

规格书

SPECIFICATION FOR APPROVAL

产品名称： 汽车抗浪涌贴片电阻 ASWR 系列

产品规格： 全系列

制作	核准	审核
马鑫	胡梓秋	方齐炜

供应商：深圳市美隆电子有限公司

地址：深圳市福田区华强北路华强广场 A 座 16 楼

规格如有更改，恕不另行通知

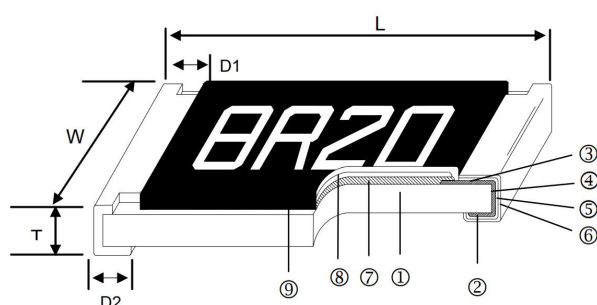
2025/A

| 汽车抗浪涌贴片电阻 ASWR 系列

摘要 Resume >>>

- Superior Anti-Surge Voltage performance. 优越的抗浪涌电压特性
- Automotive electronics 汽车电子
- Automatic Equipment Controller 自动化设备控制器
- Medical Equipment 医疗设备
- Outdoor Electronic Applications 户外电子应用
- AEC-Q200 Compliance 符合 AEC-Q200 要求

结构图 Construction >>>



- ① Alumina Substrate 陶瓷基板
- ② Bottom Electrode 背导电极
- ③ Top Electrode 正导电极
- ④ Edge Electrode 侧导电极
- ⑤ Barrier Layer 电镀介质层
- ⑥ External Electrode 外部端电极
- ⑦ Resistor Layer 电阻层
- ⑧ Overcoat 密封层
- ⑨ Marking 丝印

尺寸 Dimensions >>>

类型 Type		0402	0603	0805	0805 (1/2W)	1206
尺寸 Dimension	L(mm)	1.00±0.05	1.60±0.10	2.00±0.10	2.00±0.10	3.10±0.10
	W(mm)	0.50±0.05	0.80±0.10	1.25±0.10	1.25±0.10	1.55±0.10
	T(mm)	0.35±0.05	0.45±0.10	0.50±0.10	0.55±0.10	0.55±0.10
	D1(mm)	0.20±0.10	0.30±0.20	0.35±0.20	0.35±0.20	0.50±0.25
	D2(mm)	0.20±0.10	0.30±0.20	0.40±0.20	0.40±0.20	0.50±0.20
类型 Type		1206(3/4W)	1210	2010	2512	2512(2W)
尺寸 Dimension	L(mm)	3.10±0.10	3.10±0.10	5.00±0.10	6.35±0.10	6.35±0.20
	W(mm)	1.55±0.10	2.60±0.15	2.50±0.15	3.10±0.15	3.15±0.15
	T(mm)	0.55±0.10	0.55±0.10	0.55±0.10	0.55±0.10	0.60±0.10
	D1(mm)	0.60±0.25	0.50±0.25	0.60±0.25	0.60±0.25	0.80±0.25
	D2(mm)	0.55±0.25	0.50±0.20	0.50±0.20	0.50±0.20	0.60±0.30

型号名称 Part Numbering >>>

ASWR	04	3216(1206)	L1001	J	T	U*
Product Type 产品型号	Production line code 产线代码	Resistor Size 电阻规格	Resistance 阻值	Resistance Tolerance 阻值公差	Packing Code 包装形式	High Power 升功率
ASWR : 汽车抗浪涌贴片电阻	04	1005 (0402) 1608 (0603) 2012 (0805) 3216 (1206) 3225 (1210) 5025 (2010) 6432 (2512)	±5%及以上 L105:1MΩ L102:1KΩ L1R0:1Ω	J=±5% K=±10% M=±20%	T:Taping Reel T: 编带 B: Bulk B: 散装	S:2W N:1W Q:3/4W U:1/2W V:1/4W W:1/8W

◆U* : High Power 升功率 (非升功率不加备注)

