



富捷科技

Product Datasheet

产品规格说明书

FMH Series

Alloy Film High Power Resistance

金属膜合金高功率电阻器

安徽省富捷电子科技有限公司

ANHUI FOJAN ELECTRONICS TECHNOLOGY CO., LTD

安徽省马鞍山市郑蒲港新区金蒲电子产业园

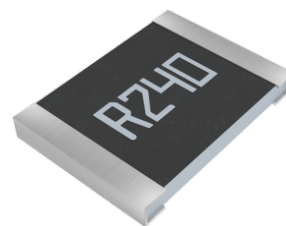
JINPU ELECTRONIC INDUSTRIAL PARK, ZHENGPU PORT NEW
DISTRICT, MAANSHAN CITY, ANHUI PROVINCE

zoey@fosan.net.cn www.fosan.vip

金属膜合金高功率电阻器

Alloy Film High Power Resistance

FMH Series



■ 特点 (Features)

- 散热性能好
- 用于高功率耗散
- 用于电流检测的低电流, 高精度电阻
- 低温度系数
- 绝缘耐压: 500V DC
- 无铅, 符合 RoHS、Reach 要求
- Good performance for Heat Dissipation
- For High Power Dissipation
- Low Resistance and High Accuracy Resistor for Current Detection
- Low temperature coefficient
- Dielectric Withstanding Voltage: 500V DC
- Pb-free to Meet RoHS、Reach Requirements

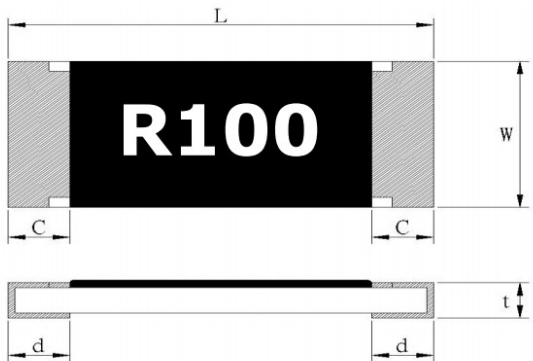
■ 应用 (Application)

- DC-DC 转换器, 电池组, 充电, 适配器
- 便携式仪器(PDA 和手机)
- 电压调节模块(VRM)
- 过流保护
- 电流检测
- 电源管理应用
- DC-DC Converter, Battery Pack, Charge, Adaptor
- Portable Instruments (PDA and Cell Phone)
- Voltage Regulation Module (VRM)
- Over current protection
- Current sensing
- Power Management Applications

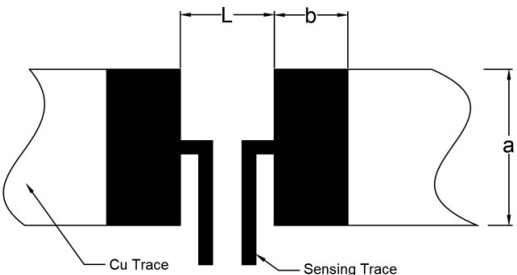
■ 产品料号 (Parts Number Explanation) 示例: FMH252WFR100TM

FMH 系列	25 尺寸	2W 功率	F 公差	R100 字码	T 包装别	M 材质	特殊型
FMH	12:1206 20:2010 25:2512	1W: 1W 15: 1.5W 2W: 2W	F:±1% G:±2% J:±5%	R100=100mΩ R500=500mΩ	T: 7 inch reel R:13 inch reel B: Bulk	M: Metal	Blank: none L: large electrode
Type	Size	Power	Tolerance	Resistance	Packaging	Termination	Special Case

■ 尺寸 (Dimension)

尺寸 Dimension						单位 (unit) : mm
	型别 (Type)	L	W	C	d	t
	1206	3.2±0.20	1.55±0.20	0.5±0.30	0.4±0.2	0.55±0.10
	2010	5.0±0.20	2.5±0.20	0.6±0.30	0.5±0.25	0.6±0.10
	2512	6.4±0.20	3.2±0.20	0.6±0.30	0.5±0.25	0.55±0.10

■ 推荐焊盘尺寸 (Recommended Pad Dimension)

