# multicomp

# RoHS Compliant



# **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.

# Features:

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

# **Applications:**

- For LCD panels.
- For PCMCA cards.
- For IC packaging and modules.
- Any thickness concerned products.

# How To Order:

MCTT	31	Х	225	К	100	С	Т
<u>Series</u>	Size	<b>Dielectric</b>	<u>Capacitance</u>	<u>Tolerance</u>	Rated Voltage	<b>Termination</b>	Packaging style
Multicomp TT = Low profile	15=0402 (1005) 18=0603 (1608) 21=0805 (2012) 31=1206 (3216) 32=1210 (3225)	B=X7R X=X5R F=Y5V	Two significant digits followed by no. of zeros. And R is in place of decimal point. Eg.: $225 = 22 \times 10^5$ = 2,200,000 pF $= 2.2 \mu \text{F}$	K=±10% M=±20% Z=-20/+80%	Two significant digits followed by no. of zeros. And R is in place of decimal point. 6R3=6.3V DC 100=10V DC 160=16V DC 250=25V DC 500=50V DC	C=Cu/Ni/Sn	T=7" reel (paper tape) P=7" reel (plastic tape)

# **External Dimensions:**



Size Inch (mm)	L (mm)	W (mm)	T max (mm)/Symbol		M <sub>B</sub> (mm)
0402 (1005)	1 ±0.05	0.5 ±0.05	0.33	L	0.25 ±0.1
0603 (1608)	1.6+0.15/-0.1	0.8+0.15/-0.1	0.6	н	0.4 ±0.15
0805 (2012)	2 ±0.2	1.25 ±0.2	0.95	Т	0.5 ±0.2
1206 (3216)	3.2 ±0.2	1.6 ±0.2	0.95	Т	0.6 ±0.2
1200 (3210)	3.2 ±0.2	1.0 ±0.2	1.3	J	0.0 ±0.2
1210 (3225)	3.2 ±0.3	2.5 ±0.2	0.95	Т	0.75 ±0.25

# Reflow soldering process only is recommended





# **General Electrical Data:**

Dielectric	X7R	X5R	Y5V		
Size		0402, 0603, 0805, 1206, 1210			
Capacitance range*	1μF to 10μF	0.22µF to 22µF	1μF to 10μF		
Capacitance tolerance**	K (±10%	Z (-20/+80%)			
Rated voltage (WVDC)	10V, 16V, 25V, 50V	6.3V, 10V, 16V, 25V	10V, 16V, 25V, 50V		
Operating temperature	-55 to +125°C	-55 to +85°C	-25 to +85°C		
Capacitance characteristic	±	+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.

\*\* 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.

### Packaging Dimension And Quantity:

Sino	Thickness Mo	(mm)/Symphol	7"	reel
Size	Thickness was	k (mm)/Symbol	Paper tape	Plastic tape
0402 (1005)	0.33	L	15k	-
0603 (1608)	0.60	Н	4k	-
0805 (2012)	0.95	Т	4k	-
1206 (2216)	0.95	Т	4k	-
1206 (3216)	1.30	J	-	3k
1210 (3225)	0.95	Т	-	3k

Unit : pieces

# **Reliability Test Conditions and Requirements:**

No	ltem	Test Condition		Requiremen	nts
1	Visual and Mechanical	-	No remarkable defect Dimensions to conFor		al specification sheet.
2	Capacitance		Shall not exceed the I	imits given in	the detailed spec.
			X7R/X5R:		
			Rated vol.	D.F.	
		Cap≤10µF, 1.0±0.2Vrms, 1kHz±10%	50V, 25V, 16V, 10V	≤10%	
	Q/ D.F.	Cap>10µF, 0.5±0.2Vrms, 120Hz±20%**	6.3V	≤15%	
3	(Dissipation	** Test condition: 0.5±0.2Vrms, 1KHz±10%	Y5V:		
	Factor)	TT18X≧475(10V) , TT15X series	Rated vol.	D.F.	
			50V	≤7%	
			25V	≤9%	
			16V/10V	≤12.5%	