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标准规格表 Stand Electrical Specifications>>>-----

Item Type 项目 型号	Power Rating 额定功率	Max. Operating Voltage 最大工作电压	Max. Overload Voltage 最大负载电压	Resistance Range 阻值范围			TCR 温度系数 (PPM/°C)
				±5%	±10%	±20%	
0402	1/5W	50V	100V	1Ω-1MΩ	1Ω-1MΩ	1Ω-1MΩ	1Ω≤R≤20Ω:±300 22Ω≤R≤1MΩ:±100
0603	1/8W	50V	100V	1Ω-20MΩ	1Ω-20MΩ	1Ω-20MΩ	10Ω≤R≤270Ω:±200 300Ω≤R≤1MΩ:±100
0805	1/4W	150V	300V	1Ω-20MΩ	1Ω-20MΩ	1Ω-20MΩ	1Ω≤R≤270Ω:±200 300Ω≤R≤20MΩ:±100
1206	1/3W	200V	400V	1Ω-20MΩ	1Ω-20MΩ	1Ω-20MΩ	1Ω≤R≤20Ω:±200 22Ω≤R≤20MΩ:±100
1210	1/2W	200V	400V	1Ω-20MΩ	1Ω-20MΩ	1Ω-20MΩ	1Ω≤R≤20Ω:±200 22Ω≤R≤20MΩ:±100
2010	3/4W	400V	800V	1Ω-20MΩ	1Ω-20MΩ	1Ω-20MΩ	1Ω≤R≤20Ω:±200 22Ω≤R≤20MΩ:±100
2512	1.5W	500V	1000V	1Ω-20MΩ	1Ω-20MΩ	1Ω-20MΩ	1Ω≤R≤20Ω:±200 22Ω≤R≤20MΩ:±100

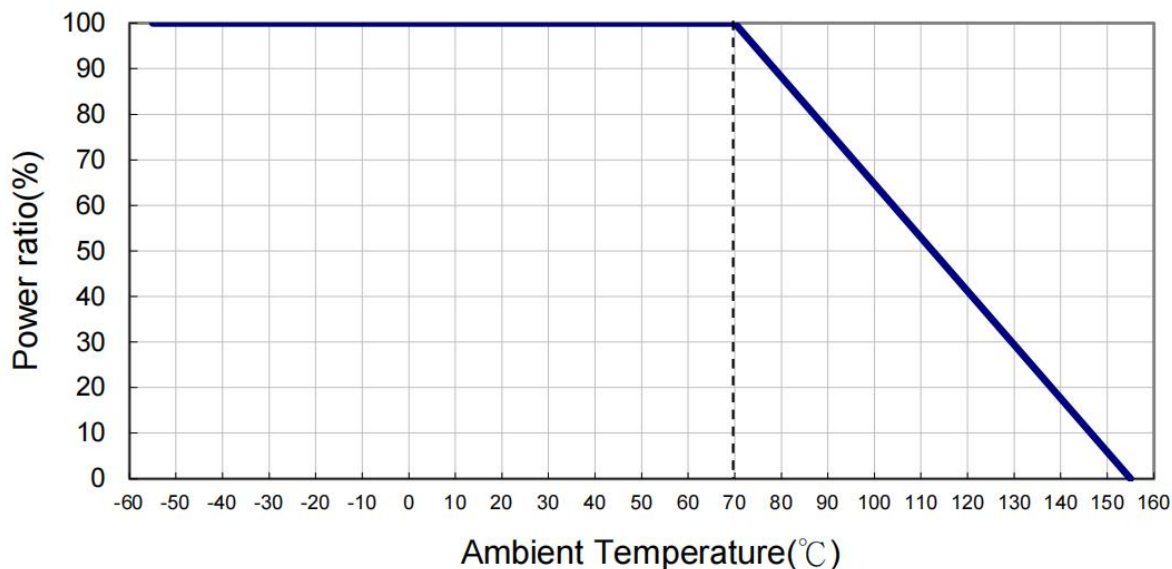
升功率规格表 High Power Rating Electrical Specifications >>>-----

