1 Electrical Characteristics

1.1 Technical Data	Symbol	Value	Unit
Maximum allowable continuous AC voltage*1	V_{RMS}	11	V
Maximum allowable continuous DC voltage	V_{DC}	14	V
Varistor voltage Measured*2	V_B	18(15.5-21)	V
Typical capacitance value measured*3	C	250	pF
Typical capacitance value tolerance		±50	%
Maximum clamping voltage measured*4	V_C	30	V
Rated peak single pulse transient current at *5	I_P	30	A
1.2 Reference Data			
Maximum Energy Absorption 10/1000μS	E	0.1	J
Response time	T_{rise}	<2	ns
Leakage current at V_{DC} (At initial state)	I_L	<50	μA
Leakage current at V_{DC} (After reliability Test)	I_{LA}	<100	μA
Operating ambient temperature		-40~+125	℃
Storage temperature		-40~+125	℃
Reflow temperature profile(Recommend)		260	℃

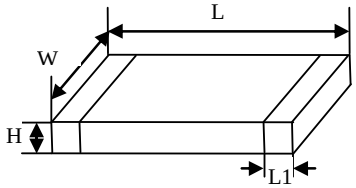
1.3 Other Data	
Body	ZnO
End termination	Ag/Ni/Sn
Packaging	Bulk/Tape
Complies with Standard	IEC61000-4-5

Notes:

*1 AC voltage at 50~60Hz	
*2 Varistor voltage	Measured at 1mA DC
*3 Capacitance	Measured at f=1MHz,Vrms=0.5V
*4 Maximum clamping voltage	Measured at 1A by 8/20μs Pulse
*5 Rated peak single pulse transient current	Measured by 8/20μs Pulse

Size: Unit：mm

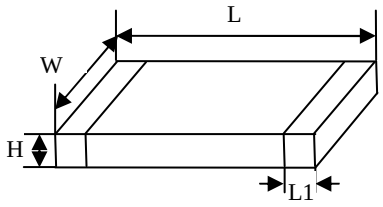
Type	Length（L）	Width（W）	High（H）	Termination（L1）
1608	1.60±0.10	0.80±0.10	0.80(max)	0.35±0.10



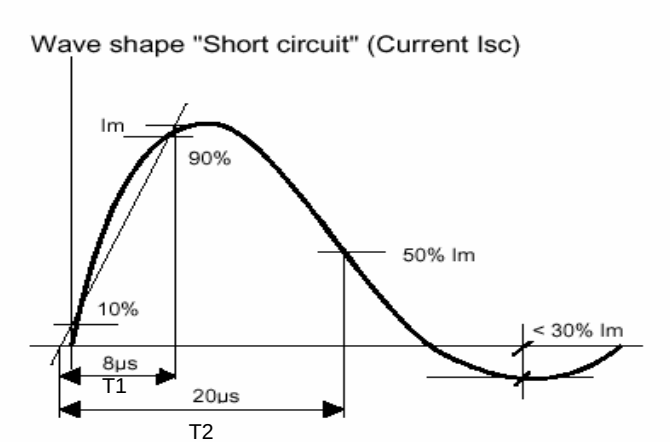
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2.Size

Model	1005(0402)	1608(0603)	2012(0805)	3216(1206)	3225(1210)	4532(1812)	5750(2220)	8050(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±0.30	5.70±0.30	8.0±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±0.30	5.00±0.30
High(H)	0.70max	0.90max	1.30max	1.60max	2.50max	3.20max	4.50max	4.50max



3.Surge Wave Form



SEVERITY LEVEL	T1	T2
1	8 uS	20 uS
2	10 uS	1000 uS

8/20µs waveform current

IEC61000-4-5 Standards

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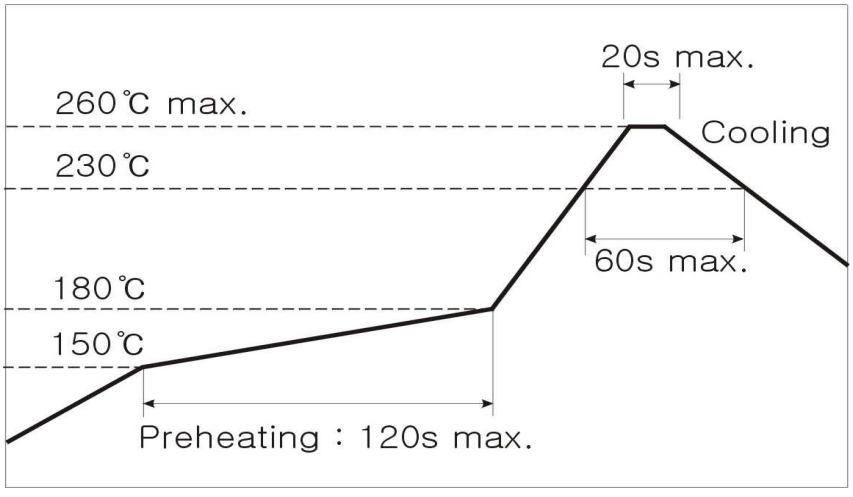
4.Enviromental Reliability Test

