规格书

SPECIFICATION FOR APPROVAL

产品名称：金属膜柱状贴片电阻 CSRV 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

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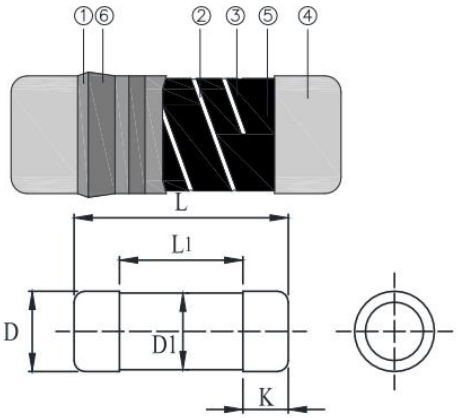
规格如有更改，恕不另行通知 2025/A

金属膜柱状贴片电阻 CSRV 系列

摘要 Resume >>>

- Excellent overall stability
  良好的整体稳定性
- Extremely low TCR down to ±5 PPM/°C
  极低的 TCR 降至±5PPM/°C
- High power rating up to 1 Watts
  高额定功率，最高可达 1W
- AEC-Q200 Compliance
  符合 AEC-Q200

结构图 Construction >>>



1	Insulation Coating 绝缘涂层
2	Trimming Line 修边线
3	Ceramic Rod 陶瓷棒
4	Electrode Cap 电极帽
5	Resistor Layer 电阻层
6	Marking 丝印

尺寸 Dimensions >>>

Size 规格	L (mm)	L1 min. (mm)	ΦD (mm)	ΦD1 (mm)	K (mm)
CSRV0102	2.20±0.10	1.1	1.10±0.10	D +0/-0.15	0.45±0.05
CSRV0204	3.50±0.20	1.7	1.40±0.15	D +0/-0.2	0.80±0.10
CSRV0207	5.90±0.20	2.9	2.20±0.20	D +0/-0.2	1.30±0.10

型号名称 Part Numbering >>>

CSRV	04	0207	L1001	B	T	N*	50PPM
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	Power 升功率	PPM/°C
CSRV：金属柱状贴片电阻	04	0102 0204 0207	±5% L102：1K Ω L1R3：1.3 Ω ±1%及以下 L1001：1K Ω L4R70 :4.7 Ω	B=±0.1% C=±0.25% D=±0.5% F=±1% J=±5%	T:Taping Reel T: 编带 B:Bulk B: 散装	P=1/5W N: 1 W G:2/5W	5 PPM 10PPM 15PPM 25PPM 50PPM 100PPM

◆N*：High Power 升功率 （非升功率不加备注）

金属膜柱状贴片电阻 CSRV 系列

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

Item 项目 / Type 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/℃)
				±0.1%	±0.25%	±0.5%	±1%	±5%	
0102	1/8W	150V	300V	100Ω-56KΩ				/	±15
				100Ω-82KΩ		49.9Ω-200KΩ	49.9Ω-390KΩ	/	±25
				/	/	1Ω-1MΩ			±50
				/	/	/	1Ω-1MΩ		±100
0204	1/4W	200V	400V	10Ω-332KΩ		/			±5
				10Ω-20KΩ				/	±10
				10Ω-300KΩ				/	±15
				10Ω-1MΩ		10Ω-3.4MΩ	1Ω-3.4MΩ		±25
				10Ω-1MΩ		1Ω-3.4MΩ	0.2Ω-3.4MΩ		±50
				/			0.1Ω-1MΩ		±100
0207	1/2W	300V	600V	10Ω-332KΩ		/			±5
				49.9Ω-20KΩ				/	±10
				10Ω-300KΩ				/	±15
				10Ω-1MΩ		10Ω-3.4MΩ	1Ω-3.4MΩ		±25
				10Ω-1MΩ		1Ω-3.4MΩ	0.2Ω-3.4MΩ		±50
				/			0.1Ω-1MΩ		±100

◆Operating Temp.Range 操作温度范围：0204～0207：-55～155℃（±5ppm -55～125℃）

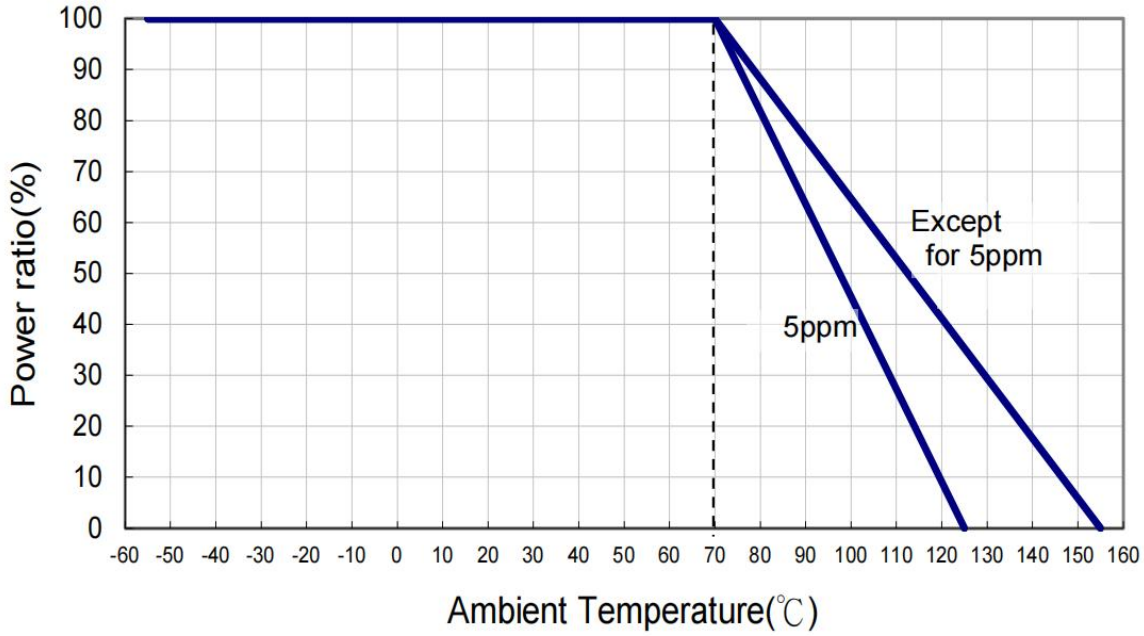
高功率厚膜晶片电阻器 High-Power Thick Film Chip Resistors >>>----------

