MSK0402-24V

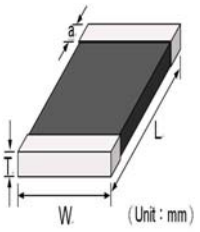
1.1 Technology Data	Symbol		Value	Unit
Maximum allowable continuous AC voltage at 50-60Hz	V_{RMS}		18	V
Maximum allowable continuous DC voltage	V_{DC}		12	V
Varistor voltage measured *1	Vv		100~150	V
Typical capacitance value measured at 1MHz	C		0.2	pF
Typical capacitance value tolerance			+80-20	%
Maximum ESD allowable clamping Voltage*2	V_{CLAMP}	<	200	V
Leakage current at V_{DC}*3 (At initial state)	I_{LDC}	<	0.1	uA
Leakage current at V_{DC}*3 (After ESD Test)	I_{LDCA}	<	2	uA
1.2 Reference Data				
Response time	T_{rise}	<	0.5	ns
Operation ambient temperature			-50～ +85	℃
Storage temperature			-50～+125	℃
ESD testing	IEC61000-4-2		level 4	
1.3 Other Data				
Body			ZnO	
End termination			Ag/Ni/Sn	
Packaging			Reel	
Complies with Standard			IEC61000-4-2	
Complies with RoHs Standard			Yes	
Lead Content		<	1000	ppm
Marking			None	

Notes：

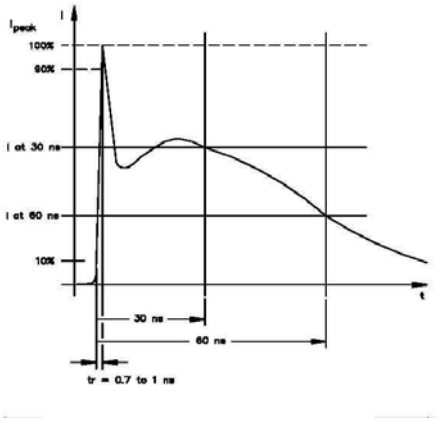
* 1 The varistor voltage was measured at 1 mA current
* 2 The Clamping voltage was measured at 8*20 us standard current.
* 3 The Leakage current was measured at working voltage.
* 4 The Energy only for customer reference.
* 5 The components shall be employed within 1 year, in the nitrogen condition.

2 .Size

Model	0402(1005)	0603(1608)	0805(2012)	1206(3216)	1210(3225)	1812(4532)	2220(5750)
Length(L)	1.00 ±0.10	1.60±0.15	2.00±0.20	3.20±0.20	3.20±0.20	4.50±0.20	5.70±0.20
Width(W)	0.50 ±0.10	0.80±0.10	1.25±0.15	1.60±0.15	2.50±0.20	3.20±0.20	5.00±0.20
Thickness(T)	0.60 max	0.90 max	1.20 max	1.50 max	1.50 max	2.00 max	2.50 max
Termination(a)	0.25±0.1	0.3±0.1	0.3±0.1	0.5±0.2	0.5±0.2	0.5+0.3/-0.1	0.5+0.3/-0.1



