



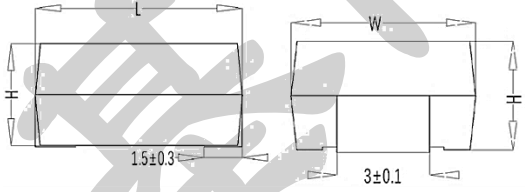
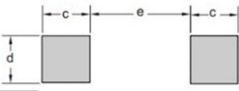


	型号 TYPE	Varistor SMD 5A□□□	品种 MODEL	页次 PAGE	1/7
参照文件 CITATION		日期 DATE	Nov. 22, 2022	版本 REV.	D09
主题 SUBJECT	品质认证与结构 QUALITY APPROVAL and STRUCTURE				

1. 安规认证一览 SAFETY STANDARDS APPROVAL

标准号 Standard No.	UL 1449 4th
档案号 File No.	E315429
5A125-5A350	Approved

2. 结构图 STRUCTURE

项次 No.	项目 ITEM	描述 DESCRIPTION						
2.1	主要材质 Main Material	<p>压敏电阻(MOV)的主要材料为氧化锌·利用氧化物烧结工艺制造·相当于多个背靠背的 PN 结串联·当雷击电压跨在 MOV 的两引线上时·MOV 电阻减小形成旁路使雷击电流通过</p> <p>Metal Oxide Varistors (MOVs) are two-leaded, surface mounted components. Manufactured mainly from sintered zinc oxides and schematically equivalent to two back-to-back PN junctions, MOVs shunt surge currents by decreasing their resistance as transient voltage is applied.</p>						
2.2	包装类型 Package Type	环氧树脂注塑成型。 Molded epoxy resin.						
2.3	打印 Marking	 ---- Ceramate Logo 台基标志  ---- Element Size MOV 尺寸  ---- Maximum Continuous AC Operating Voltage (MCOV) 最大连续交流工作电压 						
2.4	外观 Appearance	无污垢和裂纹·标记应清晰。 Without dirt and crack, marking should be clear.						
2.5	零件尺寸 Dimensions	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>L</td> <td>8.2±0.3</td> </tr> <tr> <td>W</td> <td>6.3±0.3</td> </tr> <tr> <td>H</td> <td>3.8±0.3</td> </tr> </table> <p style="text-align: center;">Unit: mm</p>	L	8.2±0.3	W	6.3±0.3	H	3.8±0.3
L	8.2±0.3							
W	6.3±0.3							
H	3.8±0.3							
2.6	焊盘布局 Soldering Pad Layout	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>c</td> <td>2.8</td> </tr> <tr> <td>d</td> <td>3.5</td> </tr> <tr> <td>e</td> <td>4.5</td> </tr> </table>	c	2.8	d	3.5	e	4.5
c	2.8							
d	3.5							
e	4.5							