Item 项目 / Type 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/℃)
				±0.1%	±0.25%	±0.5%	±1%	±5%	
0102	1/5W	200V	400V	100Ω-56KΩ				/	±15
				100Ω-82KΩ		49.9Ω-200KΩ	49.9Ω -390KΩ		±25
	0.3W			/	/	1Ω-1MΩ			±50
				/	/	/	1Ω-1MΩ		±100
0204	2/5W	200V	400V	10Ω-332KΩ		/			±5
				10Ω-20KΩ				/	±10
				10Ω-300KΩ				/	±15
				10Ω-1MΩ		10Ω-3.4MΩ	1Ω-3.4MΩ		±25
				10Ω-1MΩ	1Ω-1MΩ	1Ω-3.4MΩ	0.2Ω-3.4MΩ		±50
				/			0.1Ω-10MΩ		±100
0207	1W	350V	700V	10Ω-332KΩ		/			±5
				10Ω-20KΩ					±10
				10Ω-300KΩ					±15
				10Ω-1MΩ		10Ω-3.4MΩ	1Ω-3.4MΩ		±25
				10Ω-1MΩ	1Ω-1MΩ	1Ω-3.4MΩ	0.2Ω-3.4MΩ		±50
				/			0.1Ω-10MΩ		±100

◆Operating Temp.Range 操作温度范围：0204～0207：-55～155℃（±5ppm -55～125℃）

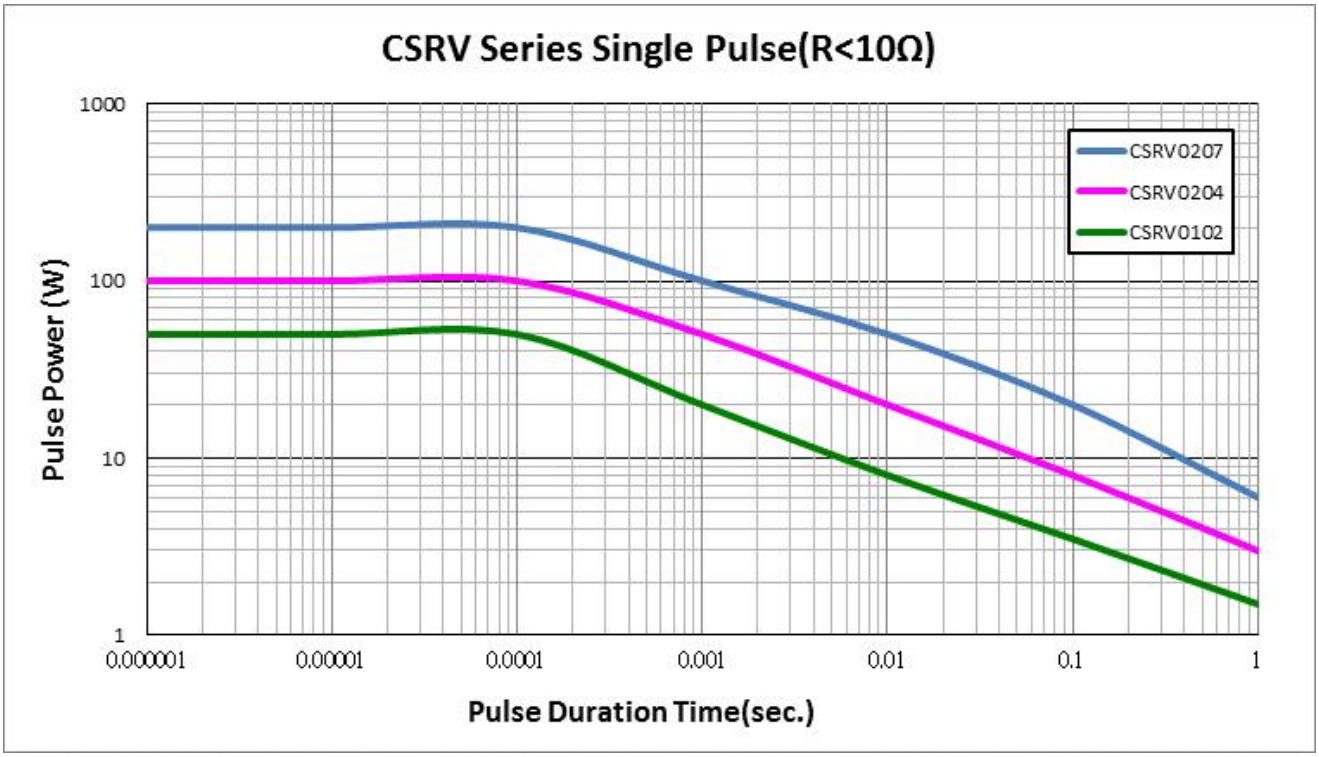
Item 项目 / Type 型号	Operating Temp.Range	Resistance	Rated Current
0102	-55 ~ +155℃	0Ω(<15mΩ)	2A
0204	-55 ~ +155℃	0Ω(<15mΩ)	3A
0207	-55 ~ +155℃	0Ω(<15mΩ)	5A

