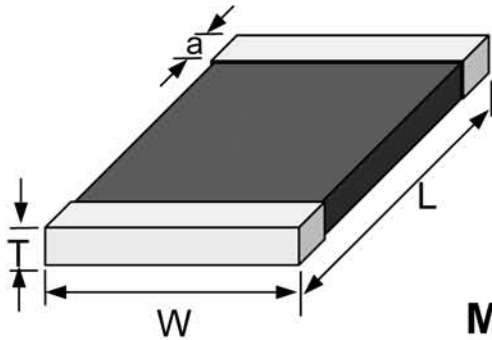


HOW TO ORDER

MLVs

J	V	0402	ML	050	A	P	T
Type code	Chip Size	Style	Rated Voltage Code, V _m (DC)	Capacitance Code	Termination Type	Packing Code	
J : JumboTek	0402	ML: Multilayer	030 = 3.3V	A: Standard	P: Electroplating by Ni/Sn	T: Tape & Reel	
V: TVS Devices	0603		050 = 5.5V	L: Low Capacitance	N: Ag/Pt	B: Bulk	
E: ESD Devices	0805		:	E: 1.5 pF			
H: High-Speed Devices	1206		:	H: 3 pF			
A: Automotive Devices	1210		:	J: 5.6 pF			
	1812		:	W: 12 pF (Typical)			
	2220		680 = 68.0V				
			121 = 120.0V				

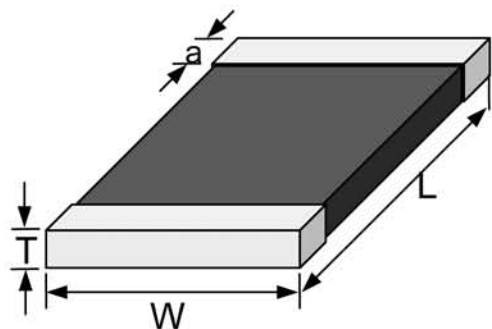


Mechanical Dimensions (Unit : mm)

Chip Size	L	W	Tmax.	a
0402	1.00±0.10	0.50±0.10	0.60	0.25±0.15
0603	1.60±0.15	0.80±0.15	0.90	0.35±0.15
0805	2.00±0.20	1.25±0.15	1.20	0.40±0.25
1206	3.20±0.20	1.60±0.20	1.60	0.50±0.25
1210	3.20±0.30	2.50±0.30	1.80	0.50±0.25
1812	4.50±0.35	3.20±0.30	1.80	0.50±0.25
2220	5.70±0.40	5.00±0.40	3.00	0.75±0.25

Chip MOV

J	V	08	CH	271	T
Type code	Chip Size	Style	Varistor Breakdown Voltage Code, V _N (DC)	Packing Code	
J : JumboTek	L x W 8mm x 5mm (EIA size : 3220)	CH: Chip	180 = 18V	T: Tape & Reel	
V: Varistor			:	B: Bulk	
			:		
			471 = 470V		



Mechanical Dimensions

SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
T	-	0.080	-	2.03
a	0.016	0.050	0.41	1.27
L	0.311	0.335	7.90	8.51
W	0.185	0.207	4.70	5.26

PRODUCT PORTFOLIO


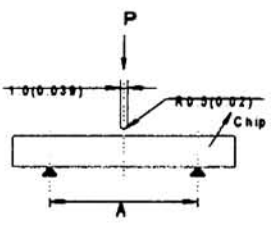
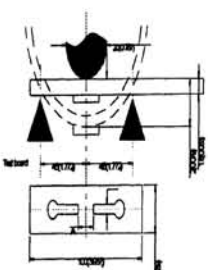
Dimension EIA size	0402	0603	0805	1206	1210	1812	2220	3220
Product types								
Transient Voltage Surge Suppressors (TVSS) 【JV type】	—————							
ESD Suppressors/Filters 【JE type】	—————							
High-speed Transient Voltage Surge Suppressors 【JH type】	———							
Automotive Transient Surge Suppressors 【JA type】				—————				
Monolithic SMD Voltage Surge Suppressors 【CH type】								———

working Voltage $V_{M(DC)}$	3.3	5.5	9	14	18	38	42	68	120	230	385
Product types											
Transient Voltage Surge Suppressors (TVSS) 【JV type】	—————										
ESD Suppressors/Filters 【JE type】	—————										
High-speed Transient Voltage Surge Suppressors 【JH type】		—————									
Automotive Transient Surge Suppressors 【JA type】					———						
Monolithic SMD Voltage Surge Suppressors 【CH type】				—————							