3. ELECTRICAL CHARACTERISTICS 电气特性

项次 No.	項目 ITEM	性能要求 PERFORMANCE	测试条件 TEST METHODS
3.0	标准条件 Standard Conditions		除另有指明外，所有的测试都于下述环境条件下进行： 温度 20~35 °C 相对湿度 45~85 % Unless otherwise specified, all tests are made under environmental conditions as given below: Temperature: 20~35°C Relative humidity: 45~85 % RH
3.1	最大连续工作电压 Maximum Continuous Operating Voltage (MCOV)	AC : *(2) V _{rms} DC : *(2) V	可连续施加的最大交流正弦波(RMS)或直流电压。 Maximum continuous AC sine wave(RMS) or DC voltage which may be applied.
3.2	压敏电压 Varistor Voltage	V _{0.1mA} : *(2) V	将压敏电阻跨接至已调整为恒流 0.1mA 的可变电压直流电源,施加 10ms 至 500ms 时间内量测电压值。 Varistors be connected to a variable voltage source adjusted to maintain a current of 0.1mA DC applied between 10 ms and 500 ms and the voltage across the varistor measured.
3.3	压敏电压 温度系数 Varistor Voltage Temperature Coefficient	-0.05 ~ +0.05 %/°C	$\frac{V_{0.1mA} \text{ at } 105^{\circ}\text{C} - V_{0.1mA} \text{ at } 25^{\circ}\text{C}}{V_{0.1mA} \text{ at } 25^{\circ}\text{C}} \times \frac{1}{80} \times 100(\%/^{\circ}\text{C})$
3.4	最大钳制电压 Max. Clamping Voltage	*(2) V at *(2) A	以 8/20μs 波形施加规定的冲击电流时,压敏电阻两端的最大电压。 Peak voltage across the varistor with a specified peak impulse current of 8x20μs waveform.
3.5	额定功率 Rated Power	*(2) W	压敏电压变化率±10%时，在 105±2°C可负载 1000 小时的最大 50~60Hz 功率。 Maximum 50~60Hz power which may be loaded for 1,000 hrs at 105±2°C with the varistor voltage change of less than ±10%.
3.6	复合冲击波 · IEC 61000-4-5: 2014 Combination Impulse Wave Uoc (1.2 / 50 us) / Icw (8 / 20 us)	*(2) kV / *(2) kA	依照 IEC 61000-4-5: 2014 -测试波形：复合波； 开路电压(Uoc)：1.2×50 s 短路电流(Icw)：8x20 s -浪涌次数(对各耦合路径)：应分别在 0°, 90°, 180° 与 270° 相角施加正、负极性各 5 次； -连续脉冲间的时间间隔：1 分钟或更短； In accordance with IEC 61000-4-5: 2014 - test waveform: combination wave; - Open Circuit Voltage (Uoc) : 1.2×50 s - Short Circuit Current (Icw) : 8x20 s - number of impulses (for each coupling path): five positive and five negative impulses each at 0°, 90°, 180° and at 270°; - time between successive impulses: 1 min or less.
3.7	最大放电电流 Maximum Discharge Current (I _{max})	*(2) A	压敏电压变化率小于±10%,施加 1 次 8x20μs 电流波形浪涌,可通过压敏电阻的电流峰值。 Peak value of the current through the varistor having a current waveshape of 8x20μs where the varistor voltage change less than ±10% after applied one time.
3.8	浪涌能量 Energy	*(2) Joule	压敏电压变化率小于±10% · 施加一次 10×1000us 浪涌 · 压敏电阻吸收的最大能量。 The max. energy absorbed with the varistor voltage change less than ±10% when one impulse current waveform 10x1000μs is applied.
3.9	典型电容值 (参考值) Typical Capacitance (Reference)	*(2) pF	电容值应在 1 kHz±10% · 最大 1 Vrms · 0V 偏压与 20±2°C下进行量测。 Capacitance shall be measured at 1 kHz ±10%, 1 Vrms max. 0V bias and 20±2°C

