

1.1 Technical Data

Maximum allowable continuous AC voltage*1
 Maximum allowable continuous DC voltage
 Varistor voltage Measured*2
 Varistor voltage tolerance
 Typical capacitance value measured*3
 Typical capacitance value tolerance
 Maximum clamping voltage measured*4
 Rated peak single pulse transient current at *5

Symbol	Value	Unit
V_{RMS}	3.5	V
V_{DC}	5.5	V
V_B	12.0	V
	±20	%
C	230	pF
	±30	%
V_C	19	V
I_P	20	A

1.2

Maximum Energy Absorption 10/1000 μ s
 Response time
 Leakage current at $V_B \times 80\%$ (At initial state)
 Leakage current at $V_B \times 80\%$ (After reliability Test)
 Operating ambient temperature
 Storage temperature
 Reflow temperature profile(Recommend)

E	0.02	J
T_{rise}	<1	ns
I_{LVB}	<20	μ A
I_{LVBA}	<100	μ A
	-55~+125	$^{\circ}$ C
	-40~+125	$^{\circ}$ C
	260	$^{\circ}$ C

1.3 Other Data

Body
 End termination
 Packaging
 Complies with Standard

ZnO
 Ag/Ni/Sn
 Tape
 IEC61000-4-2、IEC61000-4-5

Notes:

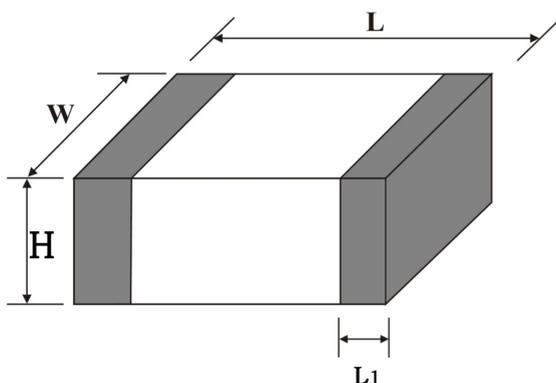
- *1 AC voltage at 50-60Hz
- *2 Varistor voltage
- *3 Capacitance
- *4 Maximum clamping voltage
- *5 Rated peak single pulse transient current

Measured at 1mA DC
 Measured at f=1kHz, Vrms=0.5V
 Measured at 1A by 8/20 μ s Pulse
 Measured by 8/20 μ s Pulse

Size:

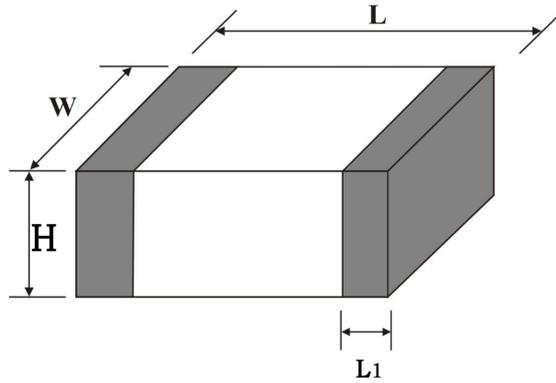
Unit: mm

Type	Length (L)	Width (W)	High (H)	Termination (L1)
0402=1005	1.00±0.20	0.50±0.20	0.70 (max)	0.30±0.20

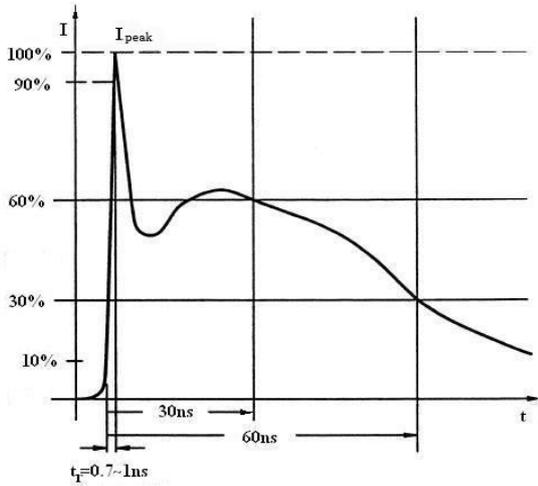


2.Size

Model	1005(0402)	1608(0603)	2012(0805)	3216(1206)	3225(1210)	4532(1812)	5650(2220)	08CL(3220)
Length(L)	1.00±0.15	1.60±0.20	2.00±0.20	3.20±0.20	3.20±0.20	4.50±0.20	5.60±0.20	8.00±0.30
Width(W)	0.50±0.15	0.80±0.20	1.20±0.20	1.60±0.20	2.50±0.20	3.20±0.20	5.00±0.20	5.00±0.30
High(H)	0.70max	0.90max	1.30max	1.60max	2.50max	3.00max	3.50max	3.50max