No	ltem	Test Condition	Requirements		
4	Dielectric Strength	To apply voltage: 250% rated voltage. Duration: 1 to 5 sec. Charge and discharge current less than 50mA.	No evidence of damage or flash over during test.		
5	Insulation Resistance	To apply rated voltage for max. 120sec.	≥10G $\Omega$ or RxC≥100 $\Omega$ -F whichever is smaller.		
6	Temperature Coefficient	With no electrical load.T.C.Operating TempNP055~125°C at 25°CX7R55~125°C at 25°CY5V25~85°C at 20°C	T.C.Capacitance ChangeX7RWithin ±15%X5RWithin ±15%Y5VWithin +30%/-80%		
7.	Adhesive Strength of Termination	Pressurizing force: 5N (≤0603) and 10N (>0603) Test time: 10±1 sec.	No remarkable damage or removal of the terminations.		
8	Vibration Resistance	Vibration frequency: 10~55 Hz/min. Total amplitude: 1.5mm Test time: 6 hrs. (Two hrs each in three mutually perpendicular directions.) Measurement to be made after keeping at room temp. for 24±2 hrs.	No remarkable damage. Cap change and Q/D.F.: To meet initial spec.		
9	Solderability	Solder temperature: 235±5°C Dipping time: 2±0.5 sec.	95% min. coverage of all metalized area		
10	Bending Test	The middle part of substrate shall be pressurized by means of the pressur- izing rod at a rate of about 1mm per second until the deflection becomes : 5mm and then the pressure shall be maintained for $5\pm1$ sec. Measurement to be made after keeping at room temp. for $24\pm2$ hrs.	No remarkable damage. Cap change: X7R/X5R: within ±12.5% Y5V: within ±30% (This capacitance change means the change of capacitance under specified flexure of substrate from the capacitance measured before the test.)		
11	Resistance to Soldering Heat	Solder temperature: 260±5°C Dipping time: 10±1 sec Preheating: 120 to 150°C for 1 min- ute before immerse the capacitor in a eutectic solder. Before initial measurement (Class II only): Perform 150+0/-10°C for 1 hr and then set for 24±2 hrs at room temp. Measurement to be made after keeping at room temp. for 24±2 hrs.	No remarkable damage. Cap change: X7R/X5R: within ±7.5% Y5V: within ±20% Q/D.F., I.R. and dielectric strength: To meet initial requirements. 25% max. leaching on each edge.		