Item Type 项目 型号	Power Rating 额定功率	Max. Operating Voltage 最大工作电压	Max. Overload Voltage 最大负载电压	Resistance Range 阻值范围			TCR 温度系数 (PPM/°C)
				±5%	±10%	±20%	
0603	1/4W 1/3W	75V	150V	10Ω-1MΩ	10Ω-1MΩ	10Ω-1MΩ	10Ω≤R≤270Ω:±200 300Ω≤R≤1MΩ:±100
0805	2/5W	150V	300V	1Ω-20MΩ	1Ω-20MΩ	1Ω-20MΩ	1Ω≤R≤270Ω:±200 300Ω≤R≤1MΩ:±100
	1/2W*	400V	600V				
1206	1/2W	200V	400V	1Ω-1MΩ	1Ω-1MΩ	1Ω-1MΩ	1Ω≤R≤20Ω:±200 22Ω≤R≤1MΩ:±100
	3/4W*	500V	1000V				
1210	3/4W 1W	200V	400V	1Ω-1MΩ	1Ω-1MΩ	1Ω-1MΩ	1Ω≤R≤20Ω:±200 22Ω≤R≤1MΩ:±100
2010	1W 1.25W	400V	800V	1Ω-1MΩ	1Ω-1MΩ	1Ω-1MΩ	1Ω≤R≤20Ω:±200 22Ω≤R≤1MΩ:±100
2512	2W*	500V	1000V	1Ω-220KΩ	1Ω-220KΩ	1Ω-220KΩ	1Ω≤R≤10Ω:±350 11Ω≤R≤200KΩ:±100