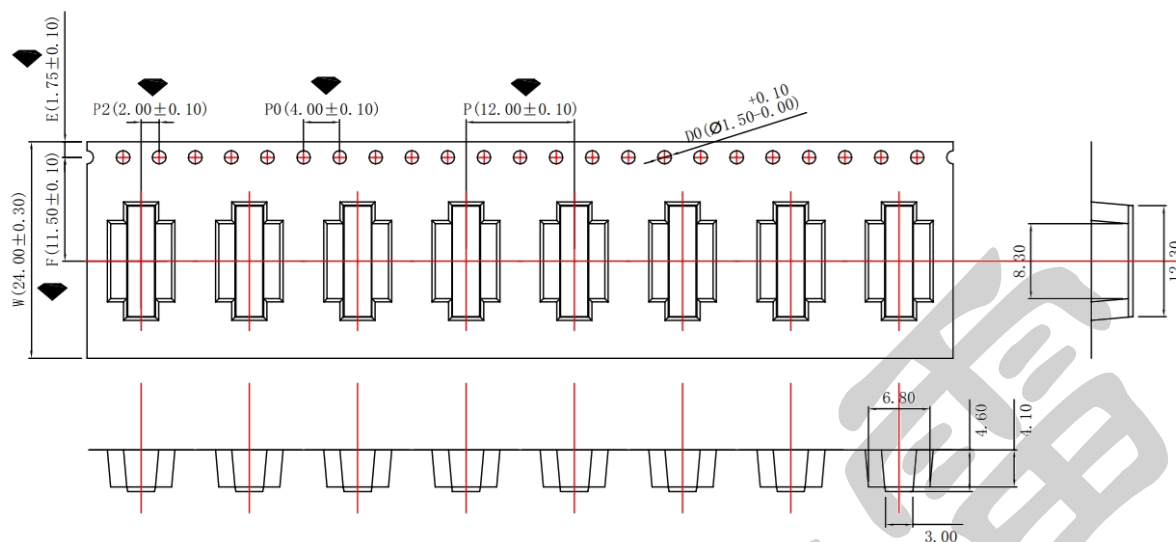
*(2) 参照第 3 页 See Page 3

主題 SUBJECT	电气特性 ELECTRICAL CHARACTERISTICS
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型号 PART NUMBER	最大连续工作电压 Maximum Continuous Operating Voltage		压敏电压 Varistor Voltage	钳位电压 Clamping Voltage		额定功率 Rated Wattage	复合冲击波 Combination Impulse Wave	最大放电电流 Maximum Discharge Current	浪涌能量 Energy	典型电容值 Typical Capacitance
	MCOV		Vn	Vp	Ip		Uoc (1.2 / 50 us) /Icw (8 / 20 us)	I _{max}		
	(Vac)	(Vdc)	(V)	(V)	(A)	(W)	(kV) / (kA)	(A, 8/20us)	(Joule)	(pf)
5A130	130	170	180~220	355	5	0.5	2kV/1kA	1200	8.5	200
5A140	140	180	198~242	380					9.0	180
5A150	150	200	216~264	415					10.5	170
5A125	175	225	243~297	475					11	150
5A190	190	250	270~330	525					12	150
5A210	210	275	297~363	570					13	150
5A230	230	300	324~396	620					16	115
5A250	250	320	351~429	675					17	105
5A275	275	350	387~473	745					20	95
5A300	300	385	423~517	810					21	90
5A320	320	410	459~561	845					22.5	85
5A350	350	450	504~616	930					24	80

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主題 SUBJECT	編帶尺寸 TAPE DIMENSIONS				

4. 編帶尺寸 TAPE DIMENSIONS



- 4.1. 每 13" 卷轴包装长度 12.576M ; Packing length per 13" reel : 12.576 Meters.
- 4.2. 每 13" 卷轴可装 1000pcs 零件 ; Component load per 13" reel : 1000pcs.
- 4.3. 每 2 卷轴装一盒可装 2000pcs ; 2 reels per inner box ; 2000pcs
- 4.4. 每 10 卷轴装一箱可装 10,000pcs ; 10 reels per full carton ; 10,000pcs

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主题 SUBJECT	可靠性 RELIABILITY				

5. 环境特征 ENVIRONMENTAL CHARACTERISTICS

项次 No.	项目 ITEM	性能要求 PERFORMANCE	测试条件 TEST METHODS
5.1	气候顺序 Climate Sequence	$\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$ $(\Delta V_{0.1mA} / V_{0.1mA} \leq \pm 10\%$ for 05D or 5A series) No visible Damage Insulation resistance $\geq 1M\Omega$ 无可见损伤 绝缘电阻 $\geq 1M\Omega$	IEC 60068-2-2, Test B _a 干热 : 105±2°C /16hrs Dry heat: 105±2°C /16hrs IEC 60068-2-30, Test D _b 循环湿热 (第 1 循环) Damp heat, cyclic(first cycle): 55±2°C /24hrs, 93±3%RH IEC 60068-2-1, Test A _a 寒冷 : -40±2°C /2hrs Cold: -40±2°C /2hrs IEC 60068-2-30, Test D _b 循环湿热 (剩余的 5 个循环): Damp heat, cyclic(remaining 5 cycles): 55±2°C / 25±2°C, 93±3%RH 24hrs/循环 24hrs/cycle
5.2	湿热,稳态 Damp Heat, Steady State	$\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$ $(\Delta V_{0.1mA} / V_{0.1mA} \leq \pm 10\%$ for 05D or 5A series) No visible Damage Insulation resistance $\geq 1M\Omega$ 无可见损伤 绝缘电阻 $\geq 1M\Omega$	IEC 60068-2-78, Test C _a 温度 : 40±2°C 湿度 : 93±3%RH 持续时间 : 56 days Temperature : 40±2°C Humidity : 93±3%RH Duration : 56 days
5.3	温度快速变化 Rapid Change in Temperature	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ $(\Delta V_{0.1mA} / V_{0.1mA} \leq \pm 5\%$ for 05D or 5A series) No visible Damage 无可见损伤	IEC 60068-2-14, Test N _a T _A =-40°C; T _B = + 105°C 持续时间: 30 分钟/阶段 总数: 5 个循环 Duration : 30 minutes/step Total : 5 cycles
5.4	干热,负载 Dry Heat, Loading	$\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$ $(\Delta V_{0.1mA} / V_{0.1mA} \leq \pm 10\%$ for 05D or 5A series) No visible Damage Insulation resistance $\geq 10M\Omega$ 无可见损伤 绝缘电阻 $\geq 10M\Omega$	IEC 60068-2-2, Test B 温度: 105°C 持续时间: 1,000 hrs 施加电压: 最大连续工作电压(MCOV) Temperature : 105°C Duration : 1,000 hrs Apply voltage: Max. allowable voltage
5.5	湿热,负载 Damp Heat, Loading	$\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$ $(\Delta V_{0.1mA} / V_{0.1mA} \leq \pm 10\%$ for 05D or 5A series) No visible Damage Insulation resistance $\geq 1M\Omega$ 无可见损伤 绝缘电阻 $\geq 1M\Omega$	IEC 60068-2-78, Test C _a 温度: 40±2°C 湿度: 93±3%RH 持续时间: 56 days 施加电压: 10%最大连续 DC 工作电压 Temperature : 40±2°C Humidity : 93±3%RH Duration : 56 days Apply voltage : 10% of Max. allowable dc voltage