#### Low Profile Multilayer SMD Ceramic Capacitor 0402 to 1210 Sizes, X7R, X5R & Y5V Dielectrics (MCTT Series)



12     Conduct the five cycles according to the temperatures and time.     Step Temper(C) Time (min).       11     Min. operating temp. +0/-3 30t3     30t3       12     Room temp.     2-3       13     Max. operating temp. +3/-0 30t3     YTR/XSR; within ±20%       2     Room temp.     2-3       3     Max. operating temp. +3/-0 30t3     YTR/XSR; within ±20%       2     Perform 159/40-10°C for 1 h rand then set for 24±2 hrs.     No remarkable damage.       2     Test temp: :40±2°C     Humidity     No remarkable damage.       13     Humidity     Test temp: :40±2°C     Humidity: 90-95% RH     Test temp: :40±2°C       Humidity     190-924/-0hrs.     Before initial measurement (Class II only): Perform 150+0/-10°C for 1 h rand tom temp. for 24±2 hrs.     No remarkable damage.       10     220%     S0V, 6.3V     ≤30%       100     520%     100     50V, 6.3V       100     520%     100     50V, 6.3V       110     520%     100     50V, 6.3V       111     1120 or RXCE10 D_F Withekeer is smaller.     No remarkable damage.       1120 or RXCE10 D_F Withekeer is smaller.	No	ltem	Test Condition					Requireme	nts
12 Temperature Cycle Imm, operating temp, +0/-3 (303) 2 No remarkable damage. Cap change: TRXSR: within ±7.5% YRXSR: within ±20% QD.F., I.R. and dielectric strength: To meet initial regularement to be made after keeping at room temp. for 24±2 hrs.   13 Humidity (Damp Heat) Steady State Test temp:: 40±2°C Humidity: 90-95% RH Test temp::						ig to			
12   Temperature Cycle   1 1 Mill operang temp. 13/3 3 Max operang temp. 13/3 3 Max operang temp. 13/3 4 Room temp.   Cap change: TXPXSR: within ±7.5% YRXSR: within ±20% QD.F., I.R. and dielectric strength: To meet initial requirements.     13   Before initial measurement (Class II only): Perform 150-01-10° C for 1 h rand then ade after keeping at room temp. for 24±2 hrs.   No remarkable damage. Cap change: XTR/XSR: within ±25% YSV: within ±30%; 6.3V, within +30/-40% Q/D.F. value: XTR/XSR:     13   Test temp.: 40±2°C Humidity: Damp Heat Steady State   Test temp.: 40±2°C for 1 h rand then then set for 24±2 hrs.   No remarkable damage. Cap change: XTR/XSR: within ±30%; 6.3V, within +30/-40% Q/D.F. value: XTR/XSR:     14   Test temp.: 40±2°C Humidity: 90-95% RH Test time: 500+24/-0 hrs. Steady State   Test temp.: 40±2°C Humidity: 80-95% RH Test time: 500+24/-0 hrs. To opply obtage: rated voltage for com temp. for 24±2 hrs.   No remarkable damage. Cap change: XTR/XSR: within ±25% YSV:     14   Test temp.: 40±2°C Humidity: 90-95% RH Test time: 500+24/-0 hrs. To apply obtage: rated voltage for initial measurement (Class II only): To apply test voltage for 1hr at Uoad   No remarkable damage. Cap change: XTR/XSR: within ±25% YSV: within ±30%; 6.3V, within +30/-40% Q/D.F. value: XTR/XSR:     14   Humidity (Damp Heat Load   Test temp.: 40±2°C Humidity: 90-95% RH Test time: 500+24/-0 hrs. To apply test voltage for 1hr at Uoad   D.F. Six 16V   Six 16V Six 15% Six 16V   D.F. Six 16V     14   Humidity: (Damp Heat Load   Test temp.: 40±2°C Humidity: 90-95% RH Tes				I Sten Temp (°C)					
12 Temperature Cycle 2 Room temp. 2-3 3 X7R/XSR <sup>2</sup> within ±2.7% YSV within ±2.0% QD, F, I.R. and dielectric strength: To meet initial requirements.   13 Before initial measurement (Class II only): Perform 159/0 <sup>4</sup> /10 <sup>4</sup> for 1 hr and then set for 24±2 hrs. No remarkable damage. Cap change: X7R/XSR <sup>2</sup> within ±2.5% YSV within ±30%, 6.3V, within +30/-40% QD, F, I.R. and dielectric strength: To meet initial requirements.   14 Humidity (Damp Heat) Load Test temp:: 40±2°C Humidity: 90-95% RH Test time: 500+24±0 hrs. Before initial measurement (Class II only): Perform 150+0/-10°C for 1 h r and then set for 24±2 hrs. No remarkable damage. Cap change: X7R/XSR <sup>2</sup> Within ±30%, 6.3V, within +30/-40% QD.F, value: X7R/XSR <sup>2</sup> 14 Humidity (Damp Heat) Load Test temp:: 40±2°C Humidity: 90-95% RH Test time: 500+24±0 hrs. Test temp: for 24±2 hrs. No remarkable damage. Cap change: X7R/XSR <sup>2</sup> 14 Humidity (Damp Heat) Load Test temp:: 40±2°C Humidity: 90-95% RH Test temp:: 40±2°C Humidity: 90-9			1	1	Min. operating temp. +0/-3	30±3		ge.	