◆Operating Temp.Range 操作温度范围 : 0402 ~ 2512 : -55 ~ 155°C

◆*: Ultra High Power: double side printed resistor element 超高功率 : 双面印刷电阻器元件

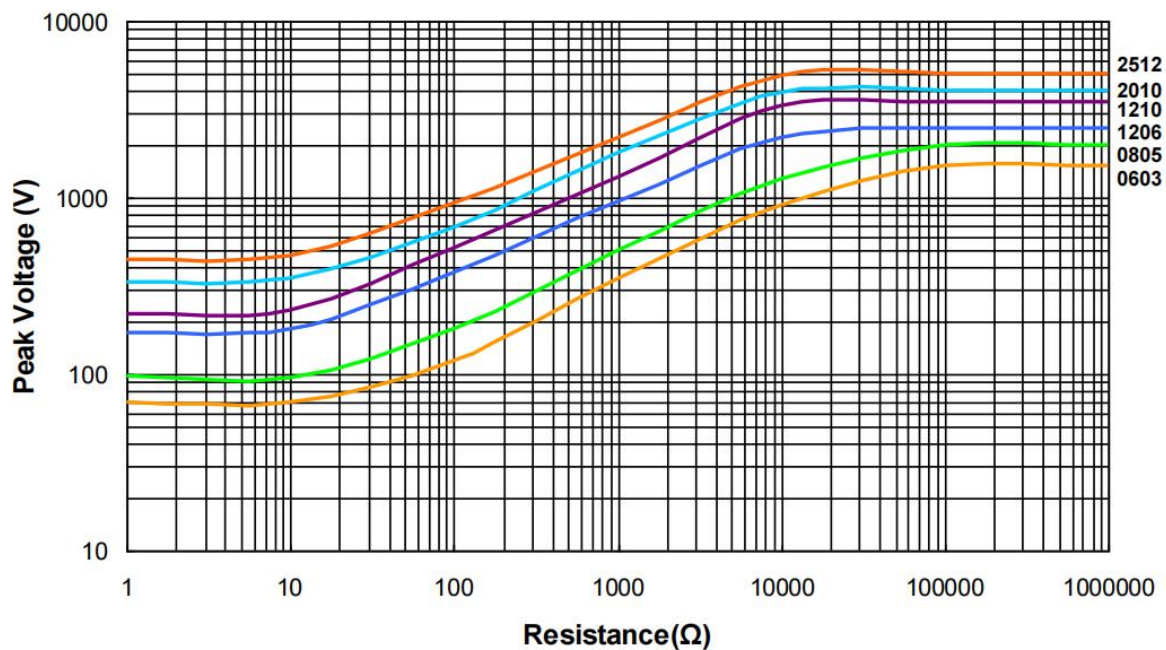
功率衰减曲线图 Derating Curve>>>



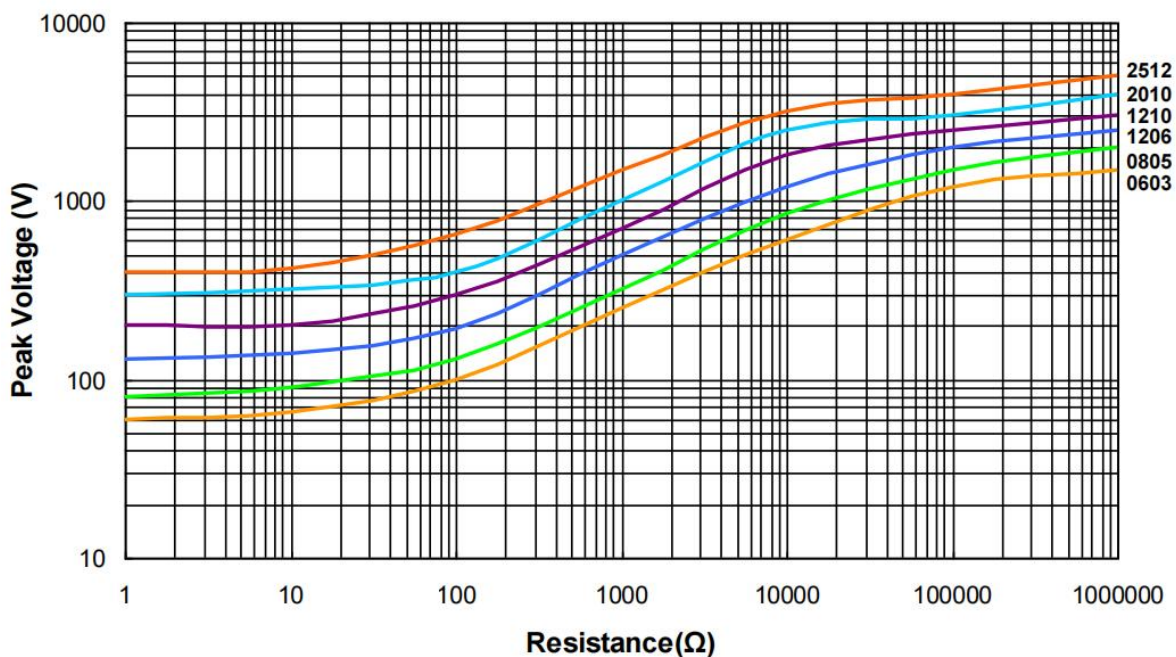
雷电冲击 Lightning Surge>>>

Resistors are tested in accordance with IEC 60115-1 using both 1.2/50us and 10/700 pulse shapes. The limit of acceptance is a shift in resistance of less than 1% from the initial value.

