

### 1. 适用范围 / SCOPE

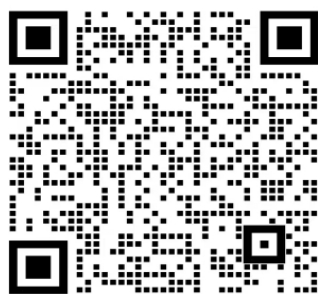
此份规格书涵盖 HFPL0603-series 金属箔电流感测电阻组件相关规格。

This specification covers HFPL0603-series, which are Metal Foil Current Sensing Resistor.

### 2. 产品型号 / TYPE NUMBER

<b>HFPL</b>	<b>0603</b>	<b>M</b>	<b>W33</b>	<b>Rxxx</b>	<b>*</b>
	(1)	(2)	(3)	(4)	(5)

- (1) 产品系列号 / SERIES NUMBER : Ex.HFPL0603= 长电极 / Long electrode ; 四端子 / four terminal ; 无侧导 / without side electrode ; 尺寸 / size “0.06×0.03”
- (2) 产品材质 / Material : M = 锰铜合金 / MnCu alloy
- (3) 产品瓦特数 / Power Rating : Ex. W33=0.33 Watt
- (4) 产品阻值 / Nominal Resistance Value : Ex. 5mΩ → R005
- (5) 组件电阻偏差值 / Resistance Tolerance : Ex. D=±0.5% ; F=±1%



### 3. 产品尺寸 / PRODUCT DIMENSIONS

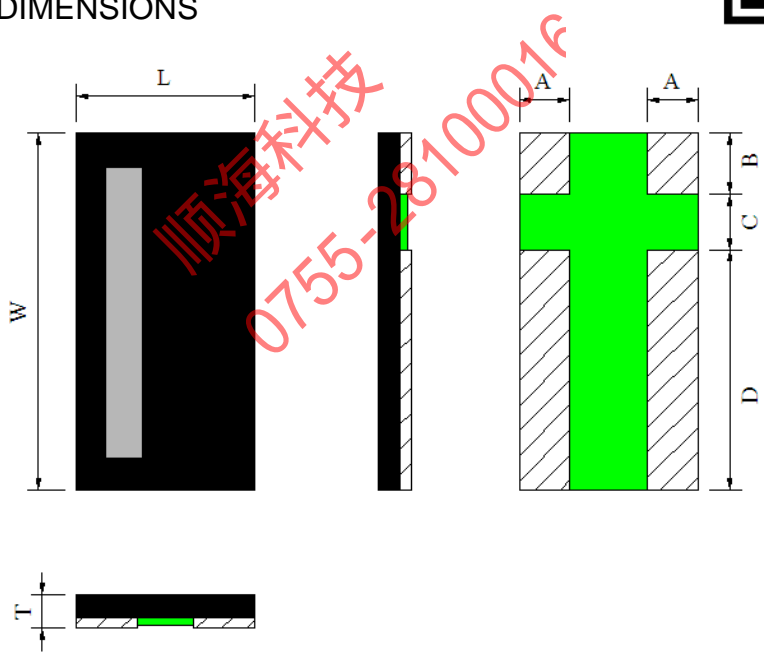


圖 1 / Fig.1

Unit(mm)

Part Number	W	L	A	B	C	D	T
HFPL0603MW33-series 2M50~R005	1.60±0.20	0.80±0.15	0.20±0.10	0.25±0.10	0.40±0.10	0.95±0.20	0.33±0.10

4. 产品结构及使用材料说明 (参考图 2) / STRUCTURE & MATERIAL (Ref to Fig.2)