13 Max. operating temp. +3/-0_30±3 YoV: within ±20%   YoV: Within ±20% YoV: Within ±20%   Before initial measurement (Class II only): Perform 150+01-0°C for 1 hr and then set for 24±2 hrs at room temp. Measurement to be made after keeping at room temp. for 24±2 hrs. No remarkable damage. Cap change: XTR/XSR: within ±25% YSV: within ±30%; 6.3V, within +30/-40%   13 Humidity: (Damp Heat) Steady State Test temp: 40±2°C Humidity: 90-95% RH Test temp: 507 24±2 hrs. No remarkable damage. Cap change: XTR/XSR: within ±30%; 6.3V, within +30/-40%   14 Humidity: (Damp Heat) Load Test temp: 40±2°C Humidity: 90-95% RH Test temp: for 24±2 hrs. No remarkable damage. Cap change: XTR/XSR: within ±30%; 6.3V, within +30/-40%   14 Humidity: (Damp Heat) Load Test temp: 40±2°C Humidity: 90-95% RH Test temp: 607 24±2 hrs. No remarkable damage. Cap change: XTR/XSR: within ±25% Y5V: within ±30%; 6.3V, within +30/-40%   14 Humidity: (Damp Heat) Load Test temp: 40±2°C Humidity: 90-95% RH Test temp: 40±2°C Humidity: 90-95% RH Test temp: 607 24±2 hrs. No remarkable damage. Cap change: XTR/XSR: within ±25% Y5V: within ±30%; 6.3V, within +30/-40% Q/D.F. value: XTR/XSR:   14 Humidity: (Damp Heat) Load Test temp: 40±2°C Humidity: 90-95% RH Test	12	Temperature	2	2	Room temp.	2~3		5%	
13   Humidity (Damp Heat) Load   Test temp: 40±2°C Humidity: 90-95% RH Test time: 500+24±0 hrs.   No remarkable damage. Cap change: XTR/XSR: within ±25% Y5V: within ±30%; 6.3V, within +30/-40% Q/D.F. value: XTR/XSR:     13   Humidity (Damp Heat) Steady State   Test temp: 40±2°C Humidity: 90-95% RH Test time: 500+24±0 hrs.   No remarkable damage. Cap change: XTR/XSR: within ±25% Y5V: within ±30%; 6.3V, within +30/-40% Q/D.F. value: XTR/XSR:     14   Humidity: (Damp Heat) Load   Test temp: 40±2°C Humidity: 90-95% RH Test time: 500+24±0 hrs.   No remarkable damage. Cap change: XTR/XSR: within ±30%; 6.3V, within +30/-40% Q/D.F. value: XTR/XSR:     14   Humidity: (Damp Heat) Load   Test temp: 40±2°C Humidity: 90-95% RH Test time: 500+24±0 hrs.   No remarkable damage. Cap change: XTR/XSR: within ±25% Y5V: within ±30%; 6.3V, within +30/-40% Q/D.F. value: XTR/XSR:     14   Humidity: (Damp Heat) Load   Test temp: 40±2°C Humidity: 90-95% RH Test time: 500+24±0 hrs.   No remarkable damage. Cap change: XTR/XSR: within ±25% Y5V: within ±30%; 6.3V, within +30/-40% Q/D.F. value: XTR/XSR:     14   Humidity: (Damp Heat) Load   Test temp: 40±2°C Humidity: 90-95% RH Test time: 500+24±0 hrs. To apply voltage : rated voltage Backer on initial measurement (Class II only): To apply test voltage for fln at 40°C and then set for 24±2 hrs at room temp.   No remarkable damage. Cap change: XTR/XSR: within ±25% Y5V: within ±30%; 6.3V, within +30/-40% Q/D.F. value: XTR/XSR:     Rated vol.   D.F. 50V   SV itoV   SV: SV: vitoV     Rated	12	Cycle	3	3	Max. operating temp. +3/-0	30±3			<b>T</b>
Before initial measurement (Class II only): Perform 150+0/10°C for 1 h and then set for 24±2 hrs at room temp. Measurement to be made after keeping at room temp. for 24±2 hrs. No remarkable damage. Cap change: X7R/X5R: within ±25% Y5V: within ±30%; 6.3V, within +30/-40% Q/D.F. value: X7R/X5R:   13 Humidity (Damp Heat) Steady State Test temp:: 40±2°C Humidity: 90-95% RH Test time: 500+24/-0hrs. Before initial measurement (Class II only): Perform 150+0/-10°C for 1 h rand then set for 24±2 hrs. Rated vol. D.F. 25V. 16V   14 Humidity (Damp Heat) Load Test temp:: 40±2°C Humidity: 90-95% RH Test temp: 40±2°C Humidity: 90-95% RH Test temp: 60:24±2 hrs. No remarkable damage. Cap change: X7R/X5R: No remarkable damage.   14 Humidity (Damp Heat) Load Test temp:: 40±2°C Humidity: 90-95% RH Test temp:: 40±2°			4	1	Room temp.	2~3		ctric strength:	To meet initial