3.Esd Wave Form

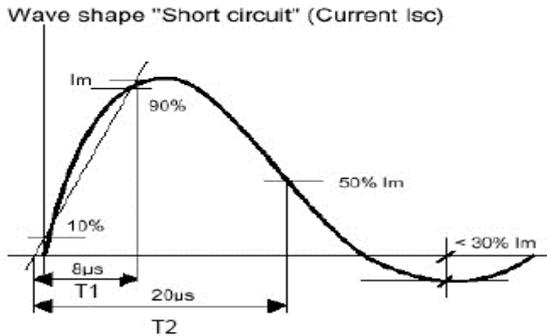


IEC61000-4-2 Standards

SEVERITY LEVEL	AIRDIRCHARGE	DIRECT ISCHARGE
1	2 kV	2 kV
2	4 kV	4 kV
3	8 kV	6 kV
4	15 kV	8 kV

IEC61000-4-2 Compliant ESD Current Pulse Waveform

4.Surge Wave Form



SEVERITY LEVEL	T1	T2
1	8 μs	20 μs

IEC61000-4-5 Standards

5.Environmental Reliability Test

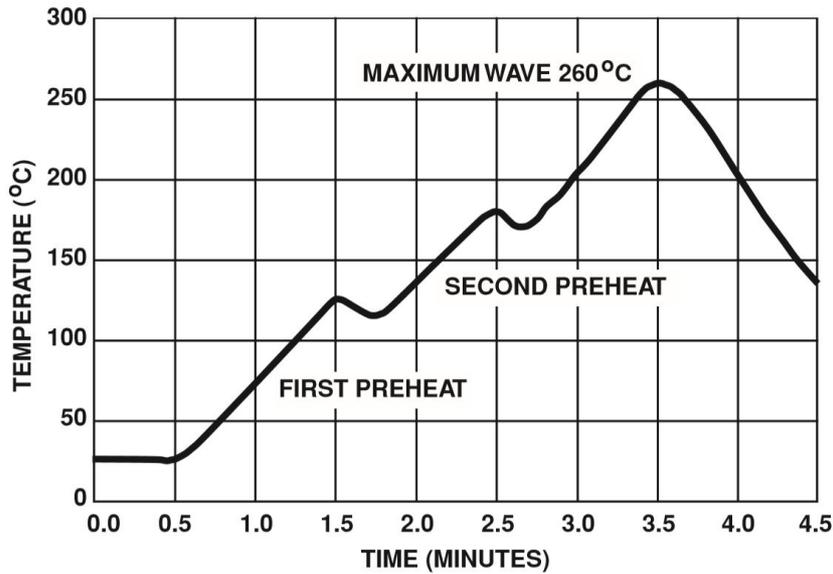
Characteristic	Test method and description			
High Temperature Storage	The specimen shall be subjected to 125°C for 1000 hours in a thermostatic bath without load and then stored at room temperature and humidity for 1 to 2 hours. The change of varistor voltage shall be within 10%.			
Temperature Cycle	The temperature cycle of specified temperature shall be repeated five times and then stored at room temperature and humidity for one two hours. The change of varistor voltage shall be within 10% and mechanical damage shall be examined.	Step	Temperature	Period
		1	-40 ± 3°C	30min ± 3
		2	Room Temperature	1~2hours
		3	125 ± 2°C	30min ± 3
4	Room Temperature	1~2hours		
High Temperature Load	After being continuously applied the maximum allowable voltage at 85°C for 1000hours, the specimen shall be stored at room temperature and humidity for one or hours, the change of varistor voltage shall be within 10%.			
Damp Heat Load/ Humidity Load	The specimen should be subjected to 40°C, 90 to 95%RH environment, and the maximum allowable voltage applied for 1000 hours, then stored at room temperature and humidity for one or two hours. The change of varistor voltage shall be within 10%.			
Low Temperature Storage	The specimen should be subjected to -40°C, without load for 1000 hours and then stored at room temperature for one two hours. The change of varistor voltage shall be within 10%.			

