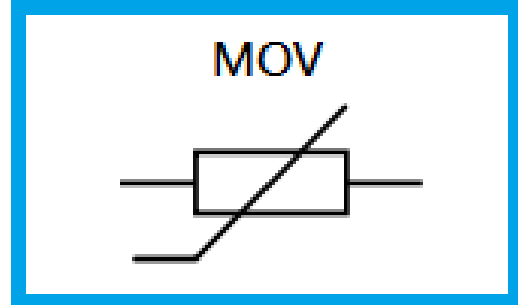


PMV3220 Series MOV Devices

Features

- Wide operating voltages ranging from 140 Vrms to 320 Vrms (180 Vdc to 410 Vdc).
- Fast response, instantly clamping the transient over voltage.
- High surge current handling capability.
- High energy absorption capability.
- Low clamping voltages, providing better surge protection.
- Low capacitance values, providing digital switching circuitry protection.
- High insulation resistance, preventing electric arcing to the adjacent devices or circuits.



Applications

- Universal Serial Bus (USB).
- Mobile communication.
- Computer/DSP product.
- Video and audio ports.
- Portable/Hand-Held Products.
- Data, Diagnostic I/O ports.

General Characteristics Definition

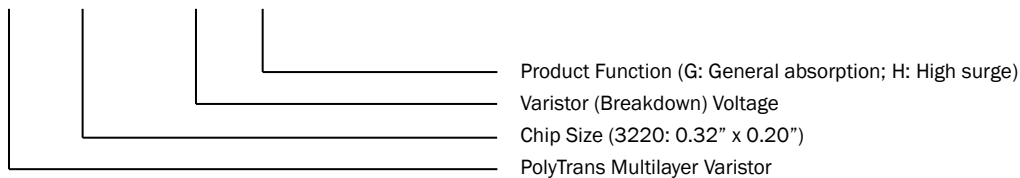
- Operating temperature: -40 ~ 85°C
- Storage temperature: -40 ~ 125°C

Material

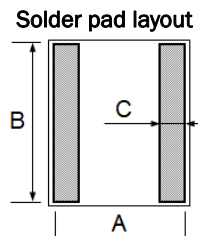
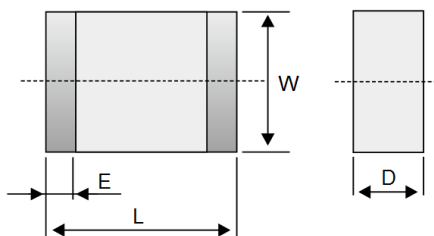
- Electrode: Ag/Ni/Sn
- Chip body: Zinc oxide

Part Number Code

PMV 3220 - □□□ □



Physical Dimensions



Symbol	Dimension (mm)
L	8.1±0.3
W	5.0+0.6/-0.3
D	4.5 max.
E	1.0±0.3
A	10.8 typ.
B	5.3 typ.
C	2.1 typ.

Note:

1. All dimensions are in millimeters.
2. No marking on the device.

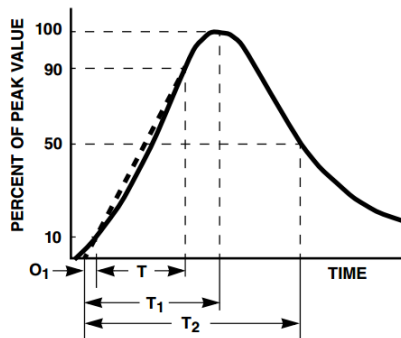
PMV3220 Series MOV Devices

Electrical Characteristics

Part Number	Max Allowable Voltage		Varistor Voltage $V_b @ 1 \text{ mA}$	Withstand Surge Current I_{PP} 8/20 μs	Max Clamping Voltage V_c		Typical Capacitance (pF)	Safety Certification
	V_{RMS}	V_{DC}			V	I		
	(V)	(V)	(V)	(A)	(V)	(A)		
PMV3220-221G	140	180	220	500	356	10	94	-
PMV3220-221H	140	180	220	800	356	10	110	-
PMV3220-241G	150	200	240	500	390	10	86	-
PMV3220-241H	150	200	240	800	390	10	90	-
PMV3220-271G	175	225	270	500	450	10	76	-
PMV3220-271H	175	225	270	800	450	10	<200	-
PMV3220-391G	250	330	390	500	647	10	42	-
PMV3220-391H	250	330	390	800	647	10	56	-
PMV3220-431G	275	350	430	450	705	10	39	-
PMV3220-431H	275	350	430	800	705	10	490	-
PMV3220-471G	300	385	470	450	775	10	35	-
PMV3220-471H	300	385	470	800	775	10	450	-
PMV3220-511H	320	410	510	1200	845	10	35	-

Note: The tolerance of varistor voltage is $\pm 10\%$

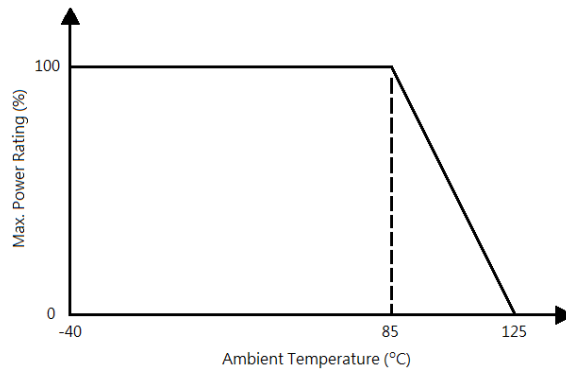
Peak Pulse Current Test Waveform



O_1 = Virtual Origin of Wave
 T = Time from 10% to 90% of Peak
 T_1 = Rise Time = $1.25 \times T$
 T_2 = Decay Time