<table>
<tr><td>Characteristic</td><td colspan="4">Test method and description</td></tr>
<tr><td>High Temperature Storage</td><td colspan="4">The specimen shall be subjected to 125℃ 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%.</td></tr>
<tr><td>Temperature Cycle</td><td colspan="2" rowspan="5">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.</td><td>Step</td><td>Temperature</td><td>Period</td></tr>
<tr><td></td><td>1</td><td>-40±3℃</td><td>30min±3</td></tr>
<tr><td></td><td>2</td><td>Room Temperature</td><td>1~2hours</td></tr>
<tr><td></td><td>3</td><td>125±2℃</td><td>30min±3</td></tr>
<tr><td></td><td>4</td><td>Room Temperature</td><td>1~2hours</td></tr>
<tr><td>High Temperature Load</td><td colspan="4">After being continuously applied the maximum allowable voltage at 85℃ 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%.</td></tr>
<tr><td>Damp Heat Load/ Humidity Load</td><td colspan="4">The specimen should be subjected to 40℃, 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%.</td></tr>
<tr><td>Low Temperature Storage</td><td colspan="4">The specimen should be subjected to -40℃, without load for 1000 hours and then stored at room temperature for one two hours. The change of varistor voltage shall be within 10%.</td></tr>
</table>

5.Soldering Recommendation

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

5.1 Pb free solder paste

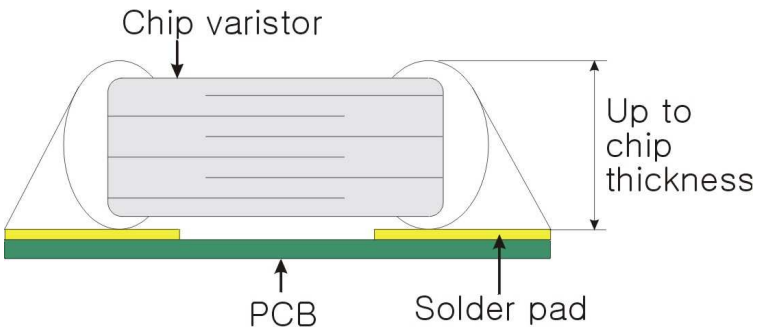


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5.2 Repair soldering

5.2.1 Allowable time and temperature for making correction with a soldering iron: 350 ± 10 ℃, 3 sec.

5.2.2 Optimum solder amount when corrections are made using a soldering iron



5.3 Soldering guidelines

5.3.1 Our chip varistors are designed for reflow soldering only. Do not use flow soldering

5.3.2 Use non-activated flux (Cl content 0.2% max.)

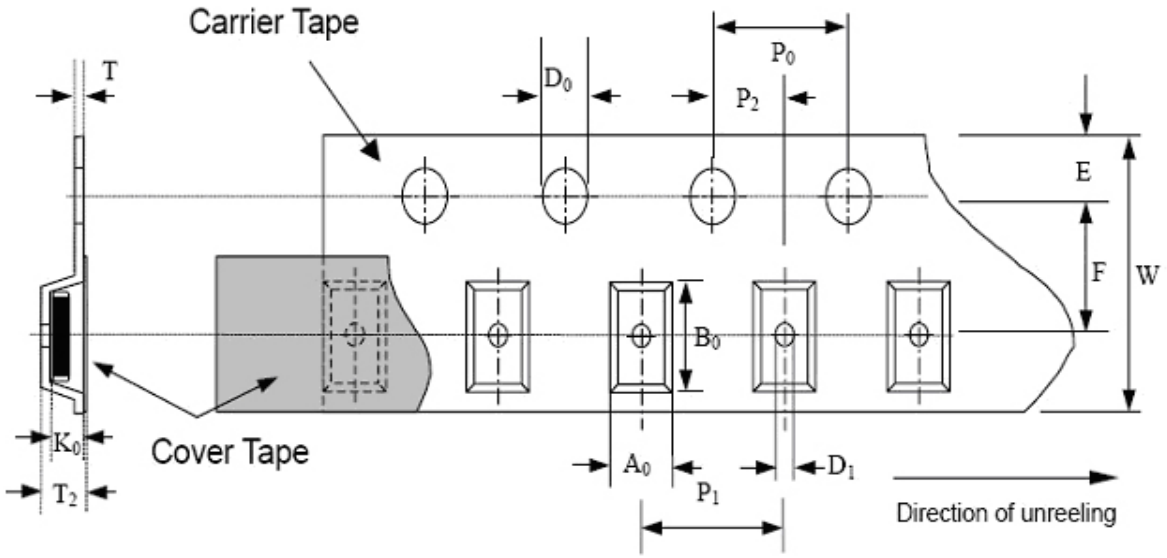
5.3.3 Follow the recommended soldering conditions to avoid varistor damage.

