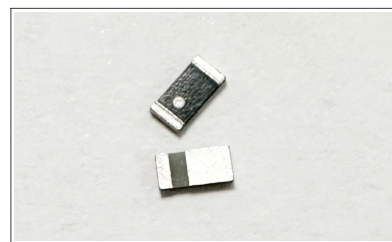


## ■ 射频功率电阻

RF-Power Resistor



### ◆ 特点 Features

- 阻抗(Impedance):  $50\Omega$ 、 $100\Omega$
- 基片材料(Substrate Material): AlN、BeO、AlO
- 阻值公差(Resistance Tolerance):  $\pm 1\%$ 、 $\pm 2\%$ 、 $\pm 5\%$
- 额定功率(Power Rating): Min 12W
- 频率(Frequency): DC ~ 6GHz
- 工作温度(Operating Temperature):  $-55 \sim +175^{\circ}\text{C}$
- 温度系数(Temperature Coefficient):  $\pm 100\text{ppm}/^{\circ}\text{C}$
- 符合RoHS 和REACH高关注物质要求(RoHS & REACH Compliant)

### ◆ 薄膜优势 Superiority of Thin Film Technique

- 稳定的高频性能(Stable frequency performance)
- 较低的寄生效应(Lower parasitics)
- 低电阻温度系数 (Lower TCR)
- 低噪音(Low noise)

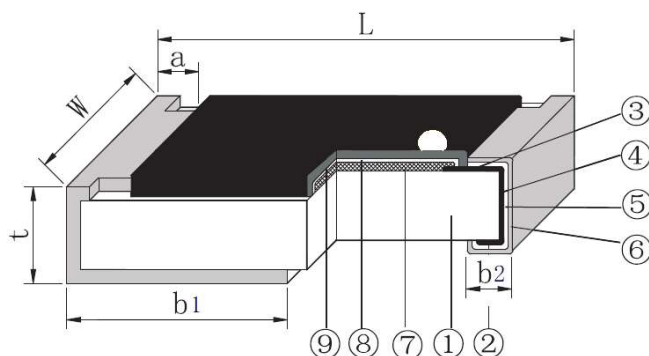
### ◆ 型号表示方法 Part Number

GRF	50R0		J	012		S	1206		N	T		L				
产品代号 Product Code	阻值代号 Resistance Code		阻值精度 Tolerance Code		功率代号 Power Code		结构代号 Construction Code		尺寸代号 Dimension Code		基板代号 Substrate Code		包装代号 Packing Code		環保代號 Environmental Code	
射频电阻 RF Resistor	位 数 Code	代 号 Code	代 号 Code	精度 Tolerance	代 号 Code	功率 Power	代 号 Code	型号 Type	代 号 Code	尺寸 Dimension	代 号 Code	基板 Substrate	代 号 Code	方式 Type	代 号 Code	方式 Type
	3位	E24	F	±1%	005	5W	S	表贴式	1206	3.2*1.6	N	ALN	T	编带		普通
	4位	E96	G	±2%	012	12W	L	引线式	5789	5.7*8.9	B	BEO	P	管装	L	低铅
			J	±5%	100	100W	F	法兰式	9595	9.5*9.5	O	ALO	C	散料	G	无铅

注: 阻值 $50\pm 5\%\Omega$ 、功率12W、贴片尺寸3.2\*1.6mm、编带包装普通品, 表示为GRF-50R0J012S1206NT。

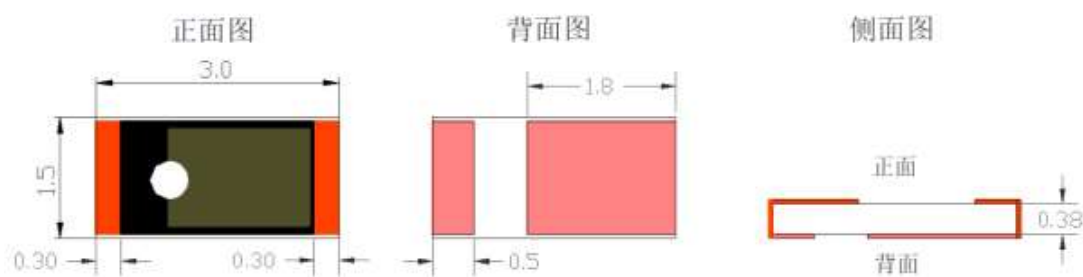
Note: Resistor value  $50\pm 5\%\Omega$ , power 12W, dimension 3.2\*1.6mm, taping pacakaging, P/N:GRF-50R0J012S1206NT