SWR Series 1.2/50us Lightning Surge



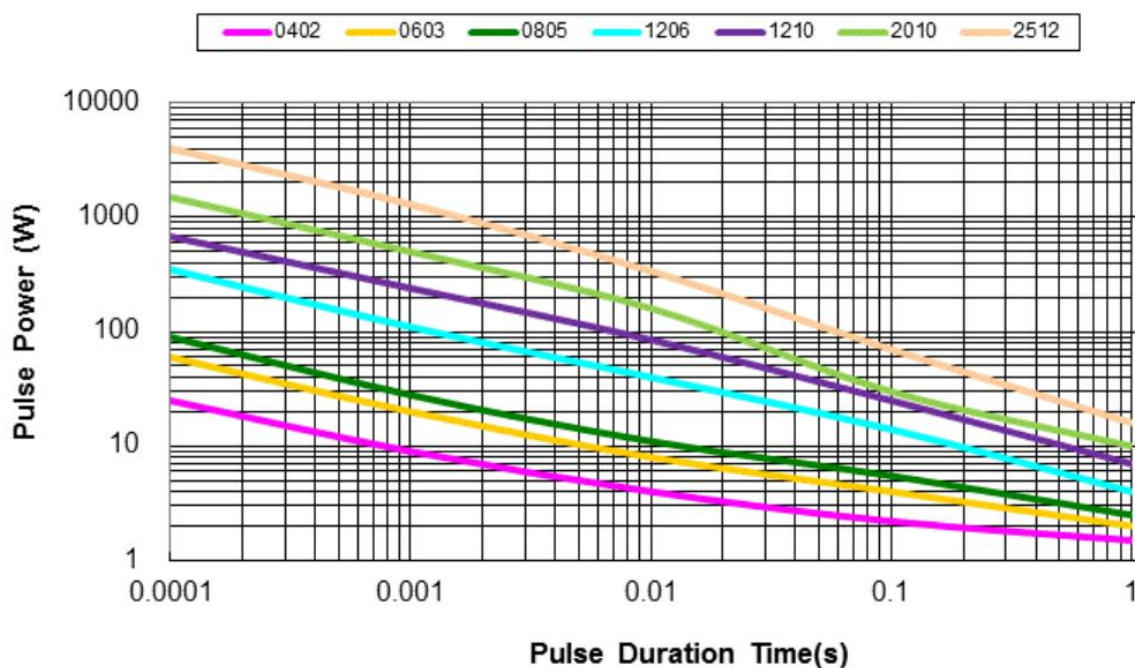
SWR Series 10/700us Lightning Surge



单脉冲曲线图 Single Pulse Power>>>-----

The limit of acceptance was a shift in resistance of less than 1% from the initial value. The power applied was subject to the restrictions of the maximum permissible impulse voltage graph shown.

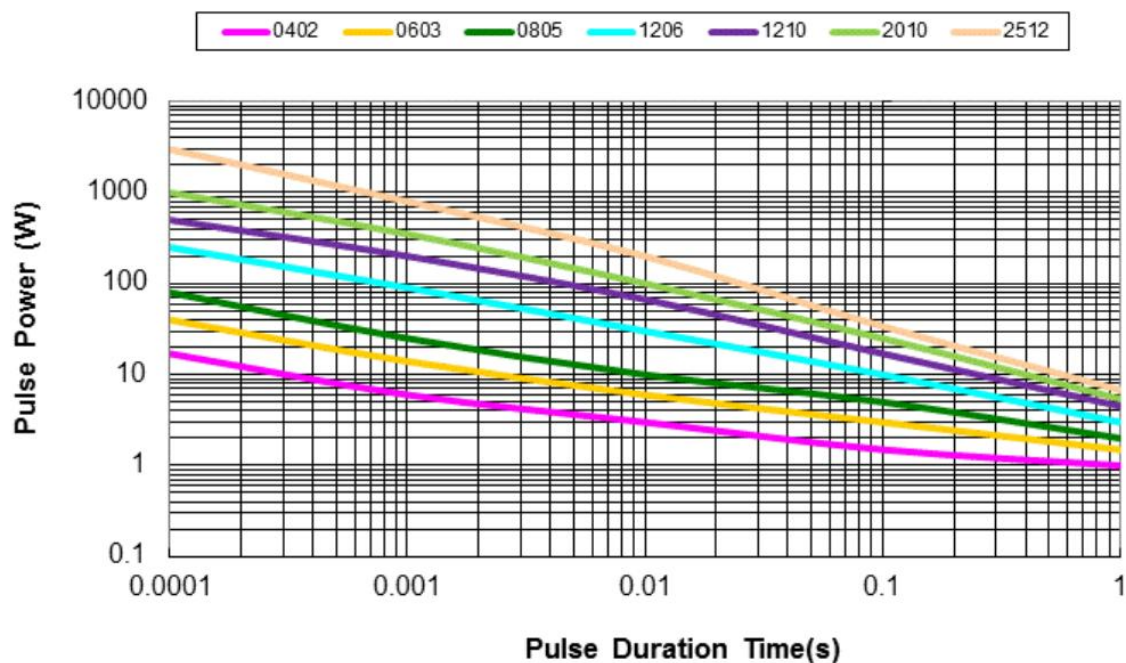
SWR Series Single Pulse(100 Ohm)