焊盘尺寸 Pad Dimension					单位 (unit) : mm
	型别 (Type)	阻值范围 Resistance Range (mΩ)	a	b	L
	1206	100~910	2.50±0.20	2.55±0.20	0.70±0.20
	2010	100~910	3.5±0.20	2.60±0.20	1.0±0.20
	2512	100~910	4.2±0.20	3.25±0.20	1.0±0.20

■ 电气特性 (Electrical characteristics)

型别 Type	额定功率 Power Rating at P70 (W)	T.C.R. (PPM/ °C)	阻值范围 Resistance Range (mΩ)	精度 Tolerance (%)	绝缘阻抗 Insulation Resistance	最大工作电压 Maximum Working Voltage(V)	使用温度范围 Operating Temperature (°C)
1206	1	±100	100~910	±1%, ±2%, ±5%	Over 100MΩ	(P*R) ^{1/2}	-55°C~155°C
2010	1、1.5	±100	100~910	±1%, ±2%, ±5%	Over 100MΩ	(P*R) ^{1/2}	-55°C~155°C
2512	1、1.5、2	±100	100~910	±1%, ±2%, ±5%	Over 100MΩ	(P*R) ^{1/2}	-55°C~155°C

如有非标准品的需求,请联系我们的业务部门 For non-standard parts, please contact our sales dept.

■ 印字标识 (Marking)

a. The decimal point of Ω is indicated by the character "R".

E.g.,

R100=100mΩ; R500=500mΩ;

a. 以 "R" 字指示 Ω 的小数点的位置

例:

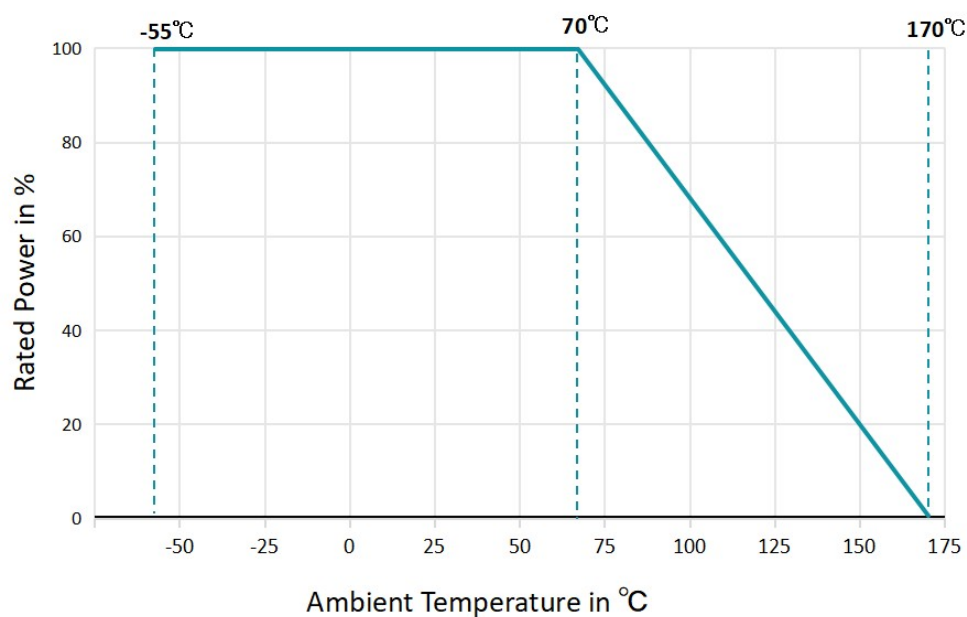
R100=100mΩ; R500=500mΩ;

■ 性能 (Performance)