### ◆ 结构 Construction



- ①陶瓷基板 Ceramic Substrate
- ②背电极 Bottom Electrode
- ③面电极 Top Electrode
- ④端电极 Inner Termination
- ⑤中间电极 Middle Termination
- ⑥外部电极 Outer Termination
- ⑦电阻体 NiCr Resistive Element
- ⑧钝化层 Passivation
- ⑨保护层 Protective Coating

# ◆ 规格尺寸 Dimensions

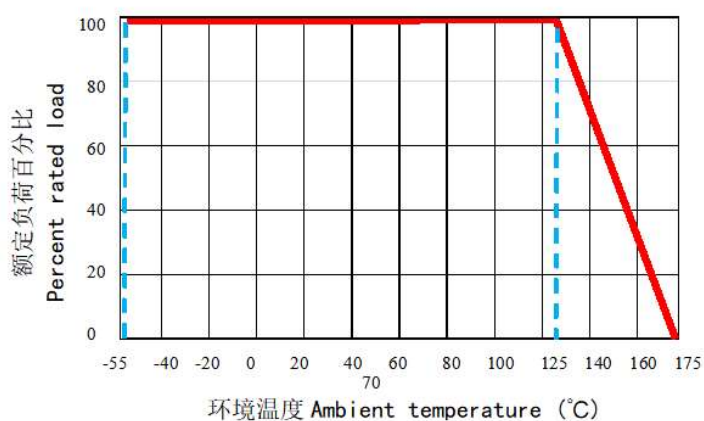


型号 Type	尺寸 Dimensions(mm)					
	L	W	t	a	b1	B2
GRF1206	0.30±0.20	1.50±0.20	0.38±0.15	0.30±0.20	1.80±0.20	0.50±0.20

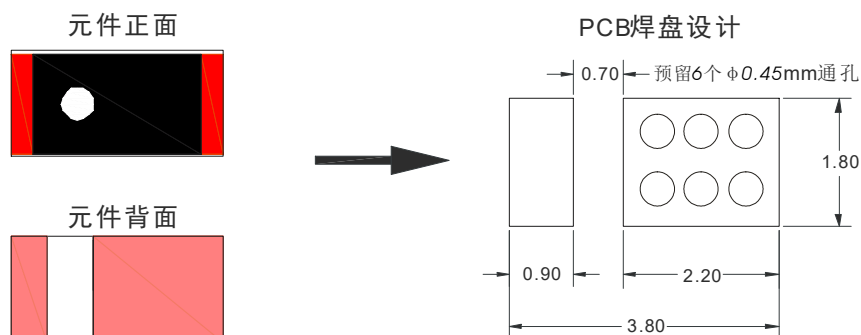
# ◆ 电气特性 Electrical Characteristics

型号 Type	标准阻值 Resistance Value (Ω)	额定功率 Rated Power (W)	工作温度 Operate Temperature (°C)	工作频率 Operate Temperature (GH z)	电压驻波比 VSWR
GRF-50R0J012S1206NT (50Ω/12W/1206)	50	12	-55~175	DC~4.0	≤1.22
				4.01~6.0	≤1.28