Image: 13Humidity (Damp Heat) Steady StateTest temp:: $40\pm2^{\circ}C$ Humidity: $90-95\%$ RH Test time: $500+24/-0hrs$ . Before initial measurement (Class II and then set for $24\pm2$ hrs at room temp. Measurement to be made after keeping at room temp. for $24\pm2$ hrs.Cap change: X7R/XSR: within $\pm 30\%$ ; $6.3V$ , within $\pm 30/-40\%$ Q/D.F. value: X7R/XSR:13Humidity (Damp Heat) Steady StateTest temp:: $40\pm2^{\circ}C$ Humidity: $90-95\%$ RH Test time: $500+24/-0$ hrs.Rated vol.D.F. $25V$ .14Humidity (Damp Heat) LoadTest temp:: $40\pm2^{\circ}C$ Humidity: $90-95\%$ RH Test time: $500+24/-0$ hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage is rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at $40^{\circ}C$ and then set for $24\pm2$ hrs.No remarkanki damage. Cap change: X7R/XSR: within $\pm 30/-40\%$ $Y5V:$ 14Humidity (Damp Heat) LoadTest temp:: $40\pm2^{\circ}C$ Humidity: $90-95\%$ RH Test time: $500+24/-0$ hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at $40^{\circ}C$ and then set for $24\pm2$ hrs at room temp. Measurement to be made after keeping at room temp. for $24\pm2$ hrs.D.F. $25V$ $16V - 10\%$ $16V, 10V - 20\%$ 14Humidity (Damp Heat) LoadMeasurement to be made after keeping at room temp. for $24\pm2$ hrs.D.F. $16V, 10V - 20\%$ 14Humidity (Damp Heat) LoadMeasurement to be made after keeping at room temp. for $24\pm2$ hrs.D.F. $16V, 10V - 20\%$ 14Humidity (Damp Heat) LoadD.F. $100\%$ D.F. <b< td=""><td></td><td></td><td>Perf for 2 Mea</td><td>form 24±2 asur</td><td>150+0/-10°C for 1 hr and th 2 hrs at room temp. ement to be made after keep</td><td>en set</td><td></td><td></td><td></td></b<>			Perf for 2 Mea	form 24±2 asur	150+0/-10°C for 1 hr and th 2 hrs at room temp. ement to be made after keep	en set			
Humidity (Damp Heat) Steady StateHumidity: $90-95\%$ RH Test time: $500+24t-0hrs$ . Before initial measurement (Class II only): Perform $150+0/-10^{\circ}C$ for 1 hr and then set for $24\pm 2$ hrs at room temp Measurement to be made after keeping at room temp. for $24\pm 2$ hrs. $25V, 16V$ $50V, 6.3V$ Rated vol.D.F. $50V$ $50V \leq 10\%$ Ide transformHumidity (Damp Heat) LoadTest temp:: $40\pm 2^{\circ}C$ Humidity: $90-95\%$ RH Test time: $500+24t-0$ hrs.Test temp:: $40\pm 2^{\circ}C$ Humidity: $90-95\%$ RH Test time: $500+24t-0$ hrs.Test temp:: $40\pm 2^{\circ}C$ Humidity: $90-95\%$ RH Test time: $500+24t-0$ hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at $40^{\circ}C$ and then set for $24\pm 2$ hrs at room temp. Measurement to be made after keeping at room temp. for $24\pm 2$ hrs.14Humidity (Damp Heat) Load14Humidity (Damp Heat) Load14Humidity (Damp Heat) Load14Humidity (Damp Heat) Load14Humidity (Damp Heat) Load15Test temp:: $40\pm 2^{\circ}C$ Humidity: $90-95\%$ RH Test time: $500+24t-0$ hrs. To apply test voltage for 1hr at $40^{\circ}C$ and then set for $24\pm 2$ hrs at room temp. Measurement to be made after keeping at room temp. for $24\pm 2$ hrs.14Humidity (Damp Heat) Load15Test temp: for $24\pm 2$ hrs.16D.F. SoV S							Cap change: X7R/X5 Y5V: wi Q/D.F. value:	R: within ±25	
13Humidity (Damp Heat) Steady StateTest time: $500+24/-0hrs$ . Before initial measurement (Class II only): Perform $150+0/-10^{\circ}$ C for 1 hr and then set for $24\pm 2$ hrs at room temp Measurement to be made after keeping at room temp. for $24\pm 2$ hrs. $25V, 16V$ $420\%$ $50V, 6.3V$ 14Humidity (Damp Heat) LoadTest temp:: $40\pm 2^{\circ}$ C Humidity: $90-95\%$ RH Test time: $500+24/-0$ hrs. To apply voltage : rated voltage Before initial measurement (Class II ov $410^{\circ}$ C and then set for $24\pm 2$ hrs.No remarkable damage. Cap change. $75V$ : within $\pm 25\%$ $16V$ is $310\%$ $25V$ 14Humidity LoadTest temp:: $40\pm 2^{\circ}$ C Humidity: $90-95\%$ RH Test time: $500+24/-0$ hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at $40^{\circ}$ C and then set for $24\pm 2$ hrs at room temp. Measurement to be made after keeping at room temp. for $24\pm 2$ hrs.No14Humidity (Damp Heat) LoadTest temp: for $24\pm 2$ hrs.D.F. $25V$ : $315\%$ $50V, 10V$ $520\%$ 15Sold addition to be made after keeping at room temp. for $24\pm 2$ hrs.D.F. $50V$ $50V$ 16D.F. $50V$ Sold $D.F.$ $50V$ 16D.F. $50V$ Sold $D.F.$ $50V$ 17Measurement to be made after keeping at room temp. for $24\pm 2$ hrs.D.F. $50V$ 18Sold $D.F.$ $50V$ Sold $D.F.$ $50V$ 19Sold $D.F.$ $50V$ Sold $D.F.$ $50V$ 10Sold $D.F.$ $50V$ Sold $D.F.$ $50V$ 14Sold $D.F.$ $50V$ Sold $D.F.$ $50V$			Humidity: 90~95% RH Test time: 500+24/-0hrs. Before initial measurement (Class II only): Perform 150+0/-10°C for 1 hr and			Rated vol.	D.F.		