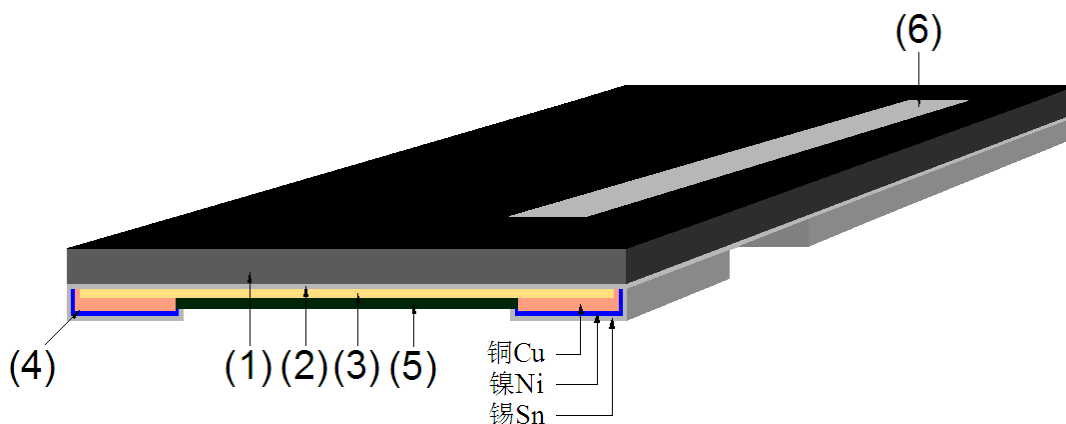
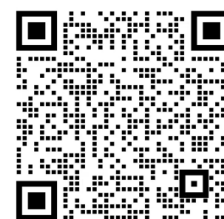


图 2 / Fig.2



- 4.1 基板 / Substrate(1) : 環氧樹脂 / epoxy
- 4.2 粘著膠層/Adhesive(2): 環氧樹脂 / epoxy
- 4.3 電阻本體 / Resistive element(3) : 銅合金 / Cu - alloy
- 4.4 端電極 / Terminal electrode(4) : 錫、鎳、銅 / Sn、Ni、Cu
- 4.5 保護防焊層 / Protective coating(5) : 防火級環氧樹脂,符合 UL- 94-V0 要求(绿色) /  
Flame-retardant epoxy, meets UL- 94-V0 requirements (green)
- 4.6 文印防焊層 / Marking coating(6) : 防火級環氧樹脂,符合 UL- 94-V0 要求(白色) /  
Flame-retardant epoxy, meets UL- 94-V0 requirements (white)

5. 电气特性 / ELECTRICAL CHARACTERISTICS

Part Number	Resistance Value (mΩ)	Power Rating (Watt)	Resistance Tolerance (%)	TCR (ppm/°C)
HFPL0603MW33-series 2M50~R005	2.5~5	0.33	±2%(G)/±1%(F)	±100

规格外阻值可依客户需求提供 / We can provide other resistance value per request

6. 产品特性及信赖性测试规范 / PRODUCT CHARACTERISTICS AND RELIABILITY TEST STANDARD

測試方法 Parameter	條件 Conditions	允收標準 Requirements
瞬間過載測試 / Short Time Over Load	$P = 2.5P_r$ ; $T = 25 \pm 2^\circ\text{C}$ , $t = 5\text{sec.}$	$\pm(1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.13
高溫測試 / High Temp. Exposure	$T = +155 \pm 2^\circ\text{C}$ ; $t = 1000\text{h}$	$\pm(1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.25

低溫測試 / Low Temp. Storage	T = -55±2°C ; t = 1000h	±(1.0%+0.5mΩ) IEC60115-1 4.25
濕度負載壽命測試 / Moisture Load Life (60°C、95%RH)	V <sub>test</sub> = V <sub>max</sub> ; T=60±2°C ; RH=95% ; t= 90min ON , 30min OFF , 1000h	±(2.0%+0.5mΩ) IEC60115-1 4.25
冷熱衝擊測試 / Thermal Shock	[-55°C 30min. → R.T. 3min. → +155°C 30min. → R.T. 3min ], 100 個連續循環 / 100Cycles	±(1.0%+0.5mΩ) IEC60115-1 4.19
在 70°C 下負載壽命測試 / Load Life at 70°C	V <sub>test</sub> = V <sub>max</sub> ; T=70±2°C ;t= 90min ON , 30min OFF,1000h	±(2.0%+0.5mΩ) IEC60115-1 4.25
可焊性測試 / Solderability	浸入錫爐 / Dip into solder at T = 245±5°C , t = 3±1sec.	錫涵蓋面積/The covered area >95% IEC60115-1 4.17
抗焊熱性測試 / Resistance to Solder Heat	經熱風式迴焊爐 / Through Reflow Parts are subjected to 3 reflow cycles.	±(1.0%+0.5mΩ) IEC60115-1 4.18
機械衝擊測試 / Mechanical Shock	加速度 a =100G , 振幅時間 t =6ms a =100G , t =6ms	±(1.0%+0.5mΩ) IEC60115-1 4.21
基板彎曲測試 / Substrate Bending	兩支撐點間距 / Span between fulcrums : 90mm ; 振幅 / Bend Width: 2mm ; 測試板/Test board: 玻璃纖維板/ Glass-Epoxy Board: 厚度 / Thickness : 1.6mm	±(1.0%+0.5mΩ) IEC60115-1 4.33