# ◆ 负荷下降曲线 Derating Curve



# ◆ 推荐焊盘尺寸 Recommend Solder Pad Size



**◆ 特性 Characteristics**

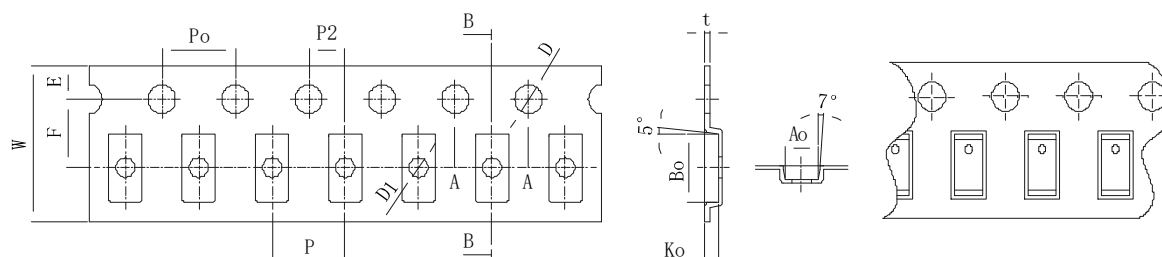
项目 Item	标准 Specifications	测试方法 Test Methods
功率循环 Power Cycle	<p>器件外观无异常，驻波比满足规格要求，负载要求阻值变化率。  <math>\Delta R \leq 5.0\%R</math></p> <p>There is no abnormality in the appearance of the device, the standing wave ratio meets the specification requirements, and the load requires resistance change rate <math>\Delta R \leq 5.0\%R</math>.</p>	<p>将器件通过回流焊方式焊接到测试板上，给器件施加直流额定功率（缓慢加压），同时使器件安装面温度保持在降额温度点附近，每通电3s、断电3s为一个循环，持续3000个循环。</p> <p>Solder the device to the test board by reflow soldering, apply the DC rated power to the device (slowly pressurize), and keep the temperature of the device mounting surface near the derating temperature point. 3000 cycles.</p>
功率考核 Power Assessment	<p>器件外观无异常，驻波比满足规格要求，负载要求阻值变化率。  <math>\Delta R \leq 5.0\%R</math></p> <p>There is no abnormality in the appearance of the device, the standing wave ratio meets the specification requirements, and the load requires resistance change rate <math>\Delta R \leq 5.0\%R</math>.</p>	<p>将器件通过回流焊方式焊接到测试板上，给器件施加1.5倍额定功率（缓慢加压），同时使器件安装面温度保持在降额温度点附近，持续100h。（与功率循环串联进行，功率循环试验后样品直接进行功率考核试验。）</p> <p>Solder the device to the test board by reflow soldering, apply 1.5 times the rated power (slow pressure) to the device, and keep the temperature of the mounting surface of the device near the derating temperature point for 100h. (It is carried out in series with the power cycle, and the sample is directly subjected to the power assessment test after the power cycle test.)</p>
电耐久性 Electrical Durability	<p>器件外观无异常，驻波比满足规格要求，负载要求阻值变化率。  <math>\Delta R \leq 5.0\%R</math></p> <p>There is no abnormality in the appearance of the device, the standing wave ratio meets the specification requirements, and the load requires resistance change rate <math>\Delta R \leq 5.0\%R</math>.</p>	<p>将器件通过回流焊方式焊接到测试板上，给器件施加直流额定功率（缓慢加压），同时使器件安装面温度保持在降额温度点附近，每加电90min、断电30min，再加电90min、断电30min，持续1000h。</p> <p>Solder the device to the test board by reflow soldering, apply the DC rated power (slow pressure) to the device, and keep the temperature of the device mounting surface near the derating temperature point, every 90 minutes of power-on, power-off for 30 minutes, and then power on again 90min, power off for 30min, lasting 1000h.</p>
短时间过载 Short Time Overload	<p>试验过程中器件表面无飞狐燃烧现象，放置30min后，要求驻波比满足规格要求，负载要求阻值变化率<math>\Delta R \leq 5.0\%R</math></p> <p>During the test, there was no flying fox burning on the surface of the device. After being placed for 30 minutes, the standing wave ratio is required to meet the specification requirements, and the load requires resistance change rate <math>\Delta R \leq 5.0\%R</math>.</p>	<p>将器件通过回流焊方式焊接到测试板上，给器件施加1.7倍的额定功率，50Hz的交流电压，每通电0.1s、断电0.5s为一个循环，持续3个循环。</p> <p>Solder the device to the test board by reflow soldering, and apply 1.7 times the rated power and 50Hz AC voltage to the device. Each power-on for 0.1s and power-off for 0.5s is a cycle for 3 cycles.</p>
可焊性 Solderability	<p>器件外观无异常，焊盘润湿面积<math>\geq 95\%</math>。</p> <p>There is no abnormality in the appearance of the device, and the wetted area of the pad is <math>\geq 95\%</math>.</p>	<p>将器件浸入温度为<math>245 \pm 5^\circ\text{C}</math>的无铅（SAC305）锡炉中，停留5s。</p> <p>Immerse the device in a lead-free (SAC305) tin furnace at a temperature of <math>245 \pm 5^\circ\text{C}</math> for 5s.</p>
耐焊接热 Resistant to Soldering Heat	<p>器件外观无异常，侧棱无镀层开裂情况，焊盘侵蚀面积<math>\leq 5\%</math>。</p> <p>There is no abnormality in the appearance of the device, there is no cracking of the coating on the side edges, and the erosion area of the pad is <math>\leq 5\%</math>.</p>	<p>将器件浸入温度为<math>260 \pm 5^\circ\text{C}</math>的无铅（SAC305）锡炉中，停留10s。</p> <p>Immerse the device in a lead-free (SAC305) tin furnace at a temperature of <math>260 \pm 5^\circ\text{C}</math> for 10s.</p>
高温储存 High Temperature Storage	<p>器件外观无异常，驻波比满足规格要求，负载要求阻值变化率<math>\Delta R \leq 5.0\%R</math>。</p> <p>There is no abnormality in the appearance of the device, the standing wave ratio meets the specification requirements, and the load requires resistance change rate <math>\Delta R \leq 5.0\%R</math>.</p>	<p>将器件搁置在<math>150^\circ\text{C}</math>的空气中168h，恢复2h。</p> <p>The device was left in air at <math>150^\circ\text{C}</math> for 168h and recovered for 2h.</p>

