

For ESD Protection- Low capacitance Series

Part No.	Size (mm)	Vw	Trigger Voltage* (Vt)	Clamping Voltage* (Vc)	ESD		ESD Pulse Withstand* min.	Cp (1MHz , 1Vrms)
					Contact	Air		
JES0402C5R5T0R2	0402	5.5	500	35	8KV	15KV	500	0.2
JES0402C120T0R2		12						
JES0402C5R5T0R1		5.5						0.1
JES0402C120T0R1		12						
JES0603C5R5T0R2	0603	5.5	500	35	8KV	15KV	500	0.2
JES0603C120T0R2		12						
JES0603C240T0R2		24						
JES0603C5R5T0R1		5.5						0.1
JES0603C120T0R1		12						
JES0603C240T0R1		24						

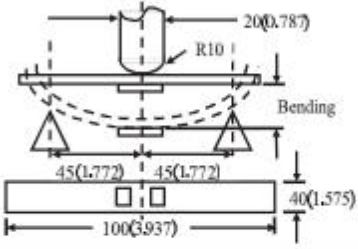
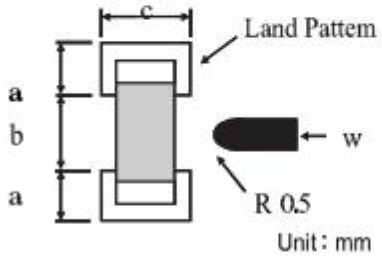
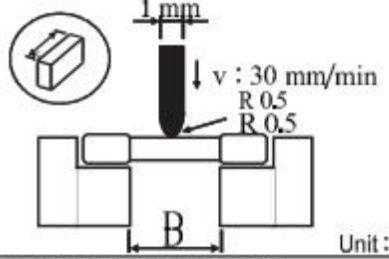
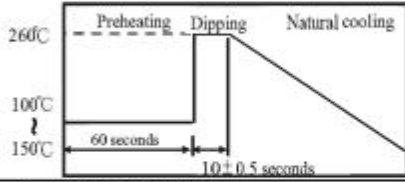
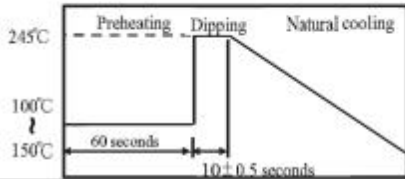
* - Per IEC 61000-4-2, 8KV , Clamp measurement made 30ns after initiation of pulse , all test in contact discharge mode.

Vw - The max. steady state DC operating voltage of which varistor could maintain also not exceeding 50 μ A leakage current.

Vc - The peak voltage acrossed the varistor measured at a specified pulse current and waveform.

C - The device capacitance measured with zero volt bias , 1MHz.