6.Soldering Recommendation

The principal techniques used for the soldering of components in surface mount technology are infrared reflow and wave soldering.

6.1 Wave Soldering

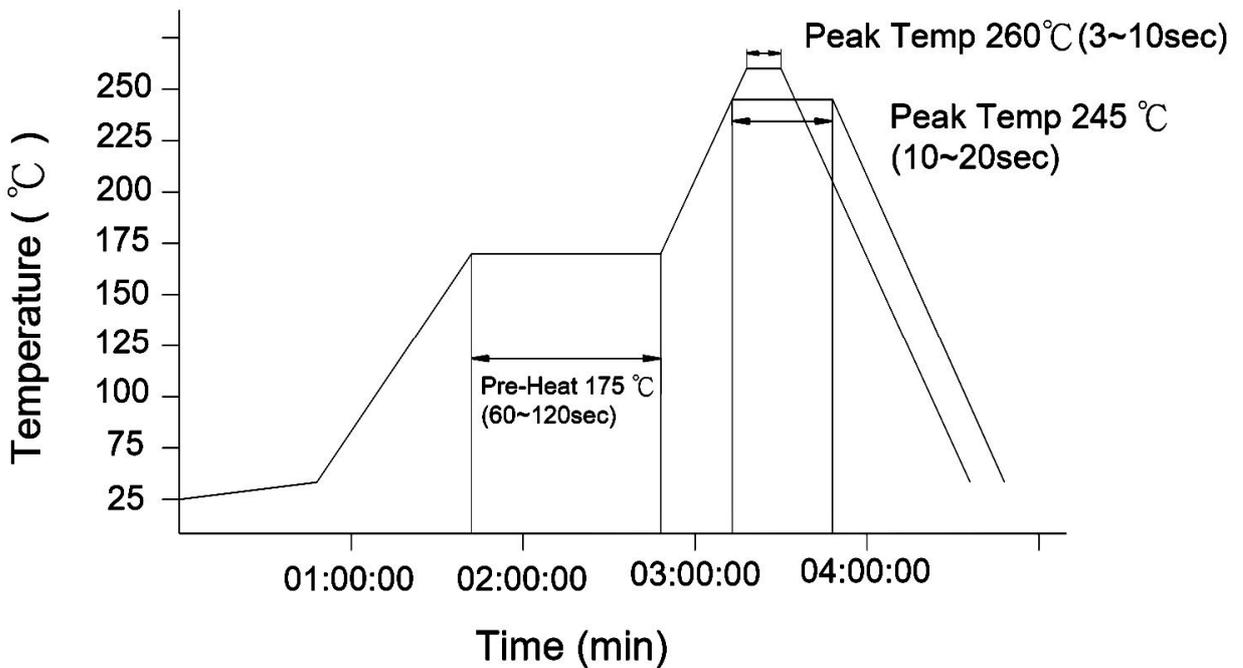
When wave soldering. The MLCV is attach to the circuit board by means of an adhesive. The assembly is then place on a conveyor and run though the soldering process to contact the wave. Wave soldering is the most strenuous of the processes. To avoid the possibility of generating stresses due to thermal shock., a preheat stage in the soldering process is recommended, and the peak temperature of the solder process should be rigidly controlled. The following is the typical profiles.



WAVE SOLDER PROFILE

6.2 Reflow Soldering

When reflow soldering, the device is placed a solder paste on the substrate ,as the solder paste is heated, it re-flows and solders the unite to board. When using a reflow process ,care should be taken to ensure that the MLCV is not subjected to an thermal gradient steeper than 4 degrees per second; the ideal gradient being 2degrees per second. During the soldering process, preheating to within 100 degrees of the soldier’s peak temperature is essential to minimize thermal shock. The following is typical profile.



REFLOW SOLDER PROFILE