### 7. 环境特性 / ENVIRONMENTAL CHARACTERISTIC

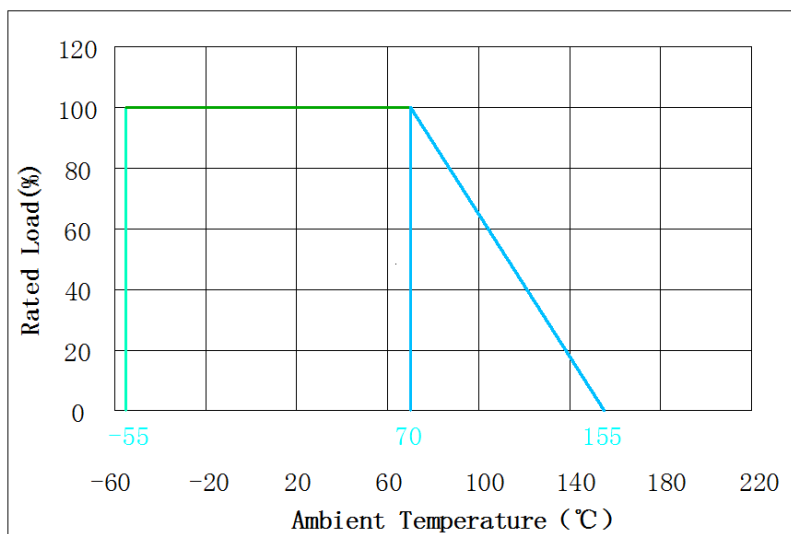
#### 7.1 操作温度范围: -55°C ~ 155°C / Operating Temperature: -55°C ~ 155°C

##### 额定功率温度衰变曲线 / Typical Thermal Derating Curve

额定功率乃指于 70 °C 以内可连续满额功率使用的术语。

下图为当操作温度高于 70°C 时的可使用功率衰减曲线。

Power rating is based on continuous full load operation at rated ambient temperature of 70 °C. For resistors operated at ambient temp. in excess of 70 °C, the max. load shall be derated in accordance with the following curve.



### 7.2 存储条件 / STORAGE CONDITIONS

在温度+10℃~40℃、相对湿度≤75%的密闭条件下可存放2年。 /

Under airtight in temperature+10℃~40℃、relative humidity ≤75% can store 2 years.

在温度+10℃~60℃、相对湿度为95%的非露天下最多可存放30天。 /

Without dew in temperature+10℃~60℃、relative humidity be 95% maximum value for 30days.

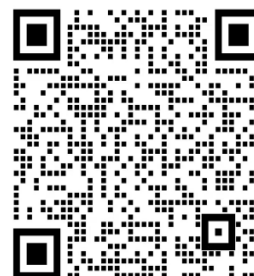
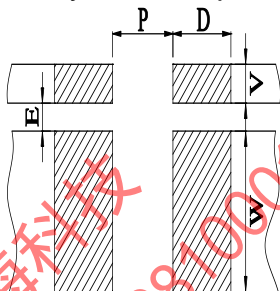
### 8. 焊锡垫尺寸及焊接条件 / SOLDER PAD SIZE AND WELDING CONDITIONS

8.1 建议如下图焊接方式焊接，并满足所要求的尺寸。 /

Propose that the following picture installation way is installed, and satisfied the required size.