Reliability-Multilayer Chip Varistor

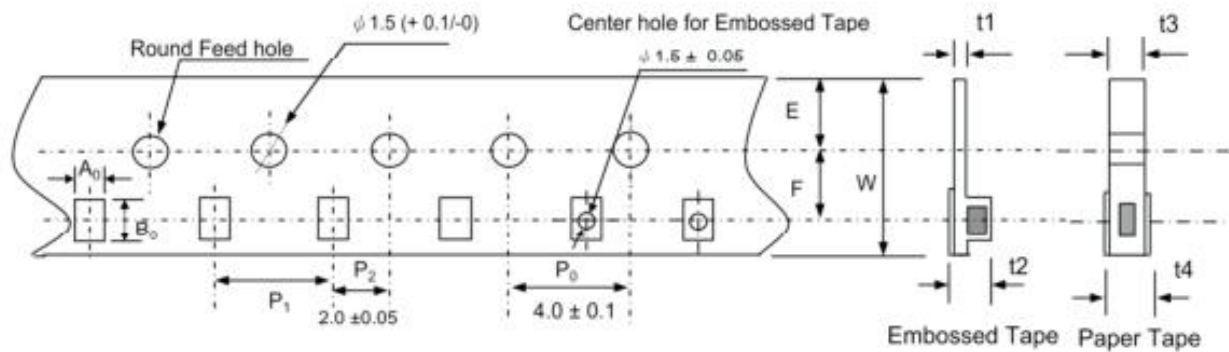
Test description	Standard	Performance	Test condition																																								
Board flexure strength	IEC60068-2-21	No mechanical damage shall be noticed even when the board is bent 2mm (0.079inches)	Solder a chip on a test substrate. Bend the substrat by 2mm(0.079in) 																																								
Flexure strength	Specification Standard	The terminal electrode and chip body must not be damaged by the forces applied. <table border="1" data-bbox="406 795 981 963"> <thead> <tr> <th>SIZE</th> <th>0402</th> <th>0603</th> <th>0805</th> <th>1206</th> <th>1210</th> <th>1812</th> <th>2220</th> </tr> </thead> <tbody> <tr> <td>a</td> <td>-</td> <td>1.0</td> <td>1.0</td> <td>1.3</td> <td>1.3</td> <td>1.5</td> <td>1.8</td> </tr> <tr> <td>b</td> <td>-</td> <td>0.8</td> <td>1.0</td> <td>1.5</td> <td>1.5</td> <td>3.6</td> <td>4.6</td> </tr> <tr> <td>c</td> <td>-</td> <td>1.3</td> <td>1.3</td> <td>3.0</td> <td>3.0</td> <td>3.8</td> <td>5.8</td> </tr> <tr> <td>w(kgf)</td> <td>-</td> <td>1.0</td> <td>4.0</td> <td>5.0</td> <td>5.0</td> <td>5.0</td> <td>5.0</td> </tr> </tbody> </table>	SIZE	0402	0603	0805	1206	1210	1812	2220	a	-	1.0	1.0	1.3	1.3	1.5	1.8	b	-	0.8	1.0	1.5	1.5	3.6	4.6	c	-	1.3	1.3	3.0	3.0	3.8	5.8	w(kgf)	-	1.0	4.0	5.0	5.0	5.0	5.0	
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Bending strength	IEC60068-2-21	The ceramic chip shall not be damaged by the forces applied under the following conditions. <table border="1" data-bbox="406 1108 981 1209"> <thead> <tr> <th>TYPE</th> <th>0402</th> <th>0603</th> <th>0805</th> <th>1206</th> <th>1210</th> <th>1812</th> <th>2220</th> </tr> </thead> <tbody> <tr> <td>D(mm)</td> <td>-</td> <td>1.3</td> <td>1.3</td> <td>2.0</td> <td>2.0</td> <td>3.8</td> <td>4.8</td> </tr> <tr> <td>W(kgf)</td> <td>-</td> <td>2.0</td> <td>3.0</td> <td>4.0</td> <td>4.0</td> <td>5.0</td> <td>5.0</td> </tr> </tbody> </table>	TYPE	0402	0603	0805	1206	1210	1812	2220	D(mm)	-	1.3	1.3	2.0	2.0	3.8	4.8	W(kgf)	-	2.0	3.0	4.0	4.0	5.0	5.0																	
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Resistance to solderheat	IEC60068-2-20	The ceramic chip shall not be damaged. Shall be covered with solder. Vb: Within ±10% of the initial value.	Preheat:100°C~150°C,60seconds Solder temperature:260±5°C Dip time:10±1 seconds 																																								
Solderability	IEC60068-2-58	More than 90% of terminal electrode shall be covered with solder.	Preheat:100°C~150°C,60seconds Solder temperature:245±3°C Dip time:3±0.3seconds 																																								

Metal Oxide Varistor

Reliability-Multilayer Chip Varistor

Test description	Standard	Performance	Test condition
High temperature Load	IEC61051-1	Appearance:ceramic chip shall not be damaged. Vb:Within $\pm 10\%$ of the initial value	Temperature: $85 \pm 2^\circ\text{C}$ Testing time:1000 \pm 24hours Load Voltage:Working voltage Measurement : After placing for 24 hours min.
Damp Heat Load, Steady State	IEC60068-2-78	Appearance:ceramic chip shall not be damaged. Vb:Within $\pm 10\%$ of the initial value	Humidity:90 to 95% RH Temperature: $40 \pm 2^\circ\text{C}$ Testing time:500 \pm 24 hours at V_{DC} Measurement : After placing for 24 hours min.
Rapid Change of Temperature	IEC61051-1	Appearance:Cracking, chipping or any other defects harmful to the characteristics shall not be allowed Vb:Within $\pm 10\%$ of the initial value	Temperature: $-40, +125^\circ\text{C}$, Keeping 30 minutes Cycle:100cycles Measurement : After placing for 24 hours min.
Low temperature storage	IEC61051-1	Appearance:Cracking, chipping or any other defects harmful to the characteristics shall not be allowed Vb:Within $\pm 10\%$ of the initial value	Temperature: $-40 \pm 5^\circ\text{C}$ Testing time:1000 \pm 24hours Measurement:After placing for 24 hours min.
High temperature storage	IEC61051-1	Appearance:Cracking, chipping or any other defects harmful to the characteristics shall not be allowed Vb:Within $\pm 10\%$ of the initial value	Temperature: $125 \pm 5^\circ\text{C}$ Testing time:1000 \pm 24hours Measurement:After placing for 24 hours min.
Max. Energy	Specification Standard	Appearance:ceramic chip shall not be damaged. Vb:Within $\pm 10\%$ of the initial value	10/1000us Waveform, W_{max} , 1 surge current
ESD test	IEC61000-4-2	Appearance:ceramic chip shall not be damaged. Vb:Within $\pm 50\%$ of the initial value (For MLV-P/C/E/JES application test only)	Discharge:Air discharge Voltage:15kV Polarity: +, - Number:10 times in 10 seconds. Discharge: Contact discharge Voltage:8kV Polarity: +, - Number:10 times in 10 seconds.