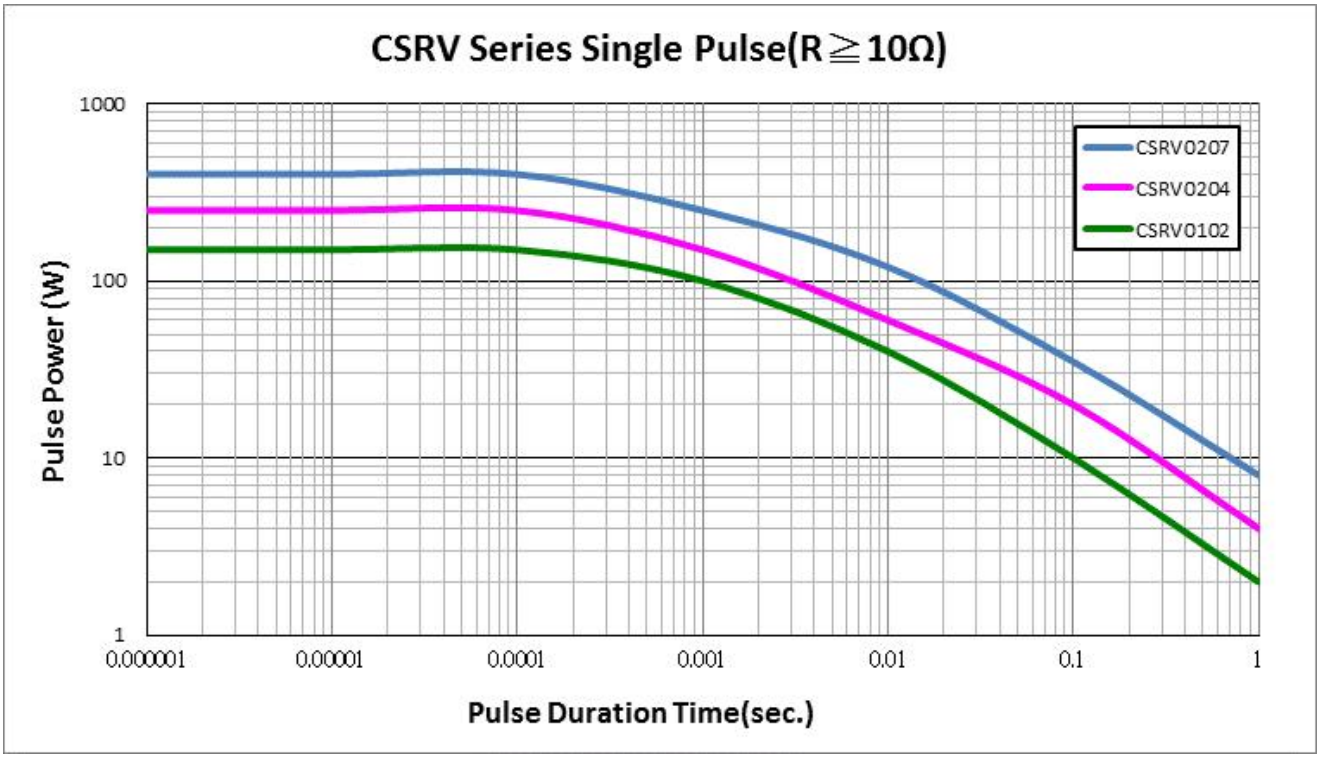
功率衰减曲线图 Derating Curve>>>----------



脉冲耐受能力 Pulse withstanding capacity>>>----------

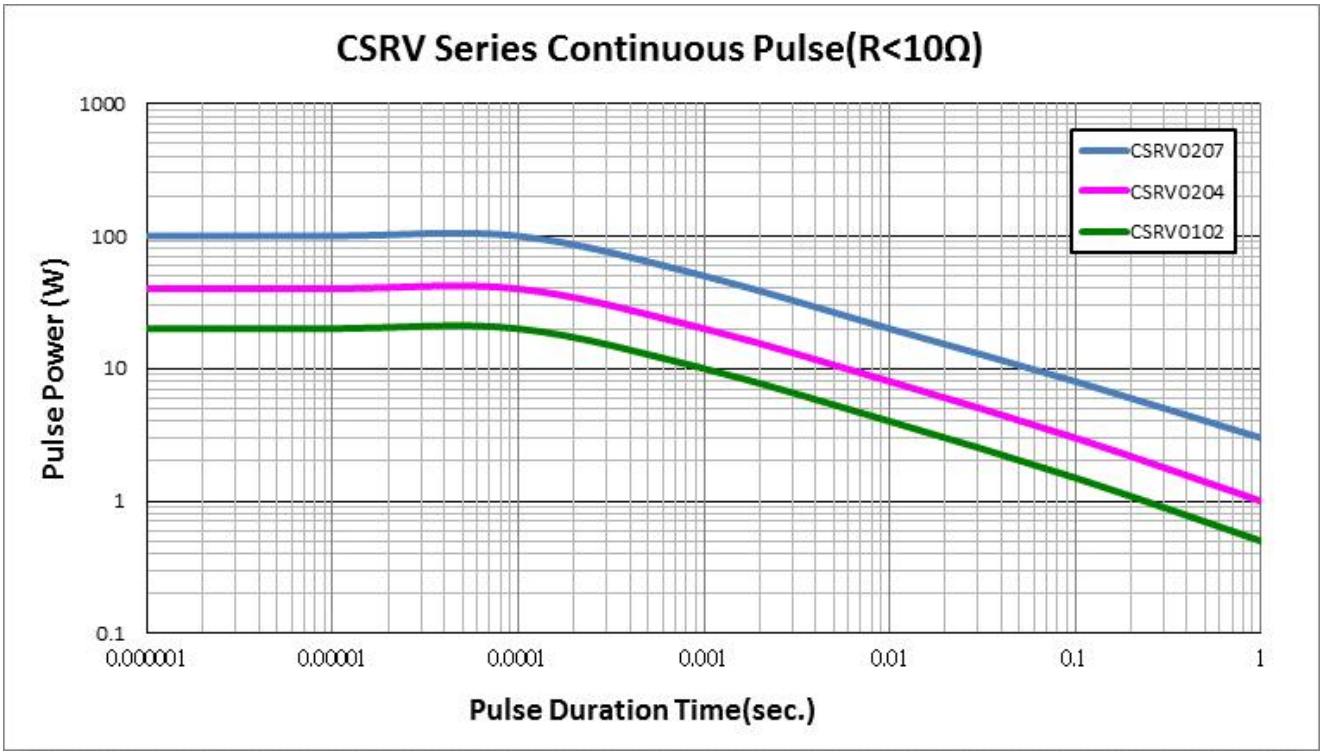
The single impulse graph is the result of the impulse of rectangular shape applied. The limit of acceptance was a shift in resistance of less than 1% from the initial value. The power applied was subject to the restrictions of the maximum permissible impulse voltage graph shown.