13Humidity (Damp Heat) Steady StateBefore initial measurement (Class II only): Perform 150+0/-10°C for 1 hr and then set for 24±2 hrs at room temp Measurement to be made after keeping at room temp. for 24±2 hrs.10∨ $\leq 20\%$ $\leq 0.V$ 14Humidity (Damp Heat) LoadTest temp.: $40\pm2^{\circ}$ C Humidity: 90-95%RH Test time: 500+24±0 hrs.Image: Image for the set for 24±2 hrs.Image for the set for 24±2 hrs.14Humidity (Damp Heat) LoadTest temp.: $40\pm2^{\circ}$ C Humidity: 90-95%RH Test time: 500+24±0 hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at 40°C and then set for 24±2 hrs at room temp. Measurement to be made after keeping at room temp. for 24±2 hrs.No remarkable damage. Cap change. Cap change. Cap change. Cap change. C30%14Humidity (Damp Heat) LoadTest temp.: 40±2°C Humidity: 90-95%RH Test time: 500+24±0 hrs. To apply test voltage for 1hr at 40°C and then set for 24±2 hrs at room temp. Measurement to be made after keeping at room temp. for 24±2 hrs.No remarkable damage. Cap C30%14Humidity (Damp Heat) LoadTest time: 500+24±2 hrs at room temp. Measurement to be made after keeping at room temp. for 24±2 hrs.No remarkable damage. Cap C30%150SoloSoloSolo160D.F. 25V. 16VSolo17SoloSolo18SoloSolo19SoloSolo10SoloSolo10SoloSolo10SoloSolo10							25V, 16V	≤15%	
13   (Damp Heat) Steady State   only): Perform 150+0/-10°C for 1 hr and then set for 24±2 hrs at room temp Measurement to be made after keeping at room temp. for 24±2 hrs.   50V, 6.3V   ≤30%     14   Humidity (Damp Heat) Load   Test temp.: 40±2°C Humidity: 90-95% RH Test time: 500+24/-0 hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at 40°C and then set for 24±2 hrs.   No remarkable damage. Cap change: X7R/X5R: within ±25% Y5V: within ±30%; 6.3V, within +30/-40% Q/D.F. value: X7R/X5R:     14   Humidity (Damp Heat) Load   Test temp.: 40±2°C Humidity: 90-95% RH Test time: 500+24/-0 hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at 40°C and then set for 24±2 hrs at room temp. Measurement to be made after keeping at room temp. for 24±2 hrs.   No remarkable damage. Cap change: X7R/X5R: within ±25% Y5V: within ±30%; 6.3V, within +30/-40% Q/D.F. value: X7R/X5R:     14   Humidity (Damp Heat) Load   D.F. SoV ≤10%   D.F. SoV ≤10%	40					10V	≤20%		
14Humidity (Damp Heat) LoadTest temp.: $40\pm2^{\circ}C$ Humidity: $90-95\%$ RH Test time: $500+24/-0$ hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1 hr at $40^{\circ}C$ and then set for $24\pm2$ hrs at room temp.No Y5V:Rated vol. D.F.D.F. 50V 20%14Humidity (Damp Heat) LoadTest temp.: $40\pm2^{\circ}C$ Humidity: $90-95\%$ RH Test time: $500+24/-0$ hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1 hr at $40^{\circ}C$ and then set for $24\pm2$ hrs at room temp. Measurement to be made after keeping at room temp. for $24\pm2$ hrs.No No No No SV:No No No SV:Rated vol.D.F. 25V. 16V 250% 20%SUBLE SUBLE	13					50V, 6.3V	≤30%		
Image: Addition of the set							Y5V:		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$						Rated vol.	D.F.		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$				·		50V	≤10%		
Image: InterpretationInterpretation14Humidity (Damp Heat) LoadTest temp.: 40±2°C Humidity: 90~95%RH Test time: 500+24/-0 hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at 40°C and then set for 24±2 hrs at room temp. Measurement to be made after keeping at room temp. for 24±2 hrs.No remarkable damage. Cap change: X7R/X5R: within ±25% Y5V: within ±30%; 6.3V, within +30/-40% Q/D.F. value: X7R/X5R:14Humidity (Damp Heat) LoadTest temp.: 40±2°C Humidity: 90~95%RH Test time: 500+24/-0 hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at 40°C and then set for 24±2 hrs at room temp. Measurement to be made after keeping at room temp. for 24±2 hrs.No remarkable damage. Cap change: X7R/X5R: Rated vol.Rated vol.D.F. 50V 50VSolv\$10% 25VSolv\$10% 25VSolv\$20%							25V	≤15%	