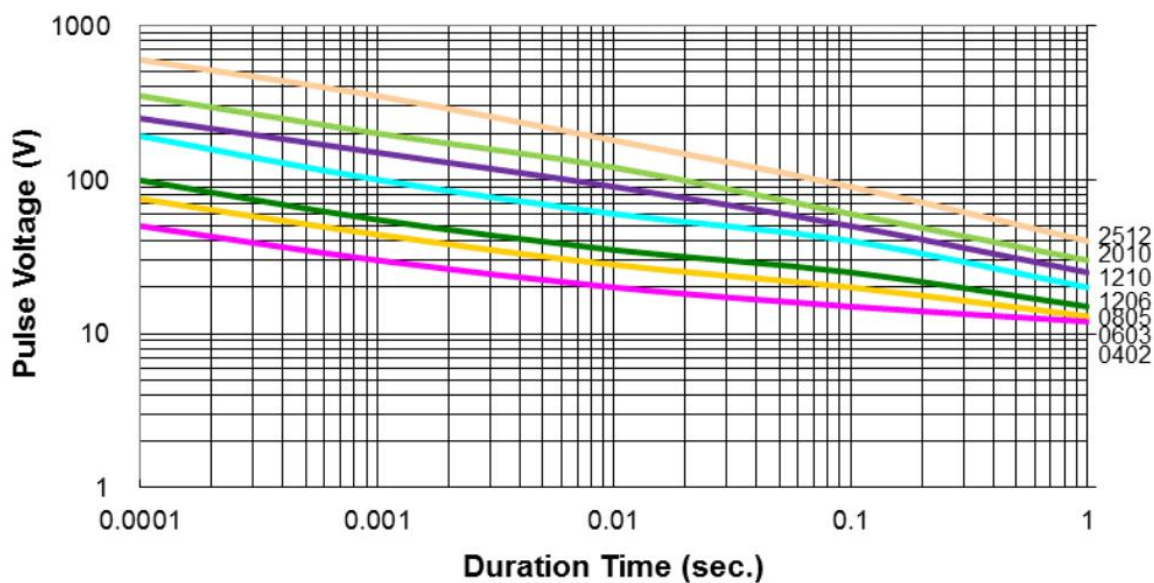
连续脉冲 Continuous Pulse >>>-----

The continuous load graph was obtained by applying repetitive rectangular pulses where the pulse period was adjusted so that the average power dissipated in the resistor was equal to its rated power at 70 °C. Again the limit of acceptance was a shift in resistance of less than 1% from the initial value.

SWR Series Continuous Pulse(100 Ohm)



SWR Series Pulse Voltage(100 Ohm)



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信赖性试验项目 Environmental Characteristics >>>-----