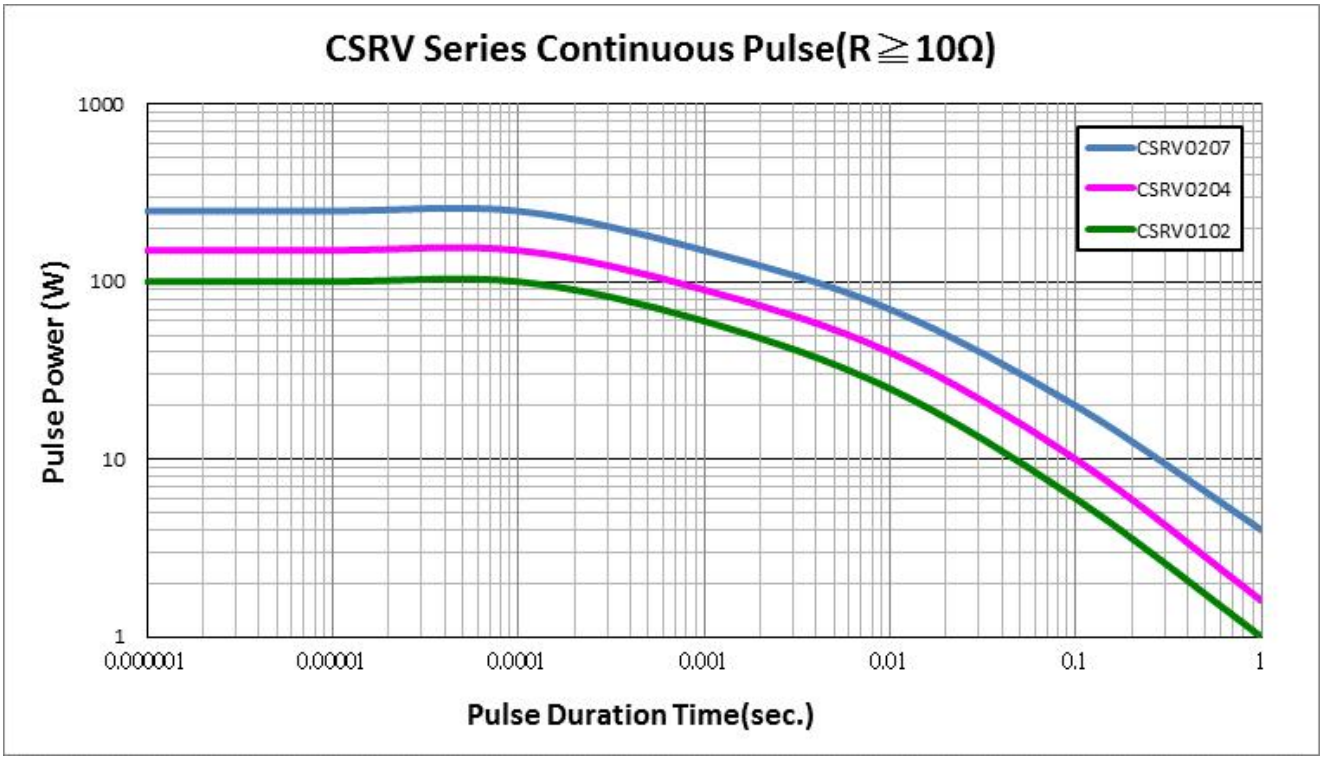




连续耐冲 Continuous Pulse>>>

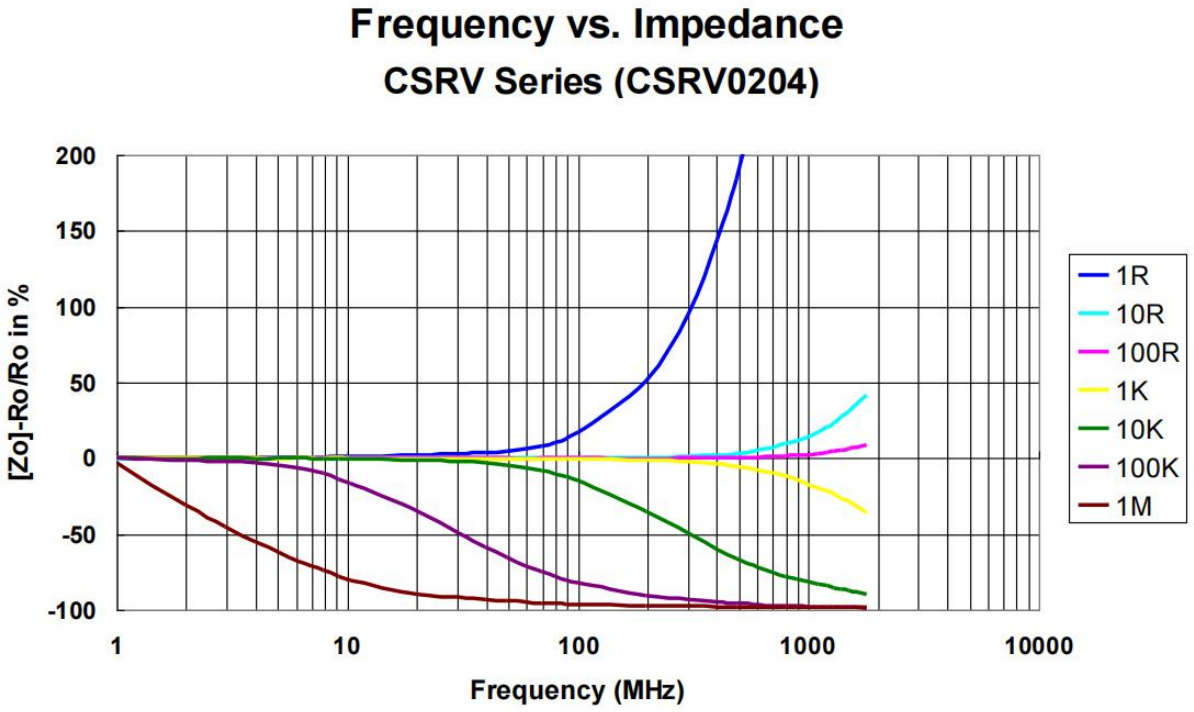
The continuous load graph was obtained by applying repetitive rectangular pulses where the pulse period was adjusted so that the average power dissipated in the resistor was equal to its rated power at 70 C. Again the limit of acceptance was a shift in resistance of less than 1% from the initial value.