# ◆ 特性 Characteristics

项目 Item	标准 Specifications	测试方法 (IEC60115-1) Test Methods (IEC60115-1)
低温储存 Low Temperature Storage	低温储存器件外观无异常, 驻波比满足规格要求, 负载要求阻值变化率。 $\Delta R \leq 5.0\%R$ There is no abnormality in the appearance of the device, the standing wave ratio meets the specification requirements, and the load requires resistance change rate $\Delta R \leq 5.0\%R$ .	将器件搁置在 $-55^{\circ}\text{C}$ 的空气中168h, 恢复2h。 The device was left in air at $-55^{\circ}\text{C}$ for 168h and recovered for 2h.
温度冲击 Temperature Shock	器件外观无异常, 驻波比满足规格要求, 负载要求阻值变化率 $\Delta R \leq 5.0\%R$ There is no abnormality in the appearance of the device, the standing wave ratio meets the specification requirements, and the load requires resistance change rate $\Delta R \leq 5.0\%R$ .	将器件通过回流焊方式焊接到测试板上, 并放置于温度在 $-55^{\circ}\text{C}$ ~ $125^{\circ}\text{C}$ 之间不断转换的环境中, 其中在上、下限温度下各维持30min, 温度转换时间 $\leq 5\text{min}$ , 循环100次。 Solder the device to the test board by reflow soldering, and place it in an environment where the temperature is constantly changing between $-55^{\circ}\text{C}$ ~ $125^{\circ}\text{C}$ , in which the upper and lower temperature are maintained for 30min each, the temperature conversion time is $\leq 5\text{min}$ and the cycle is 100 times.
推力试验 Thrust Test	器件无松动或脱落, 焊点无开裂现象。 There is no loosening or falling off of the device, and no cracking of the solder joints.	将器件通过回流焊方式焊接到测试板上, 从侧面水平施加10N的力, 维持10s。 Solder the device to the test board by reflow soldering, and apply a force of 10N horizontally from the side for 10s.
抗板弯曲试验 Anti-plate Bending Test	器件外观无异常, 焊点无开裂现象, 驻波比满足规格要求, 负载要求阻值变化率 $\Delta R \leq 5.0\%R$ There is no abnormality in the appearance of the device, no cracking in the solder joints, the standing wave ratio meets the specification requirements, and the load requires resistance change rate $\Delta R \leq 5.0\%R$ .	将器件通过回流焊方式焊接到测试板上, 施加压力使单板弯曲至1mm, 维持5s, 恢复后测试性能。 Solder the device to the test board by reflow soldering, apply pressure to bend the board to 1mm, maintain it for 5s, and test the performance after recovery.

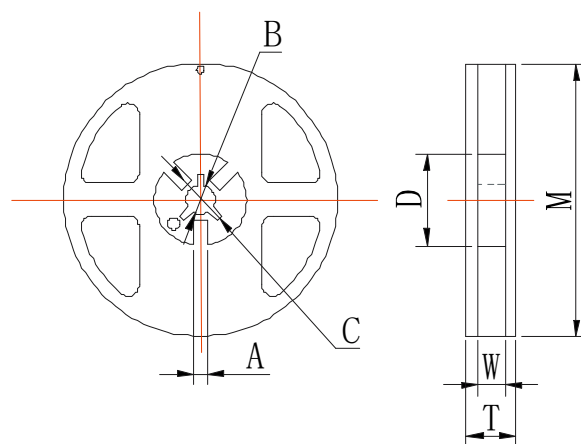
# ◆ 包装尺寸 Packaging and Dimensions(mm)

## 塑料带 Taping



Part 1	W	P	E	F
1.60 0.10 GRF1206	8.00±0.10	4.00±0.10	1.75±0.10	3.50±0.05
	P2	D	D1	P0
1.60 0.10	2.00±0.05	1.50±0.10	1.00±0.10	4.00±0.10
Part 2	A0	B0	K0	t
GRF1206	1.85±0.10	3.50±0.10	0.73±0.10	0.23±0.05

◆ 卷盘 Reel



型号 Type	数量 Quantity	M (mm)	W (mm)	T (mm)	A (mm)	B (mm)	C (mm)	D (mm)
GRF1206	5000	178±2.0	9.5±1.0	12.5±1.5	2.0±0.5	13.0±0.5	21.0±0.5	58.0±2.0