Part Number	P	W	D	V	E	Loading
HFPL0603MW33-series	0.35mm	1.30mm	0.40mm	0.40mm	0.20mm	0.33W

loading : 适用于本公司建议焊垫设计并用于限定稳定电流下 /  
suit for specific pad layout and specific steady current



### 8.2 建议客户焊接参数 / Recommended Customer Soldering Parameters

#### 8.2.1 回流焊温度曲线 / Solder reflow Temperature condition (图 3 / Fig.3)

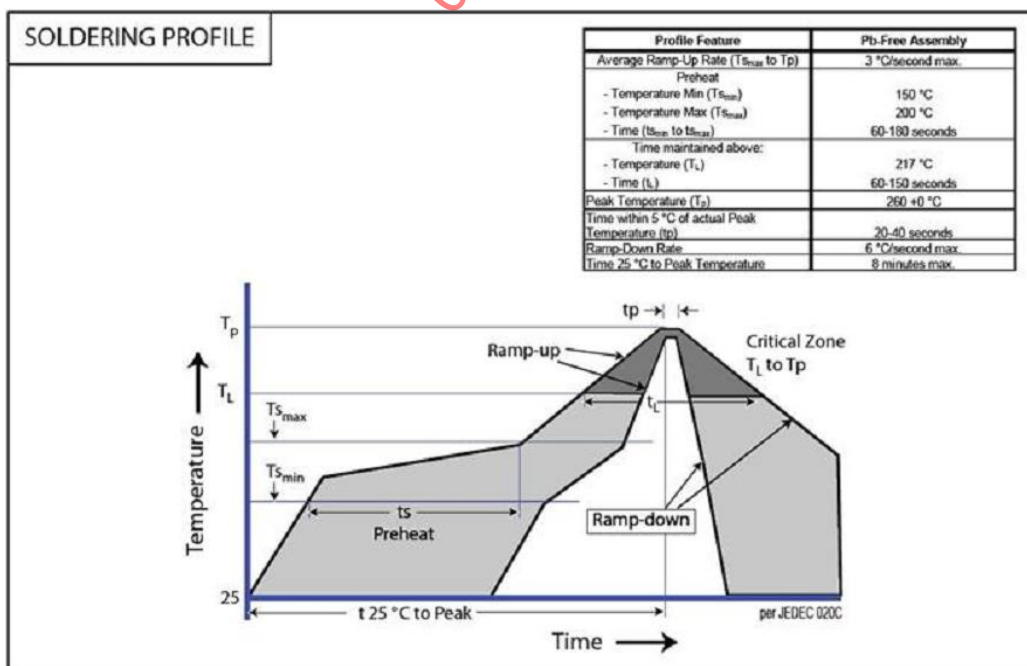


图3 / Fig.3

8.2.2 允许烙铁焊接条件(热风设备) / Rework temperature (hot air equipment) : 350°C,  
3~5seconds

8.2.3 焊接方法建议 / Recommended reflow methods

焊接热源方式可用红外线, 热蒸气, 热风. / IR, vapor phase oven, hot air oven  
如果焊锡温度超过允许最高温度, 则产品本身会有功能损坏的疑虑. / If reflow temperatures  
exceed the recommended profile, devices may not meet the performance requirements.

## 9. 批量生产后出货测试项目 / Lot ACCEPTANCE TEST REQUIREMENTS

每一批生产均须作入库检验, 每一批生产单量不可超过500Kpcs. /  
Qualification shall consist of passing a program of following tests. Parts shall be pulled from  
each lot and maximum lot quantity shall be within 500Kpcs.

### 9.1 外观 / Visual

方法 / Procedure : 利用放大镜进行检查 / Visual  
标准 / Acceptance Criteria : 不能有脏污、不洁、文印错误、破损等 / No parts are outstandingly  
stained

### 9.2 尺寸 / Dimensions

方法 / Procedure : 使用合适且经校正的标尺 / As appropriate, calipers, micrometers,  
optical comparator, or approved gages  
标准 / Acceptance Criteria : 尺寸均在规范标准范围内 / No parts outside specific dimensions

### 9.3 单体组件电阻(Ro) / Resistance (Ro)

方法 / Procedure : 在 25°C 下利用四线量测技术量测之 / Resistance shall be measured with  
25°C in the 4-wire resistance test  
标准 / Acceptance Criteria : 电阻值均在规范标准范围内 / The resistance of the test device shall  
be within the limits specified

### 9.4 电阻温度系数 / TCR

方法 / Procedure : 利用四线法量测出组件分别在 25°C 及125°C 下的电阻值, 并将其带入下面公  
式中即可得出 TCR值 / Getting the sampling device resistance values measured in 25°C and  
125°C and put them in to the following equation to calculate the TCR  
标准 / Acceptance Criteria : 温度系数值均在规范标准范围内 / All parts must within the specific  
$$TCR = (R_b - R_a) / R_a \times 1 / (T_b - T_a) \times 10^6$$