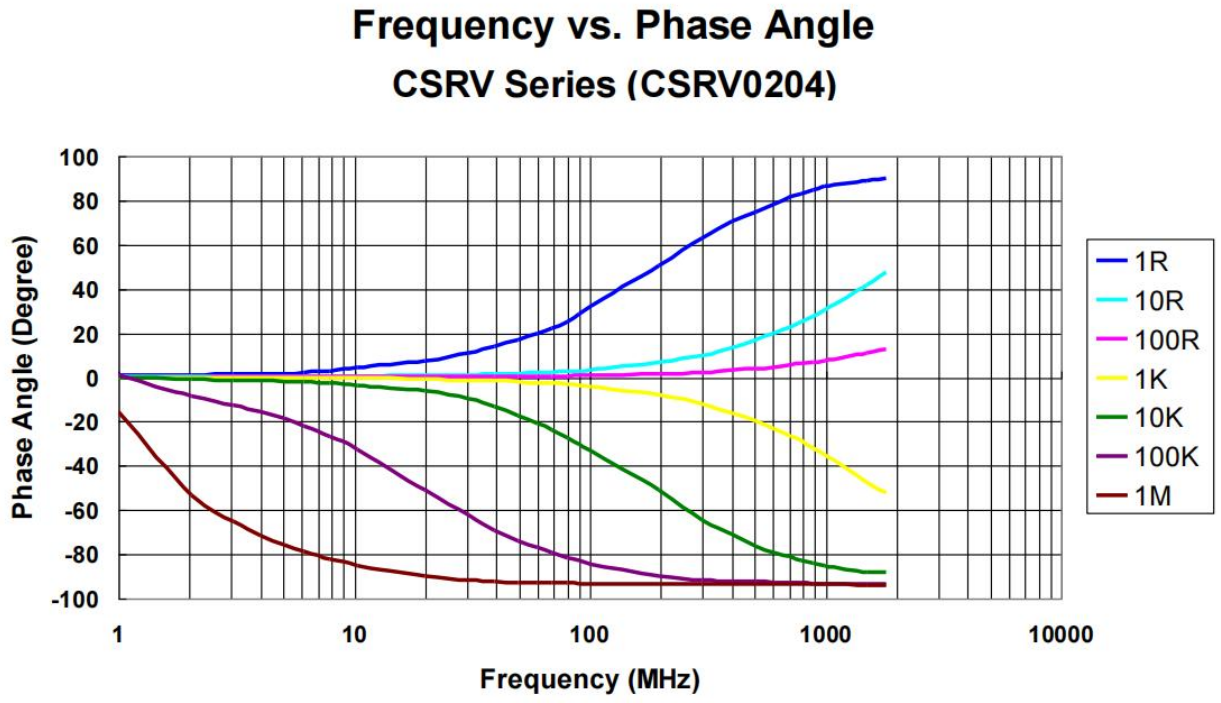




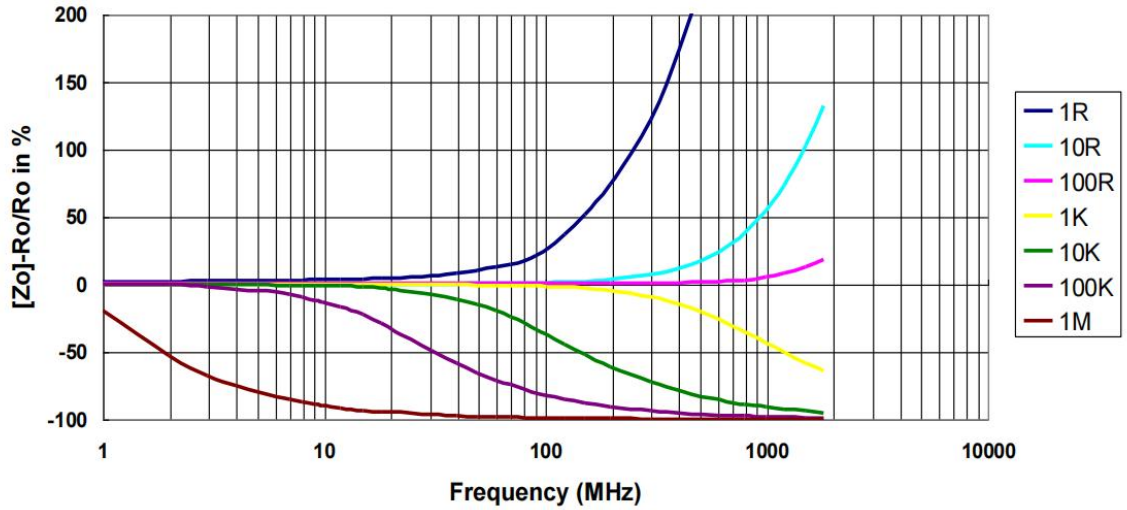
频率特性 Frequency behavior>>>

Resistors are designed to function according to ohmic laws. This is basically true of resistors for frequencies up to 100kHz. At higher frequencies, there is an additional contribution to the impedance by an ideal resistor switched in series with a coil and both switched parallel to a capacitor. The values of the capacitance and inductance are mainly determined by the dimensions of the terminations and the conductive path length.
The environment surrounding components has a large influence on the behavior of the component on the printed-circuit board.