Carrier Tape Specifications



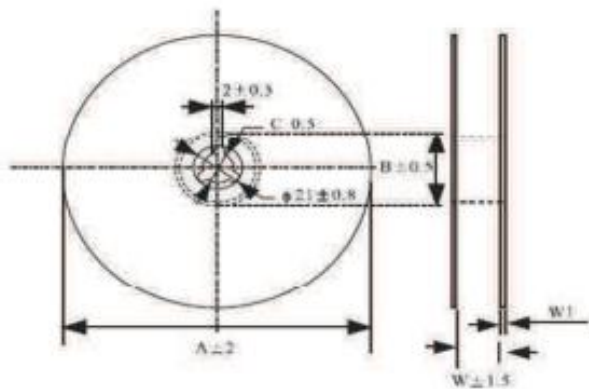
Dimensions of Embossed Tape

Size	A ₀ ±0.1 (mm)	B ₀ ±0.1 (mm)	P±0.1 (mm)	t ₁ /b (mm)	t ₁ /t ₂ (mm)	Quantity/Reel(Pcs)	
						Paper Tape	Embossed Tape
0402	0.62	1.10	2	—	1.0max/ 1.1max	10000	—
0603	1.08	1.88	4	—	1.0max/ 1.1max	4000	—
0805	1.42	2.30	4	0.6max/2.0max	1.0max/ 1.1max	4000	4000
1206	1.88	3.50	4	0.6max/2.9max	—	—	3000
1210	2.18	3.46	4	0.6max/2.9max	—	—	2000
1812	3.66	4.95	8	0.6max/2.9max	—	—	1000
2220	5.10	5.97	8	0.6max/2.9max	—	—	1000

A₀: Width of Cavity
B₀: Length of Cavity
P₁: Pitch

t₁: Embossed Tape Thickness
t₂: Height of Embossed Tape
t₃: Paper Tape for Width
t₄: Paper Tape Bottom Width

Reel Specifications

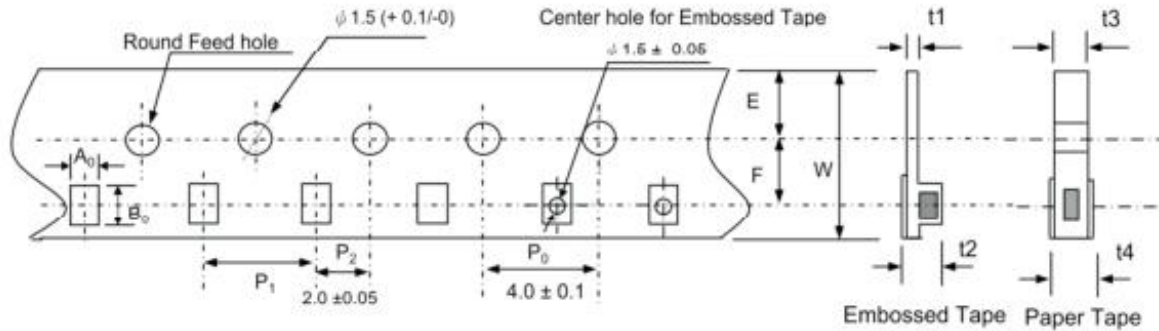


Dimensions

Size	A	B	C	W	1W
0402	178	60	13	10	1.6
0603	178	60	13	10	1.6
0805	178	60	13	10	1.6
1206	178	60	13	10	1.6
1210	178	60	13	10	1.6
1812	178	60	13.5	13.6	1.6
2220	178	60	13.5	13.6	1.6



Carrier Tape Specifications



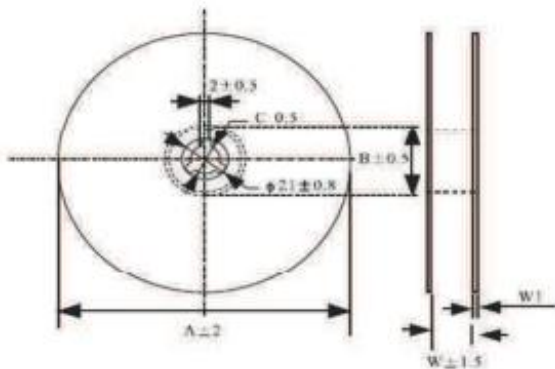
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2220	5.10	5.97	8	0.6max/2.9max	—	—	1000

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