Test Items 测试项目	Reference 依据标准	Conditions of Test 测试条件	Test Limits 测试结果
Temperature Coefficient of Resistance 温度系数	IEC60115-1-4.8 JIS-C5201-1-4.8	Measuring points 25°C and 125°C, reference point +25°C 测量点 25°C和 125°C, 参考点 25°C	见 电气特性 As Electrical characteristics
Short time overload 短时过载	IEC60115-1-4.13 JIS-C5201-1-4.13	5 X rated power for 5s 5 倍额定功率, 5 秒	±(1.0%+0.5m Ω)
Biased Humidity 高温高湿	MIL-STD-202 Method 103	10% Rated power at 85°C, RH:85%, 1000Hrs, Measurement at 24hrs after test conclusion. 10%额定功率, 85°C, 相对湿度: 85%, 1000 小时, 测试结束后 24 小时测量。	±(1.0%+0.5m Ω)
Load Life 负载寿命	IEC60115-1-4.25.1 JIS-C5201-1-4.25.1	1000 h at +70 °C, 1.5 h "ON", 0.5 h "OFF", Measurement at 24hrs after test conclusion. 1000 小时, +70 °C, 1.5 小时"开启", 0.5 小时"关闭", 测试结束后 24 小时测量。	±(5.0%+0.5m Ω)
Resistance to Soldering Heat 耐焊接热	IEC60115-1-4.18 JIS-C5201-1-4.18	T=260±5°C solder, 10±1 sec dwell 260±5°C焊接, 停留 10±1 秒。	±(1.0%+0.5m Ω)

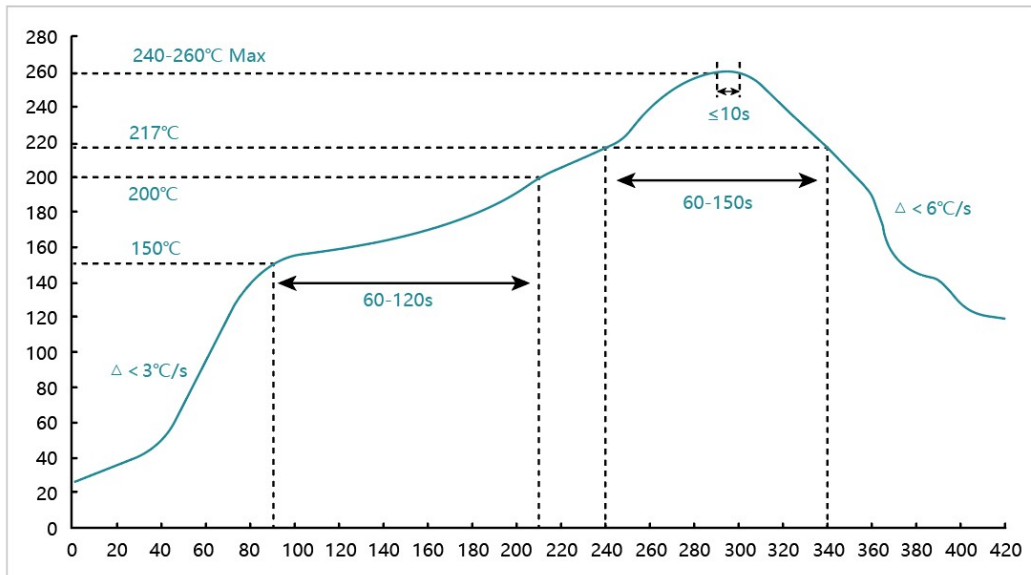
Mechanical Shock 机械冲击	MIL-STD-202 Method 213	100g's, Normal duration is 6ms, half sine shock pulse 正半弦波,峰值加速度 100g's,脉冲持续 6ms,三轴六向各 3 次。	$\pm(1.0\%+0.5m\ \Omega)$
Board Flex 板弯曲试验	IEC60115-1-4.33 JIS-C5201-1-4.33	Min 2mm deflection ,60sec. 2mm,保持时间 60s	$\pm(1.0\%+0.5m\ \Omega)$
Thermal Shock 冷热冲击	IEC60115-1-4.19 JIS-C5201-1-4.19	-55°C/+155°C. Note: Number of cycles required-1000, Maximum transfer time-20 seconds, Dwell time-15 minutes. -55°C, 15 分钟~常温<20 秒~+155°C, 15 分钟, 1000 个循环	$\pm(1.0\%+0.5m\ \Omega)$
Solderability 可焊性	IEC60115-1-4.17 JIS-C5201-1-4.17	Dip the terminal in a flux and then dip into a soldering bath at $245\pm5^{\circ}\text{C}$ for $3\pm0.5\text{sec}$ 沾助焊剂后浸入锡炉, 锡炉温度 $245\pm5^{\circ}\text{C}$, 时间 3 ± 0.5 秒。	> 95% area covered > 95%面积上锡