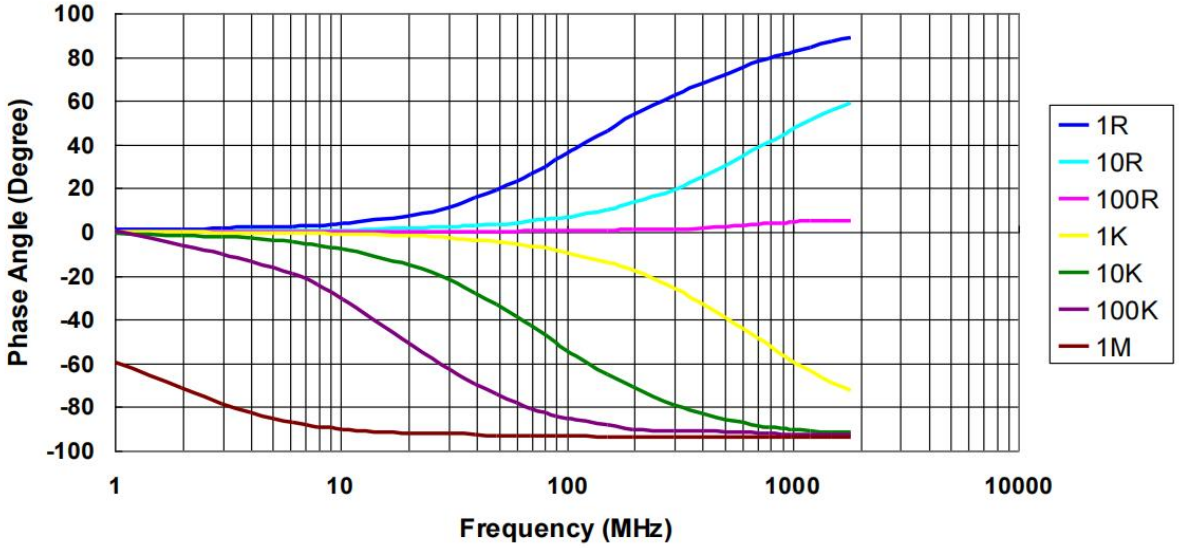




Frequency vs. Impedance
CSRV Series (CSRV0207)

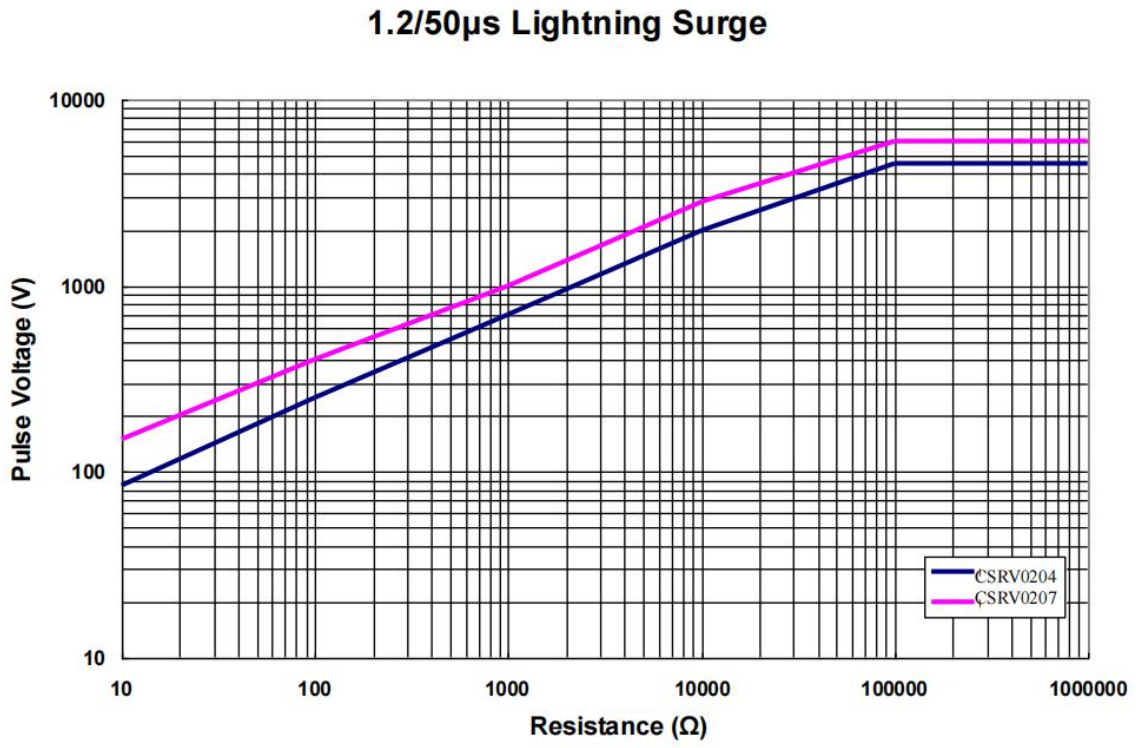


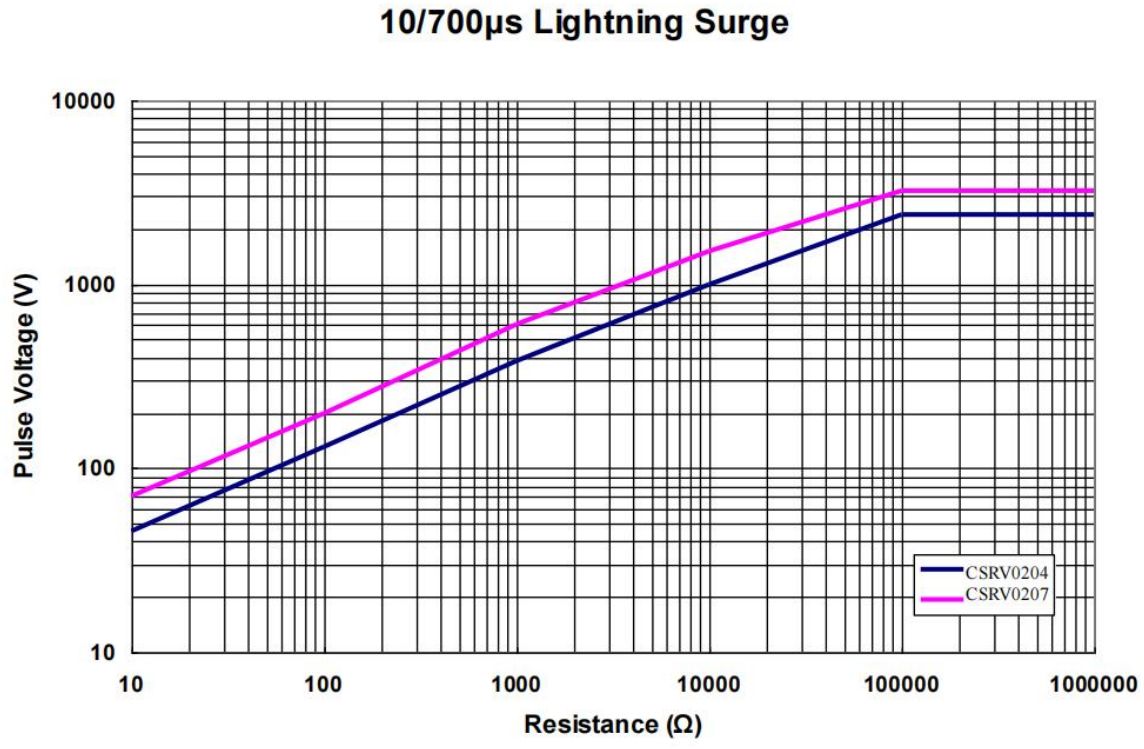
Frequency vs. Phase Angle
CSRV Series (CSRV0207)