14Humidity (Damp Heat) LoadTest temp.: $40\pm2^{\circ}C$ Humidity: $90-95\%$ RH Test time: $500+24/-0$ hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at $40^{\circ}C$ and then set for $24\pm2$ hrs at room temp. Measurement to be made after keeping at room temp. for $24\pm2$ hrs.No remarkable damage. Cap change: X7R/X5R: within $\pm 25\%$ $S0V.$ is the second sec							16V, 10V	≤20%	]
14Humidity (Damp Heat) LoadTest temp.: $40\pm2^{\circ}C$ Humidity: $90\sim95\%$ RH Test time: $500+24/-0$ hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at $40^{\circ}C$ and then set for $24\pm2$ hrs at room temp. Measurement to be made after keeping at room temp. for $24\pm2$ hrs.Cap change: $X7R/X5R$ : within $\pm 25\%$ Y5V: within $\pm 30\%$ ; $6.3V$ , within $\pm 30/-40\%$ Q/D.F. value: X7R/X5R:14Humidity (Damp Heat) LoadTest time: $500+24/-0$ hrs. To apply voltage i rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at $40^{\circ}C$ and then set for $24\pm2$ hrs at room temp. Measurement to be made after keeping at room temp. for $24\pm2$ hrs.Rated vol.D.F. $50V$ SOV $\leq 10\%$ $16V, 10V$ $\leq 20\%$							I.R.: 1GΩ or RxC≧10	) Ω-F whichev	er is smaller.
14Humidity (Damp Heat) LoadHumidity: $90 \sim 95\%$ RH Test time: $500+24/-0$ hrs. To apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at $40^{\circ}$ C and then set for $24\pm 2$ hrs at room temp. Measurement to be made after keeping at room temp. for $24\pm 2$ hrs.Rated vol.D.F.Rated vol. $\leq 20\%$ $6.3V$ $\leq 30\%$ $Y5V$ : $Rated vol.$ $D.F.$ $50V$ $\leq 10\%$ $50V$ $\leq 10\%$ $16V$ , $10V$ $\leq 20\%$			Tes	st te	mp.: 40±2°C		Cap change: X7R/X5 Y5V: wi Q/D.F. value:	R: within ±25	
14Humidity (Damp Heat) LoadTo apply voltage : rated voltage Before initial measurement (Class II only): To apply test voltage for 1hr at $40^{\circ}$ C and then set for 24±2 hrs at room temp. Measurement to be made after keeping at room temp. for 24±2 hrs. $25V, 16V$ $\leq 15\%$ $50V, 10V$ Rated vol.D.F. $50V$ $\leq 10\%$ $50V$ $\leq 10\%$ $50V$ $\leq 10\%$ $6.3V$ $\leq 30\%$ $75V$ : $16V$ $50V$ $\leq 10\%$ $16V, 10V$ $\leq 20\%$			Hur	midi	ity: 90~95%RH		Rated vol.	D.F.	
14   Humidity (Damp Heat) Load   Before initial measurement (Class II only): To apply test voltage for 1hr at 40°C and then set for 24±2 hrs at room temp.   50V, 10V   ≤20%     Measurement to be made after keeping at room temp. for 24±2 hrs.   Solve initial measurement (Class II only): To apply test voltage for 1hr at 40°C and then set for 24±2 hrs at room temp.   Solve initial measurement (Class II is in the set for 24±2 hrs at room temp.     14   Measurement to be made after keeping at room temp. for 24±2 hrs.   Solve is in the set for 24±2 hrs.     150V   ≤10%     16V, 10V   ≤20%							25V, 16V	≤15%	]
14(Damp Heat) Loadonly): To apply test voltage for 1hr at 40°C and then set for 24±2 hrs at room temp. Measurement to be made after keeping at room temp. for 24±2 hrs. $6.3V$ $\leq 30\%$ 9000000000000000000000000000000000000						ss II	50V, 10V	≤20%	]
40°C and then set for 24±2 hrs at room temp. Measurement to be made after keeping at room temp. for 24±2 hrs.Y5V:Rated vol.D.F. $50V$ $\leq 10\%$ $25V$ $\leq 15\%$ $16V, 10V$ $\leq 20\%$	14		only	y): ٦	To apply test voltage for 1	hr at	6.3V	≤30%	
Measurement to be made after keeping at room temp. for 24±2 hrs.Rated vol.D.F.50V≤10%25V≤15%16V, 10V≤20%		Luau			nd then set for 24±2 hrs a	at room	Y5V:		
at room temp. for 24±2 hrs. $50V$ $\leq 10\%$ $25V$ $\leq 15\%$ $16V, 10V$ $\leq 20\%$					rement to be made after k	keeping	Rated vol.	D.F.	
16V, 10V ≤20%							50V	≤10%	
							25V	≤15%	
							16V, 10V	≤20%	
I.R.: 500M $\Omega$ or RxC $\geq$ 5 $\Omega$ -F whichever is smaller.							I.R.: 500MΩ or RxC≥	≧5 Ω-F whiche	- ever is smaller.