Reliability Test

Test Parameter	Test Condition	Performance Requirement
Humidity	Temp. : 40 ±2 °C Humidity : 90~95% RH Measure the variation of V_{1mA} at ambient temperature, 24 hours after completion. Duration:1000 Hrs	No visible damage $\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$
Loading Life	Temp. : 125 ±5 °C Applying the working voltage (V_{DC}) Measure the variation of V_{1mA} at ambient temperature, 24 hours after completion. Duration:500 Hrs	No visible damage $\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$
Damp Heat Loading	Temp. : 40 ±2 °C Humidity : 90~95% RH Applying the working voltage (V_{DC}) Measure the variation of V_{1mA} at ambient temperature, 24 hours after completion. Duration:500 Hrs	No visible damage $\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$
Temperature Cycle	Step 1: 125 ±5°C (30 min.) Step 2: Room Temp. (15 min.) Step 3: -40 °C (30 min.) Step 4: Room Temp. (15 min.) Duration:5 Cycles	No visible damage $\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$
Surge Life	Waveform: 8/20 or 10/1000 μ S Current: see catalog V-I Surge Lifetime Rating (2 times pulses) Duration:100 Pulses	No visible damage $\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$
Energy	Waveform: 10/1000 μ S $J = K * V_c * I_p * t$ Duration:1 Pulse	No visible damage $\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$

Reliability Test

Test Parameter	Test Condition	Performance Requirement																								
Solderability (I)	IR profile refers to "Recommended Soldering Condition"	Solder height more than 20% of chip thickness Chip shift distance less than 50% of width No short, open, ...etc. defect																								
Solderability (II)	Temp. : 235 ±5 °C Duration:5 ±1 S	All termination shall exhibit a continuous solder coating free from defects for a minimum of 75% of the critical area of any individual termination																								
Soldering Resistance	Temp. : 260 ±5 °C Duration:10 ±1 S	All termination shall exhibit a continuous solder coating free from body exposed																								
Terminal Strength	 <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Chip Size</th> <th>W=kgt</th> <th>Time(sec)</th> </tr> </thead> <tbody> <tr><td>0402</td><td>0.2</td><td rowspan="7" style="text-align: center;">30±5</td></tr> <tr><td>0603</td><td>0.3</td></tr> <tr><td>0805</td><td>0.6</td></tr> <tr><td>1206</td><td>1.0</td></tr> <tr><td>1210</td><td>1.0</td></tr> <tr><td>1812</td><td>1.0</td></tr> <tr><td>2220</td><td>1.0</td></tr> </tbody> </table>	Chip Size	W=kgt	Time(sec)	0402	0.2	30±5	0603	0.3	0805	0.6	1206	1.0	1210	1.0	1812	1.0	2220	1.0	The terminal electrode should not break off nor mechanical damaged						
Chip Size	W=kgt	Time(sec)																								
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0805	0.6																									
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2220	1.0																									
Bending Strength	 <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Chip Size</th> <th>A=mm(inches)</th> <th>P=kgt</th> </tr> </thead> <tbody> <tr><td>0402</td><td>0.5(0.020)</td><td>0.2</td></tr> <tr><td>0603</td><td>0.8(0.030)</td><td>0.3</td></tr> <tr><td>0805</td><td>1.4(0.055)</td><td>1.0</td></tr> <tr><td>1206</td><td>2.0(0.079)</td><td>2.0</td></tr> <tr><td>1210</td><td>2.0(0.079)</td><td>2.5</td></tr> <tr><td>1812</td><td>2.0(0.079)</td><td>2.5</td></tr> <tr><td>2220</td><td>2.0(0.079)</td><td>2.5</td></tr> </tbody> </table>	Chip Size	A=mm(inches)	P=kgt	0402	0.5(0.020)	0.2	0603	0.8(0.030)	0.3	0805	1.4(0.055)	1.0	1206	2.0(0.079)	2.0	1210	2.0(0.079)	2.5	1812	2.0(0.079)	2.5	2220	2.0(0.079)	2.5	The body should not be damaged by force applied on the top
Chip Size	A=mm(inches)	P=kgt																								
0402	0.5(0.020)	0.2																								
0603	0.8(0.030)	0.3																								
0805	1.4(0.055)	1.0																								
1206	2.0(0.079)	2.0																								
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2220	2.0(0.079)	2.5																								
Board Flexure Strength	 <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Chip Size</th> <th>A=mm(inches)</th> </tr> </thead> <tbody> <tr><td>0402</td><td>0.5(0.020)</td></tr> <tr><td>0603</td><td>0.8(0.030)</td></tr> <tr><td>0805</td><td>1.4(0.055)</td></tr> <tr><td>1206</td><td>2.0(0.079)</td></tr> <tr><td>1210</td><td>2.0(0.079)</td></tr> <tr><td>1812</td><td>2.0(0.079)</td></tr> <tr><td>2220</td><td>2.0(0.079)</td></tr> </tbody> </table>	Chip Size	A=mm(inches)	0402	0.5(0.020)	0603	0.8(0.030)	0805	1.4(0.055)	1206	2.0(0.079)	1210	2.0(0.079)	1812	2.0(0.079)	2220	2.0(0.079)	No mechanical damage shall be noticed even when the board is bent 2 mm (0.079 inch)								
Chip Size	A=mm(inches)																									
0402	0.5(0.020)																									
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