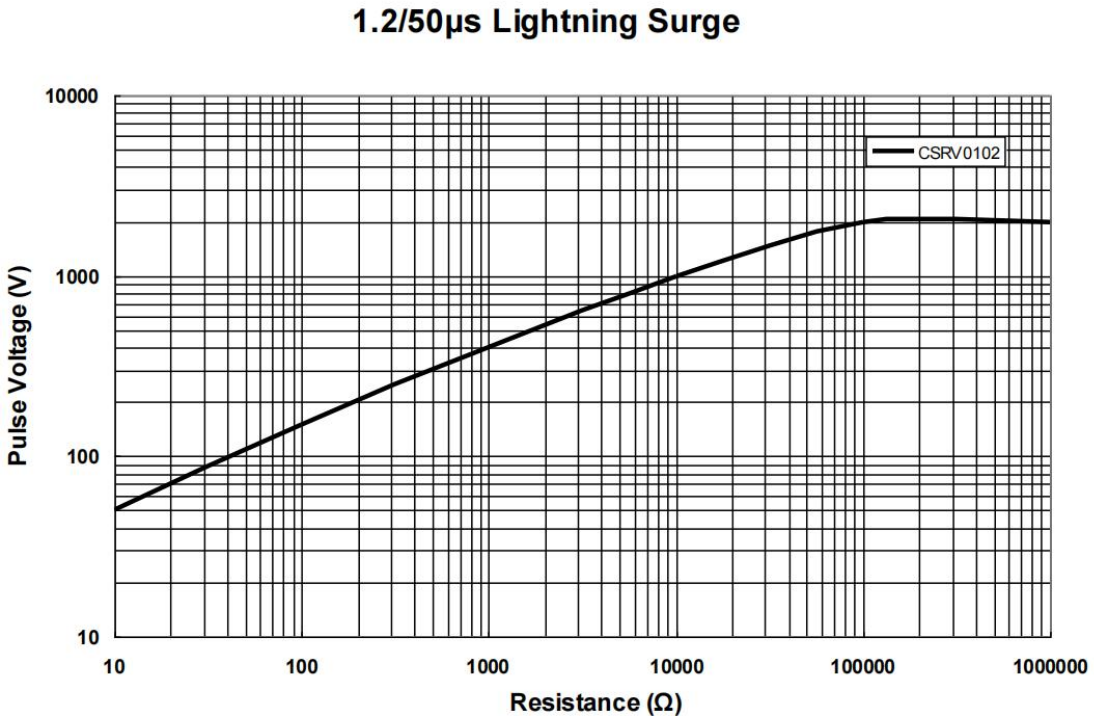


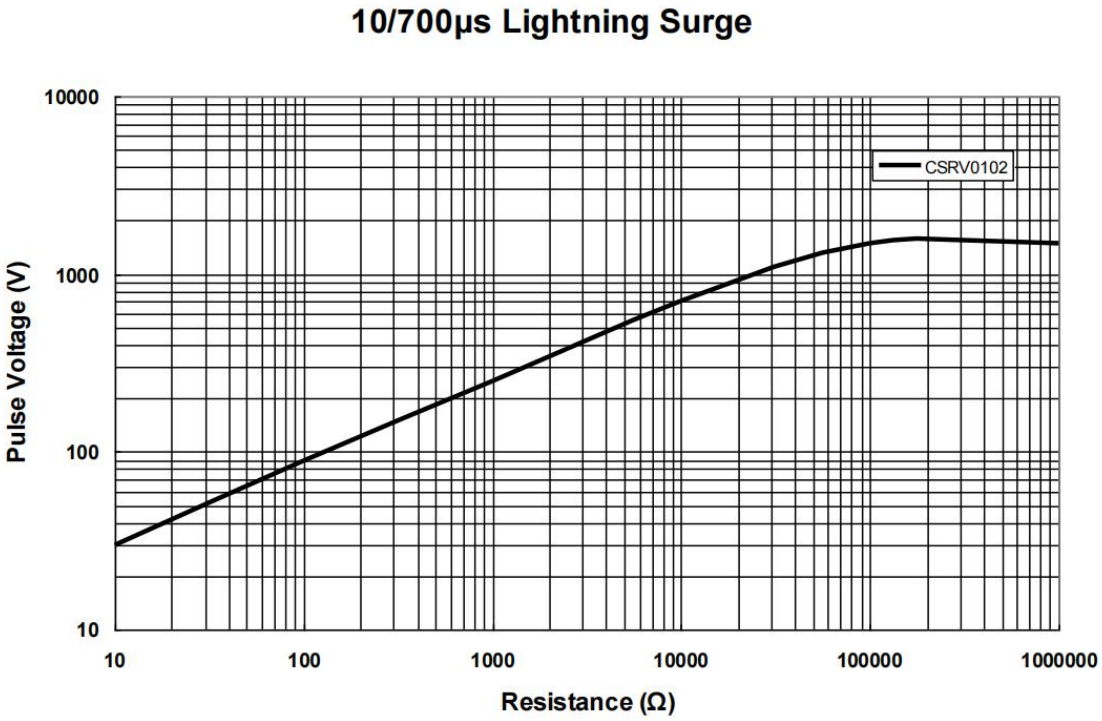
雷电冲击 Lightning Surge >>>

Resistors are tested in accordance with IEC 60 115-1 using both 1.2/50us and 10/700us pulse shapes. The limit of acceptance is a shift in resistance of less than 0.5% from the initial value.