Example - For an 8/20 ms current waveform
 $8 \mu\text{s} = T_1 = \text{Rise Time}$
 $20 \mu\text{s} = T_2 = \text{Decay Time}$

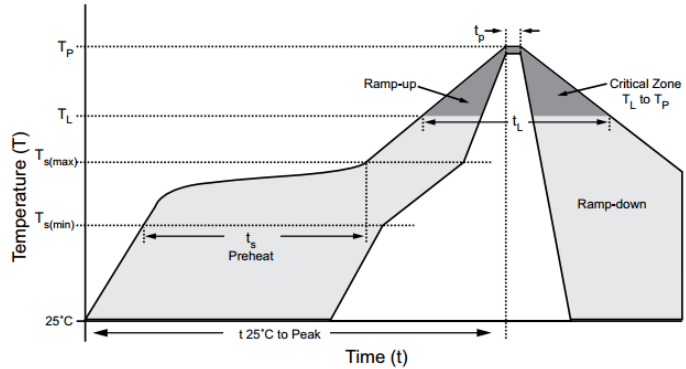
Power Derating Curve



PMV3220 Series MOV Devices

Lead Free Reflow Soldering Recommendations

Preheat	
- Temperature Min (T_{s_min})	150°C
- Temperature Max (T_{s_max})	200°C
- Time (T_{s_min} to T_{s_max})	60-180 seconds
- Average Ramp-Up Rate	1~3°C/second
Peak Temperature	260°C max.
Time within 5°C of actual Peak Temperature (t_p)	40 seconds max.
Ramp-Down Rate	6 °C /second max.



Note: If the wave soldering temperatures exceed the recommended profile, devices may not meet the performance requirements.

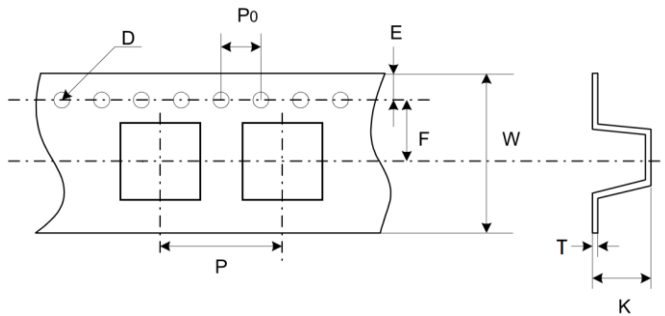
Reliability Test

Environmental Ratings										
Test Parameter	Test Condition / Description	Performance Requirements								
Dry Heat Loading	The specimen shall be applied continuously the maximum allowable voltage at the specified conditions for specified period and then stored at room temperature and normal humidity over 2 hours. Thereafter, the change of V_b and mechanical damage shall be examined. Ambient temp: 85±2°C / Period: 1000±24hours	$\Delta V_b/V_b \leq 10\%$								
High Temp Storage	In a dry oven without load. Ambient temp: 125±2°C / Period: 1000±24hours	$\Delta V_b/V_b \leq 10\%$								
Damp Heat/ Humidity Loading	The specimen shall be applied continuously the maximum allowable voltage at the specified conditions for specified period and then stored at room temperature and normal humidity over 2 hours. Thereafter, the change of V_b and mechanical damage shall be examined. Ambient temp: 40±2°C, 90~95%RH / Period: 1000±24hours	$\Delta V_b/V_b \leq 10\%$								
Temperature Cycle	Condition the specimen to each temperature from step 1 to step 4 in this order for the period shown in the table of specifications. The change of V_b and mechanical damage shall be examined after 2 hours. <table border="1" style="margin-left: 20px;"> <tr> <td>Step 1</td> <td>-40±3°C / 30min.</td> </tr> <tr> <td>Step 2</td> <td>Room temp / 15min.</td> </tr> <tr> <td>Step 3</td> <td>85±2°C / 30min.</td> </tr> <tr> <td>Step 4</td> <td>Room temp / 15min.</td> </tr> </table>	Step 1	-40±3°C / 30min.	Step 2	Room temp / 15min.	Step 3	85±2°C / 30min.	Step 4	Room temp / 15min.	No Visible damage $\Delta V_b/V_b \leq 10\%$
Step 1	-40±3°C / 30min.									
Step 2	Room temp / 15min.									
Step 3	85±2°C / 30min.									
Step 4	Room temp / 15min.									
Low Temp Storage	In a cooling chamber without load. Ambient temp: -40±2°C / Period: 1000±24hours	$\Delta V_b/V_b \leq 10\%$								

PMV3220 Series MOV Devices

Packaging Information

Part Number	Carrier Material	Quantity (EA/Roll)	Reel Diameter (mm)
PMV3220 Series	Plastic	1000	178.0±1.0 (7" Plastic Reel)



Symbol	Dimension (mm)
P	8.0±0.1
P0	4.0±0.05
D	1.50±0.1
E	1.75±0.1
F	7.5±0.05
W	16.0±0.2
T	0.30±0.05
K	3.5±0.05