■ 功率衰减曲线 (Derating Curve)

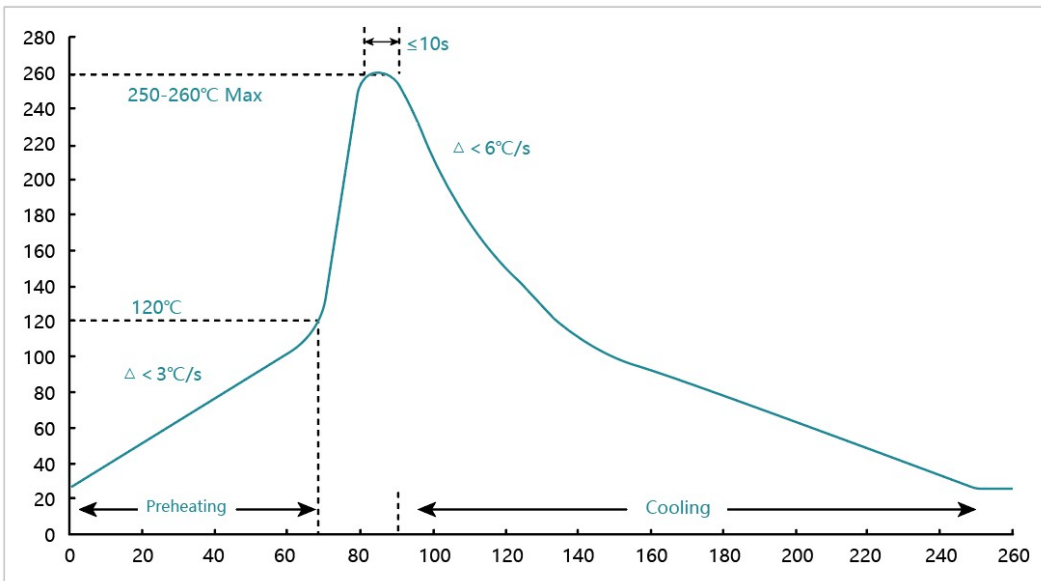


■ 焊接 (soldering)

- 建议回流焊曲线 (Recommend reflow soldering profile)



- 建议波峰焊曲线 (Recommend wave soldering profile)

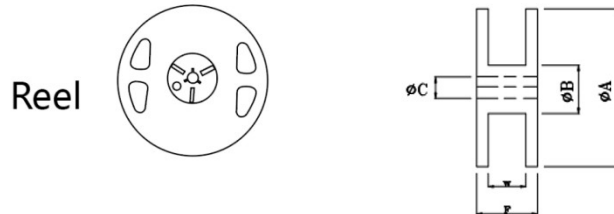


- 手工焊温度 (hand soldering temperature)

烙铁温度 $350\pm 10^{\circ}\text{C}$ 3秒之内, 避免烙铁接触电阻本体

The iron temperature is $350\pm 10^{\circ}\text{C}$, hand soldering time less than 3S. Avoid solder iron tip direct touch the components body

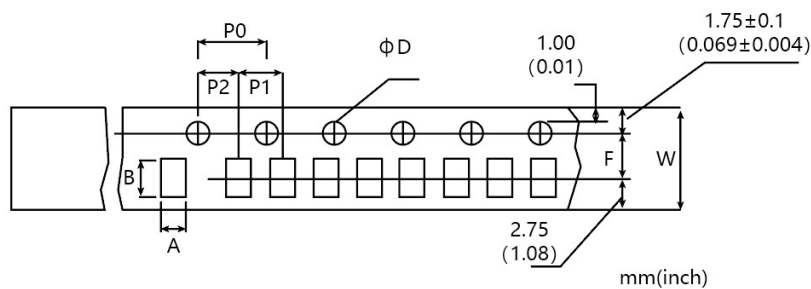
■ 包装规格 (Tapping Specification)