1.2/50μs Lightning Surge
10000
1000
100
10
Pulse Voltage (V)
CSRV0102
10
100
1000
10000
100000
1000000
Resistance (Ω)


10/700μs Lightning Surge
10000
1000
100
10
Pulse Voltage (V)
CSRV0102
10
100
1000
10000
100000
1000000
Resistance (Ω)

信赖性试验项目 Environmental Characteristics >>>

Item 项目	Requirement 条件		Test Method 测试方法
	±5% &及以下	Jumper 跳线	
Temperature Coefficient (T.C.R.) 温度系数(T.C.R.)	As Spec. 参考规格表		At 25 / -55℃ and 25℃ /+125℃, 25℃ is the reference temperature 5ppm：At 25 / -10℃ and 25℃ /+85℃, 25℃ is the reference temperature 25℃为参考温度
Short Time Overload 短时间过负载	10Ω-270KΩ: ±(0.1%+0.01Ω) <10Ω & >270KΩ: ±(0.15%+0.01Ω) 0102: ±(0.15%+0.01Ω) 5ppm: ±(0.05%+0.01Ω)	<15mΩ	RCWV*2.5 or Max.Overload voltage whichever is lower for 5 seconds,2seconds for high power series 额定电压的 2.5 倍或最大负载电压 5 秒
Insulation Resistance 绝缘阻抗	≥10G		Max.Overload voltage for 1 minute 施加最大负载电压 1 分钟
Operational Life 工作寿命	10Ω-270KΩ: (0.25%+0.01Ω) <10Ω & >270KΩ: (0.5%+0.01Ω) 0102: (0.5%+0.01Ω)	<15mΩ	Measurement at 24±4 hours after test conclusion. 试验结束后 24±4 小时测量。 5ppm：70±2℃,RCWV for 1000hrs with 1.5hrs"ON"and 0.5hrs"OFF" 5ppm：70±2℃温度中施加额定电压，1.5 小时"开"，0.5 小时 "关"，共 1000 小时
Biased Humidity 偏置湿度	<10Ω: (1%+0.01Ω) 10Ω-270KΩ: (0.5%+0.01Ω) >270KΩ-3.4MΩ: (1%+0.01Ω) >3.4MΩ: (2%+0.01Ω) 0102: (2%+0.01Ω)	<15mΩ	1000hrs 85℃/85% R.H.10% of oprating power (≦100V) 在温度 85℃，相对湿度 85%环境中施加 10%的额定功率持续 1000 小时。(≦100V)
High Temperature Exposure 高温暴露	10Ω-270KΩ: ±(0.25%+0.01Ω) <10Ω & >270KΩ: ±(1%+0.01Ω) 0102: ±(1%+0.01Ω)	<15mΩ	at +125℃/+155℃ for 1000 hrs 在+125℃/+155℃ 下持续 1000 小时
Bending Strength 弯折强度测试	10Ω-270KΩ: ±(0.1%+0.01Ω) <10Ω&>270KΩ: ±(0.5%+0.01Ω) 0102: ±(0.5%+0.01Ω)	<15mΩ	Bending once for 60 seconds with 2mm 用 2mm 弯曲一次，持续 60 秒
Solderability 焊锡性	95%min.coverage 导体爬锡面积大于 95%		245±5℃ for 3 seconds 245±5℃锡炉中，持续 3 秒
Resistance to Soldering Heat 抗焊接热	10Ω-270KΩ: ±(0.1%+0.01Ω) <10Ω & >270KΩ: ±(0.25%+0.01Ω) 0102: ±(0.25%+0.01Ω) 5ppm: ±(0.05%+0.01Ω)	<15mΩ	260±5℃ for 10 seconds 260±5℃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℃ for 30 seconds 260±5℃锡炉中，持续 30 秒
Temperature Cycling 温度循环	10Ω-270KΩ: ±(0.25%+0.01Ω) <10Ω & >270KΩ: ±(0.5%+0.01Ω) 0102: ±(1%+0.01Ω)	<15mΩ	-55℃ to +125℃ 1000 cycles -55℃ to +125℃ 1000 次

Mechanical Shock 机械冲击	±(0.25%+0.01Ω)	<15mΩ	Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6. 波形：半正弦冲击脉冲的公差。峰值为 100g，正常持续时间（D）为 6。
Vibration 振动	±(0.5%+0.01Ω)	<15mΩ	5g's ro 20min.,12cycles each of 3 orientations 10-2000Hz 5g's 5g's 持续 20 分钟，3 个方向各 12 个循环，10-2000 赫兹
ESD	±(0.5%+0.01Ω)	<15mΩ	Human body, 0102/0204:2KV; 0207:4KV
Terminal strength 端子强度	No broken 不产生断裂		Force of 1.8kg 60 seconds 使用相当于 1.8kg 的压力持续 60 秒
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 清洁或同等产品。不要使用被禁止的溶剂。
Flammability 易燃性	No ignition of the tissue paper or Scorching or the pinewood board 不会引燃纸张或引起松木板的烧焦		V-0 or V-1 are acceptable.Electrical test not required 可接受 V-0 或 V-1.不做电性测试

Operating Voltage=√(P*R) or Max.Operating Voltage listed above,whichever is lower.
Overload Voltage=2.5*√(P*R) or Max.Overload Voltage listed above,whichever is lower.
RCWV(Rated Continuous Working Voltage)=√(P*R) or Max.Operating Voltage whichever is lower.
environmental conditions for electrical performance measurement,Temperature：25℃±5℃ 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)=√(P*R)或者较小的最大操作电压.
操作电压=√(P*R),过负载电压=2.5*√(P*R),操作电流=√(P/R)
■电性能测量的环境条件：温度：25℃±5℃ 相对湿度：25%~75%RH
■依据标准：IEC 60115-1,60068-2-58；JIS-C 5201-1