### 9.5 绝缘电阻 / Insulation resistance (Ri)

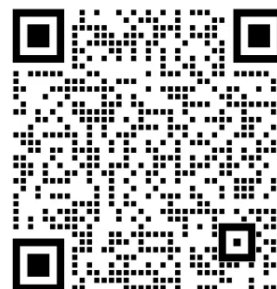
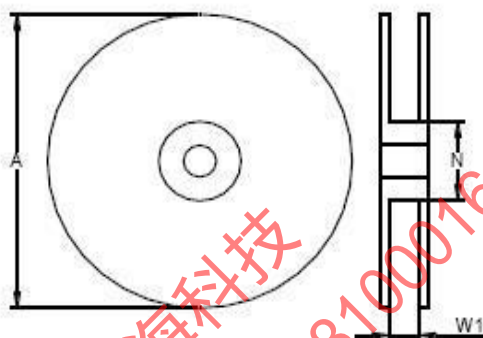
方法 / Procedure : 利用绝缘测试仪器量测 / Resistance between protective layer and resistive shall  
be measured by high ohm meter  
标准 / Acceptance Criteria : 防焊层与电阻本体绝缘电阻至少高于100MΩ / The resistance of the  
test device shall over 100MΩ

10. 包装讯息 / PACKAGING INFORMATION

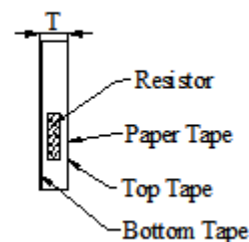
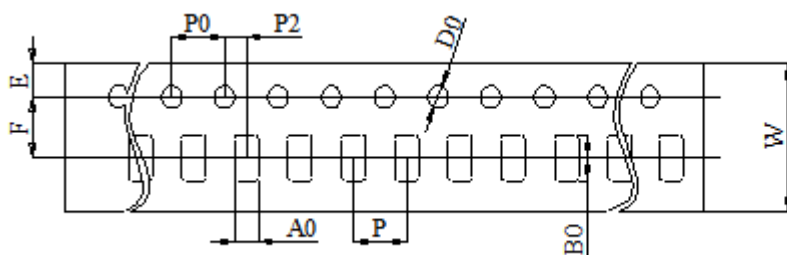
10.1 包装数量、重量 / QUANTITY & WEIGHT

型号 / Type Number	数量 / Quantity (pcs)	重量 / Weight (g)
HFPL0603MW33-series	5,000	130±40

10.2 卷轮规格 / Reel & Tape specifications



型号 / Type Number	A ± 5 (mm)	N ± 2 (mm)	W1 ± 1 (mm)
HFPL0603MW33-series	178	60	9.0



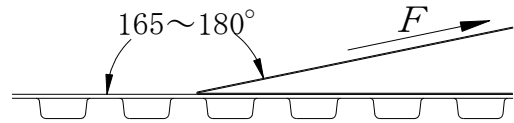
Unit(mm)

HFPL0603MW33-series							
W	8.00 ± 0.30	P0	4.00 ± 0.10	P	4.00 ± 0.10	P2	2.00 ± 0.10
A0	0.98 ± 0.20	B0	1.85 ± 0.20	D0	1.50 ± 0.10	F	3.50 ± 0.10
E	1.75 ± 0.10	T	0.60 ± 0.10	/	/	/	/

### 10.3 密封胶膜剥离强度要求 / Peeling Strength of Seal Tape

F = 剥离强度 : 0.1 – 1.0N ( 10 - 100gf )

F = Peeling Strength: 0.1 – 1.0N (10 - 100gf )



### 11. 其他 / OTHERS

- 11.1 如果在使用中有超出本规格书的要求，必须经由双方协商确认。 / In the event that an impropriety is found beyond this specification ,it shall be fixed by mutual agreement between the parties.
- 11.2 如果本规格书有不适当的情况，必须通过双方协商并由本公司修改。 / In the event that an impropriety is found in this specification , Juneway Electronic Technology Co., Ltd. shall amend it by mutual agreement between the parties.

顺海科技  
0755-28100016