- 卷盘尺寸 (Reel dimension)

Type	Size		Unit	A	B	C	F	W
1206	7"	5K/Reel	mm	178±2.0	60.0±1.0	13.5±0.5	11.4±1.0	9.00±0.5
2010	7"	4K/Reel	mm	178±2.0	60.0±1.0	13.5±1.0	15.4±1.0	13.8±1.0
2512	7"	4K/Reel	mm	178±2.0	60.0±1.0	13.5±1.0	15.4±2.0	13.0±1.0

- 包装尺寸 (packing dimension)



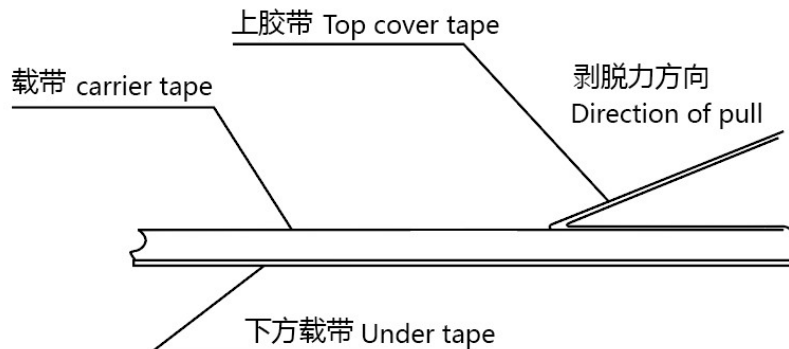
Unit: mm

Type	A	B	D	F	P0	P1	P2	W
1206	2.00 ± 0.20	3.60 ± 0.20	1.50 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	8.0 ± 0.20
2010	2.80 ± 0.20	5.30 ± 0.20	1.50 ± 0.10	5.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	12.0 ± 0.10
2512	3.60 ± 0.20	6.90 ± 0.20	1.50 ± 0.10	5.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	12.0 ± 0.10

■ 上胶带剥离力测试 (Peel force of top cover tape)

上胶带以 200mm/分钟的速度，沿 165~180 度角的方向进行剥离，如下图所示。纸带的剥离力范围为 10g~70g；载带的剥离力范围 30~100g。

The top cover tape is pulled at a speed of 200 mm/min with the angle between the tape during peel and the direction of unreeling maintained at 165 to 180 degree as following picture. The peel force of paper carrier tape shall be 0.1N to 0.7N(10 to 70 g), the peel force of plastic carrier tape shall be 0.3N to 1N (30 to 100 g)



■ 合金电阻器使用说明 (Alloy Resistor Instructions for use)

本产品以下特殊环境下应用，性能可能会受到影响：

(Application of the products in a special environment can deteriorate product performance) :

1. 高温；
High temperature
2. 有海风或腐蚀性气体，包括氯气，硫化氢，氨气，二氧化硫，二氧化氮等；
Near the sea, or corrosive gas, such as Cl_2 , H_2S , NH_3 , SO_2 , and NO_2 , etc;
3. 各种类型的液体，包括水，油，化学品，有机溶剂的使用；
Unverified liquids, such as water, oil, chemical or organic solvent;
4. 在用树脂或其他涂层材料密封产品的情况下使用；
Unverified resin or paint to cover products;
5. 焊接后使用不洁焊剂或使用水或水溶性清洁剂清洗产品
Products should be washed with soluble cleaner even if non cleaning flux.

■ 储存 / 搬运条件 (Storage / Carry conditions)

1. 储存温度 $25 \pm 5^\circ\text{C}$ Temperature: $25 \pm 5^\circ\text{C}$
2. 湿度 30~70%RH Humidity: 30~70%RH
3. 储存期限：先进先出，2 年 Storage life: 2years FIFO
4. 存放和搬运时，请保持盒子的正确方向。严禁跌落在箱体上，否则可能损坏产品电极或本体
Please hold box correct orientation when storing and carrying. It is strictly prohibited to fall on the box.
otherwise the product electrode or body may be damaged.



■ 修订履历 (Revision History)

[illegible]