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主題 SUBJECT	可靠性 RELIABILITY				

6. 机械特性 MECHANICAL CHARACTERISTICS

项次 No.	項目 ITEM	性能要求 PERFORMANCE	测试条件 TEST METHODS
6.1	振动 Vibration	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ $(\Delta V_{0.1mA} / V_{0.1mA} \leq \pm 5\%$ for 05D or 5A series) No visible Damage 无可见损伤	IEC 60068-2-6, Test F _c Method B4 频率范围 : 10~55Hz 振幅 : 0.75mm or 98 m/s ² 持续时间 : 6 hrs(3 x 2hrs) 脉冲 : 正弦波 Frequency range : 10~55Hz Amplitude : 0.75mm or 98 m/s ² Duration : 6 hrs(3 x 2hrs) Pulse : sine wave
6.2	可焊性 Solderability	95% of the immersed portion covered with solder 浸渍部分 95%被焊锡覆盖	IEC 60068-2-20, Test T _a Method 1 焊锡温度 : 245±5°C 浸渍时间 : 3±0.5 sec Solder temp. : 245±5°C Immersed time : 3±0.5 sec
6.3	耐焊接热 Resistance to Soldering Heat	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ $(\Delta V_{0.1mA} / V_{0.1mA} \leq \pm 5\%$ for 05D or 5A series) No visible Damage 无可见损伤	IEC 60068-2-20, Test T _b Method 1A 焊锡温度 : 260±5°C 浸渍时间 : 10±1 sec Solder temp. : 260±5°C Immersed time : 10±1 sec
6.4	引出端强度, 张力 Robustness of Terminations, Tensile	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ $(\Delta V_{0.1mA} / V_{0.1mA} \leq \pm 5\%$ for 05D or 5A series) No break of solder joint, no wire break 焊接点与引出端无破损	IEC 60068-2-21, Test U _a 1 力 : 0.6 and 0.8 φmm 线径施加 1 kgf 1.0 φmm 线径施加 2 kgf 持续时间 : 10 sec Force: 1 kgf for 0.6 and 0.8 φmm wire 2 kgf for 1.0 φmm wire Duration: 10 sec
6.5	冲击 Shock	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ $(\Delta V_{0.1mA} / V_{0.1mA} \leq \pm 5\%$ for 05D or 5A series) No visible Damage 无可见损伤	IEC 60068-2-27, Test E _a 脉冲波形 : 半正弦波 加速度 : 490 m/s ² 脉冲持续时间 : 11 ms 3 x 6 次冲击 Pulse shape: half sine Acceleration: 490 m/s ² Pulse duration: 11 ms 3 x 6 shocks

7. 技术术语 TECHNICAL TERM

项次 No.	項目 ITEM	性能要求 PERFORMANCE	测试条件 TEST METHODS
7.1	工作温度范围 Operating Temperature Range	-40°C to +105°C	额定值不会降低的工作温度范围。 Operating temperature range without derating.
7.2	储存温度范围 Storage Temperature Range	-40°C to +125°C	无施加电压的储存温度范围。 Storage temperature range without voltage applied.
7.3	脉冲响应时间 Transient Response Time	< 50 ns	施加浪涌冲击后,压敏电阻“导通”传导起作用的延迟时间。 Time lag between application of surge and varistor's "turn-on" conduction action.
7.4	绝缘电阻 Insulation Resistance	10,000 M Ω minimum	两引线短接后与压敏电阻表面间的最小电阻值。 Minimum resistance between shorted terminals and varistor surface.
7.5	介电耐压试验 Hipot test	$\geq 2500V_{Ac}$	两引线短接后与压敏电阻表面间可以施加 1 分钟的最小电压值。 Minimum voltage applied for one minute between shorted terminals and varistor surface.