3. ESD Wave Form



IEC61000-4-2 Standards

SEVERITY LEVEL	AIRDIRCHARGE	DIRECT DISCHARGE
1	2 KV	2 KV
2	4 KV	4 KV
3	8 KV	6 KV
4	15 KV	8 KV

IEC 61000-4-2 Compliant ESD Current Pulse Waveform

4. Environment Reliability Test

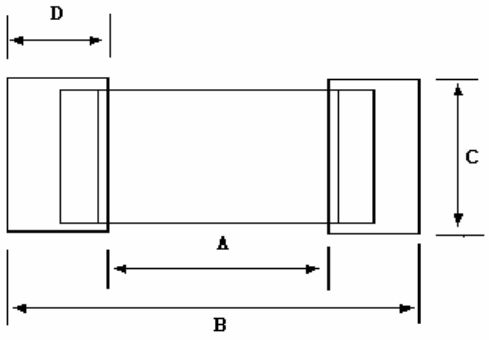
Characteristic	Test method and description			
High Temperature Storage	The specimen shall be subjected to 125 ± 2℃ for 1000 ± 12 hours in a thermostatic bath without load and then stored at room temperature and normal humidity for 1 to 2 hours. The change of varistor voltage shall be within 10 ％ .			
Temperature Cycle	The temperature cycle of specified temperature shall be repeated five times and then stored at room temperature and normal humidity for one or two hours. The change of varistor voltage shall be within 10 ％ and mechanical damage shall be examined.	Step	Temperature	Period
		1	-40±3℃	30Min±3
		2	Room Temperature	1 hour
		3	125±3℃	30Min±3
		4	Room Temperature	1 hour
High Temperature Load	After being continuously applied the maximum allowable voltage at 85 ± 2℃ for 1000± 2 hours, the specimen shall be stored at room temperature and normal humidity for one or two hours, the change of varistor voltage shall be within 10% .			
Damp Heat Load/ Humidity Load	The specimen should be subjected to 40 ± 2℃, 90 to 95 ％ RH environment, and the maximum allowable voltage applied for 1000 hours, then stored at room temperature and normal 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 ± 2℃, without load for 500 hours and then stored at room temperature for one or two hours. The change of varistor voltage shall be within 10 ％			

5. Soldering Recommendations

5.1 Recommended solder pad layout

（Unit：mm）

	A	B	C	D
0402	0.4~0.6	1.4~1.8	0.5~0.6	0.6~1.2
0603	0.9~1.2	2.7~3.2	0.7~1.0	0.9~1.2
0805	1.0~1.5	2.6~3.2	1.2~1.5	1.1~1.8
1206	1.8~2.5	4.2~5.2	1.2~1.8	1.2~1.8
1210	1.8~2.5	4.2~5.2	2.2~3.0	1.3~2.0
1812	2.5~3.3	5.5~6.7	2.8~3.6	1.3~2.2
2220	3.8~4.6	6.6~7.8	4.8~5.5	1.3~2.2

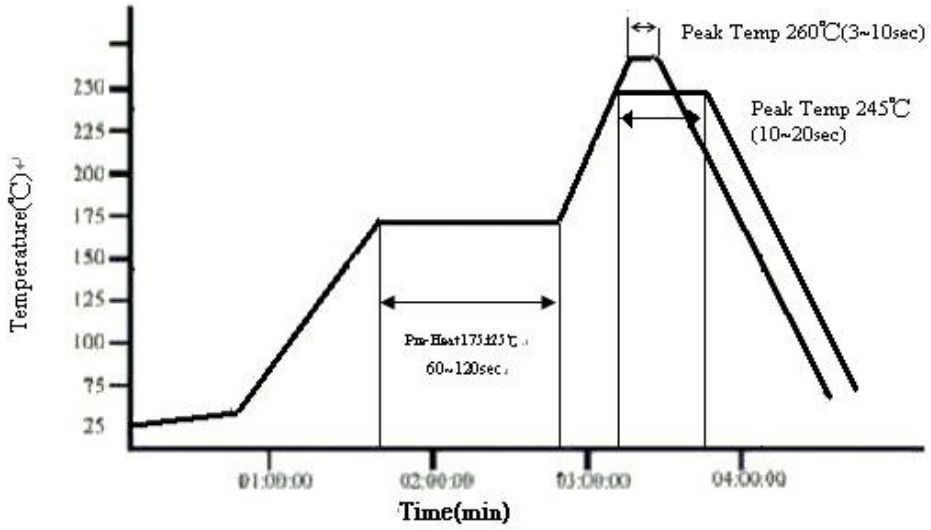


5.2 The SIR test of the solder paste shall be done（Based on JIS-Z-3284）

5.3 Steel plate and foot distance printing

Foot distance printing (mm)	Steel Plate thickness (mm)
> 0.65mm	0.18mm
0.65mm~0.5mm	0.15mm
0.50mm~0.40mm	0.12mm
>=0.40 mm	0.10mm

5.4The IR reflow and temperature of Soldering for Pb Free



☆ IR reflow Pb Free Process suggestion profile

(1) The solder recommend is Sn96.5/Ag 3.5 of 120 to 150 μm

(2) Ramp-up rate (217℃ to Peak) + 3℃/second max

(3) Temp. maintain at 175 +/-25℃ 180 seconds max

(4) Temp. maintain above 217 ℃ 60-150 seconds