)	Part Number
X5R	0805	1.0 $\mu$ F	$\pm 10\%$ , $\pm 20\%$	10	0.95	TT21X105□100CT
	1206	2.2 $\mu$ F	$\pm 10\%$ , $\pm 20\%$	10	0.95	TT31X225□100CT
	1210	3.3 $\mu$ F	$\pm 10\%$ , $\pm 20\%$	10	0.95	TT32X335□100CT
		4.7 $\mu$ F	$\pm 10\%$ , $\pm 20\%$	10	0.95	TT32X475□100CT
Y5V	0805	2.2 $\mu$ F	-20/+80%	16	0.95	TT21F225Z160CT
		3.3 $\mu$ F	-20/+80%	10	0.95	TT21F335Z100CT
		4.7 $\mu$ F	-20/+80%	10	0.95	TT21F475Z100CT
	1206	4.7 $\mu$ F	-20/+80%	10	0.95	TT31F475Z100CT
		4.7 $\mu$ F	-20/+80%	16	0.95	TT31F475Z160CT
		10 $\mu$ F	-20/+80%	10	0.95	TT31F106Z100CT
		10 $\mu$ F	-20/+80%	16	1.25	TT31F106Z160CT

Please specify the capacitance tolerance code.

1. This series product is suited to reflow soldering process only.
2. For more information about products with special capacitance or other data, please contact WTC local representative.

### 8. PACKAGING STYLE AND QUANTITY

Size	Thickness Max (mm)/Symbol		7" reel	
			Paper tape	Plastic tape
0805 (2012)	0.95	T	4k	-
1206 (3216)	0.95	T	4k	-
	1.25	J	-	3k
1210 (3225)	0.95	T	-	3k

Unit: pieces

### APPENDIXES

#### ▣ Constructions

No.	Name	X5R, Y5V	
①	Ceramic material	BaTiO <sub>3</sub> based	
②	Inner electrode	Ni	
③	Termination	Inner layer	Cu
④		Middle layer	Ni
⑤		Outer layer	Sn

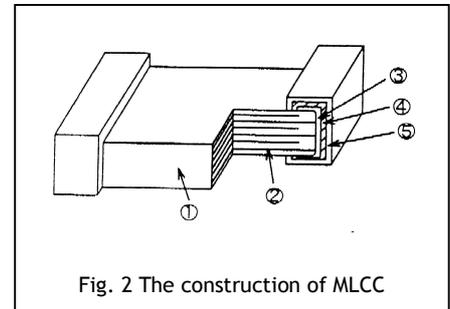


Fig. 2 The construction of MLCC

#### ▣ 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.

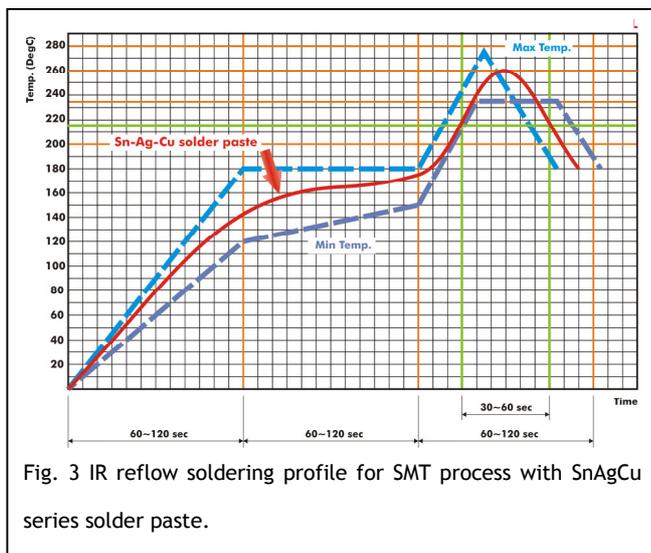


Fig. 3 IR reflow soldering profile for SMT process with SnAgCu series solder paste.

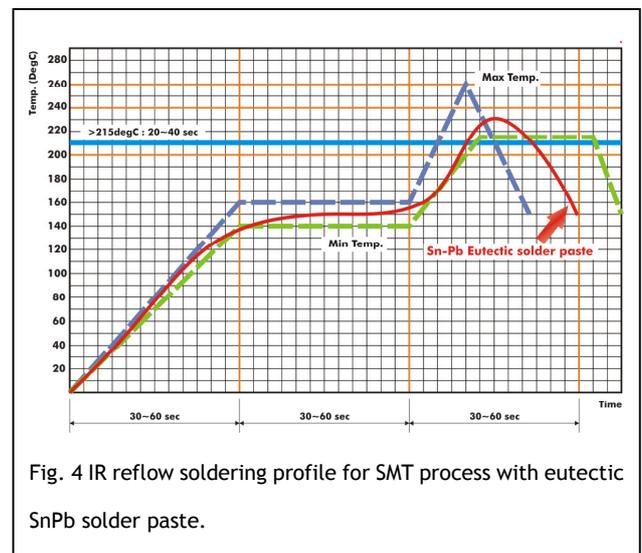


Fig. 4 IR reflow soldering profile for SMT process with eutectic SnPb solder paste.