#### Low Profile Multilayer SMD Ceramic Capacitor 0402 to 1210 Sizes, X7R, X5R & Y5V Dielectrics (MCTT Series)



No	Item		Test Co	ondition			Requireme	nts
		Test temp.: NP0, X7R/X7E: 125±3°C X5R, Y5V: 85±3°C Test time: 1000+24/-0 hrs. To apply voltage: 150% of rated				No remarkable dar Cap change: X7R/ Y5V: Q/D.F. value: X7R/X5R:	X5R: within ±25	% 3V, within +30/-40%
		voltage. 100% of r	ated volta	ge for belo	ow range.	Rated vol.	D.F.	
	High	Size	Dielectric	Rated	Capaci-	25V, 16V	≤15%	
1	Temperature		50V, 10V	≤20%				
15	Load		Y5V	6.3V,10V	C≧2.2µF	6.3V	≤30%	
	(Endurance)	TT21	Y5V	6.3V	C≧10µF	Y5V:		
		TT31	Y5V	6.3V	C≧22µF	Rated vol.	D.F.	
		Before ini only): To a				50V	≤10%	
		test temp.		•		25V	≤15%	1
			room temp.			16V, 10V	≤20%	1
		Measurement to be made after keeping at room temp. for 24±2 hrs			I.R.: 1GΩ or RxC≧	5 Ω-F whicheve	er is smaller.	

# Appendixes

#### Tape & Reel Dimensions



The dimension of paper tape



The dimension of plastic tape

Size	0402	0603	0805	12	:06	1210
Thickness	L	н	Т	т	J	т
A <sub>0</sub>	0.62±0.05	1.1 ±0.1	1.5 ±0.10	2 ±0.1	<1.85	<2.97
B <sub>0</sub>	1.12±0.05	1.9 ±0.1	2.3 ±0.10	3.5 ±0.1	<3.46	<3.73
Т	0.42±0.05	0.6 ±0.05	0.95 ±0.05	0.95 ±0.05	0.23±0.05	0.23±0.05
K <sub>0</sub>	-		-	-	<2.5	<2.50
W	8±0.1	8 ±0.1	8 ±0.10	8 ±0.1	8±0.1	8±0.1
P <sub>0</sub>	4 ±0.1	4 ±0.1	4 ±0.10	4 ±0.1	4±0.1	4±0.1
10xP <sub>0</sub>	40 ±0.1	40 ±0.1	40 ±0.10	40 ±0.1	40±0.1	40±0.1
P <sub>1</sub>	2 ±0.05	2 ±0.05	4 ±0.10	4±0.1	4±0.1	4±0.1
P <sub>2</sub>	2 ±0.05	2 ±0.05	2 ±0.05	2±0.05	2±0.05	2±0.05
D <sub>0</sub>	1.55 ±0.05	1.55 ±0.05	1.55 ±0.05	1.5±0.05	1.5±0.05	1.5±0.05





Size	0402	0603	0805	12	06	1210
Thickness	L	Н	Т	Т	J	т
D <sub>1</sub>	-		-	-	1±0.1	1±0.1
E	1.75 ±0.05	1.75 ±0.05	1.75 ±0.05	1.75±0.1	1.75±0.1	1.75±0.1
F	3.5 ±0.05	3.5 ±0.05	3.5 ±0.05	3.5±0.05	3.5±0.05	3.5±0.05



Size	603, 0805, 120	6, 1210	
Reel size	7"	10"	13"
С	13 +0.5/-0.2	13 +0.5/-0.2	13 +0.5/-0.2
W1	8.4 +1.5/-0	8.4+1.5/-0	8.4 +1.5/-0
A	178 ±0.10	250 ±1	330 ±1
N	60 +1/-0	100 ±1	100 ±1

The dimension of reel

# **Constructions:**



No.	Na	me	NP0*	NPO, X7R, Y5V	
1	Ceramic	material	BaTiO₃ based		
2	Inner el	ectrode	Ni		
3		Inner layer		Cu	
4	Termination Middle layer			Ni	
5	Outer layer		S	n (Matt)	

#### Storage and handling conditions

- (1) To store products at 5°C 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. The corrosive gas reacts on the terminal electrodes of capacitors, and results in the poor solderability. Do not store the capacitors in the ambience of corrosive gas (e.g., hydrogen sulfide, sulfur dioxide, chlorine, ammonia gas etc.)
- b. In corrosive atmosphere, solderability might be degraded, and silver migration might occur to cause low reliability.
- c. Due to the dewing by rapid humidity change, or the photochemical change of the terminal electrode by direct sunlight, the solderability and electrical performance may deteriorate. Do not store capacitors under direct sunlight or dewing condition. To store products on the shelf and avoid exposure to moisture.



# multicomp

# **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.



Recommended reflow soldering profile for SMT process with SnAgCu series solder paste.



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

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