Item 项目	Requirement 条件	Test Method 测试方法
	±5% 及以上	
Temperature Coefficient (T.C.R.) 温度系数(T.C.R.)	As Spec. 参考规格表	At 25°C / -55°C and 25°C / +125°C, 25°C is the reference temperature 25°C为参考温度
Short Time Overload 短时间过负载	±(1.0%+0.05Ω)	RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds 额定电压的 2.5 倍或最大负载电压 5 秒
Insulation Resistor 绝缘阻抗	≥10G	Max.Overload voltage for 1 minute 施加最大负载电压 1 分钟
Operational Life 负载寿命	±(3.0%+0.05Ω)	TA=125°C at derated power. Measurement at 24±4 hours after test conclusion. 125°C温度中施加降额电压, 1000 小时, 在试验结束后的 24±4 小时进行测量。
Biased Humidity 偏置湿度	±(3.0%+0.05Ω)	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度 85 °C, 湿度 85% 的条件下放置 1000 小时。 注意：指定条件：工作功率的 10%，试验结束后 24±4 小时内进行测试。
High Temperature Exposure(Storage) 高温储存	±(1.0%+0.05Ω)	1000 hrs. @ T=155°C. Unpowered. Measurement at 24±4 hours after test conclusion 155°C下放置 1000h,不加载功率,试验结束 24±4 小时后进行测试。
Board Flex 弯曲	±(1.0%+0.05Ω)	Bending once for 60 seconds 2010, 2512 sizes: 2mm Other sizes: 3mm 弯曲一次,持续 60 秒, 2010, 2512 尺寸: 2mm, 其他尺寸: 3mm
Solderability 焊锡性	95%min.coverage 导体爬锡面积大于 95%	245±5°C for 3 seconds 245±5°C锡炉中, 持续 3 秒
Resistance to Soldering Heat 抗焊接热	±(1.0%+0.05Ω)	260±5°C for 10 seconds 260±5°C锡炉中, 持续 10 秒
Voltage Proof 耐电压	No breakdown or flashover 无击穿或跳火现象	1.42 times Max.Operating Voltage for 1 minute 最大操作电压*1.42 倍, 持续 1 分钟
Leaching 溶蚀测试	Individual leaching area≤5% Total leaching area≤10% 导体各面溶蚀区域≤5% 导体总面积溶蚀区域≤10%	260±5°C for 30 seconds 260±5°C锡炉中, 持续 30 秒
Temperature cycling 温度循环	±(1.0%+0.05Ω)	-55°C to +125°C 1000 cycles -55°C to +125°C 1000 次
Mechanical Shock 机械冲击	±(1.0%+0.05Ω)	Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6(ms). 测试½正弦脉冲, 峰值: 100g, 正常持续时间:

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		6ms
Vibration 振动	$\pm(1.0\%+0.05\Omega)$	5g's ro 20min.,12cycles each of 3 orientations 10-2000Hz 5g's 持续时间为 20 分钟, 3 次 10-2000Hz 的定向, 共 12 次循环
ESD	$\pm(3.0\%+0.05\Omega)$	Human body model 0402 / 0603 1KV 0805 and above 2KV 加载规定静电电压 0402 / 0603 1KV 0805 及以上 2KV
Resistance toSolvent 耐溶剂性	No visible damage on appearance and marking. 在外观和标识上无明显的损伤。	Add Aqueous wash chemical – OKEM Clean or equivalent. Do not use banned solvents. 添加水洗化学品-OKEM 清洁或同等物质。不要使用 被禁止的溶剂。
Terminal strength 端子强度	No broken 无损伤	Force of 1.8kg for 60 seconds. 作用力为 1.8kg, 持续 60 秒。
Flammability 阻燃性	No ignition of the tissue paper or scorching or the pinewood board 不会引燃纸巾或灼烧松木板。	V-0 or V-1 are acceptable. Electrical test not required. 可接受 V-0 或 V-1, 不需进行电气测试。
Sulfur Test 硫化测试	$\Delta R \pm 5\%$	EIA-977 (Condition A) 60 $\pm$ 2 $^{\circ}$ C, no power rating for 500 hrs. 在 60 $\pm$ 2 $^{\circ}$ C 环境下, 无负载 (无功率额定) 放置 500 小时。

Operating Voltage= $\sqrt{P \cdot R}$ or Max.Operating Voltage listed above,whichever is lower.

Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$ or Max.Overload Voltage listed above,whichever is lower.

RCWV(Rated Continuous Working Voltage)= $\sqrt{P \cdot R}$ or Max.Operating Voltage whichever is lower.

environmental conditions for electrical performance measurement, Temperature : 25 $^{\circ}$ C $\pm$ 5 $^{\circ}$ C Humidity: 25%~75%RH

Reference Standards:IEC 60115-1,60068-2-58 ; JIS-C 5201-1

■RCWV(额定持续工作电压)= $\sqrt{P \cdot R}$ 或者较小的最大操作电压.

操作电压= $\sqrt{P \cdot R}$,过负载电压= $2.5 \cdot \sqrt{P \cdot R}$,操作电流= $\sqrt{P/R}$

■电性能测量的环境条件: 温度: 25 $^{\circ}$ C $\pm$ 5 $^{\circ}$ C 相对湿度: 25%~75%RH

■依据标准: IEC 60115-1,60068-2-58 ; JIS-C 5201-1