6 Packaging Specification

6.1 Carrier tape transparent cover tape should be heat-sealed to carry the products, and the reel should be used to reel the carrier tape.

6.2 The adhesion of the heat-sealed cover tape shall be 40 + 20/ - 15 grams.

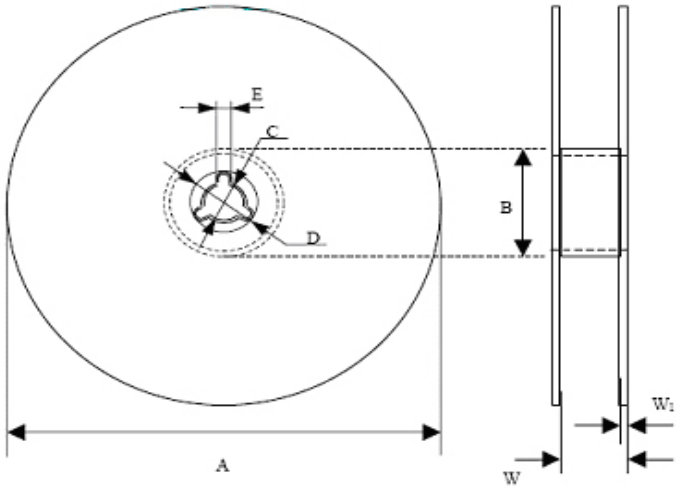
6.3 Both the head and the end portion of taping shall be empty for reel package and SMT auto-pickup machine. And a normal paper tape shall be connected in the head of taping for the operator handle.



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type	A_0 ±0.10	B_0 ±0.10	K_0 ±0.10	T ±0.05	T_2 ±0.05	D_0 +0.10	D_1 ±0.05	P_1 ±0.10	P_2 ±0.05	P_0 ±0.05	W ±0.20	E ±0.10	F ±0.05
0402	1.08	1.88	1.04	0.22	0.87	1.50	1.00	4.00	2.00	4.00	8.00	1.75	3.50
0603	1.08	1.88	1.04	0.22	1.17	1.50	1.00	4.00	2.00	4.00	8.00	1.75	3.50
0805	1.42	2.30	1.04	0.22	1.26	1.50	1.00	4.00	2.00	4.00	8.00	1.75	3.50
1206	1.88	3.50	1.27	0.20	1.49	1.50	1.00	4.00	2.00	4.00	8.00	1.75	3.50
1210	2.18	3.46	1.45	0.22	1.77	1.50	1.00	4.00	2.00	4.00	8.00	1.75	3.50
1812	3.66	4.95	1.74	0.25	1.99	1.50	1.50	8.00	2.00	4.00	12.00	1.75	5.50
2220	5.10	5.97	2.80	0.25	3.05	1.50	1.50	8.00	2.00	4.00	12.00	1.75	5.50
3220	5.50	8.50	2.80	0.30	3.50	1.50	1.50	8.00	2.00	4.00	16.00	1.75	7.50

7. reel dimension



type	A	B	C	D	E	W	W_1
0402-1210	178.0±1.0	60.0±0.5	13.0±0.2	21.0±0.2	2.0±0.5	9.0±0.50	1.5±0.15
1812-3220	178.0±1.0	60.0±0.5	13.5±0.1	21.0±0.2	2.0±0.5	13.6±0.2	1.5±0.15

type		1005	1608	2012		3216	3225	4532	5750	3220
quantity	paper	10000	4000	4000	-	-	-	-	-	
	plastic	-	-	-	3000	3000	2000/3000	1000	800/1000	1000

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