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1. 適用範圍 Specification

1-1 本承認書僅適用本公司生產之各種 MEMF 金屬皮膜無腳電阻器產品。

The specification is only suitable for MEMF—MELF resistors manufactured by SHI MENG ELECTRONIC CO., LTO.

1-2 參考標準 Applicable specification

本承認書參考《JIS C5201-2011》、《GB/T5729-2003/IEC60115-1:2001》、《AEC-Q200》標準。

The specification Applicable specification《JIS C5201-2011》、《GB/T 5729-2003/IEC60115-1:2001》、《AEC-Q200》。

2. 特征及应用 Features and Applications

■ 特征 Features

- Thin film technology
- AEC-Q200 Compliance
- Excellent overall stability
- Sn termination on Ni barrier layer
- Tight tolerance down to ± 0.1
- Extremely low TCR down to $\pm 5\text{PPM}/^{\circ}\text{C}$
- High power rating up to 2 Watts
- SMD enabled structure
- Lead-free and RoHS compliant

■ 应用 Applications

- Automotive(non-safety parts)
- Industrial
- Telecommunication
- Medical Equipment
- Measurement/Testing Equipment

3. 訂貨方式 How To Order

2-1 訂貨方式 How To Order

如: MEMF 金屬皮膜無腳電阻器 0204 1/4WS $\pm 1\%$ 100 Ω 溫度係數 $\pm 25\text{PPM}$

Example: MEMF---MELF 0204 1/4WS $\pm 1\%$ 100 Ω TC25

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4. 術語 Glossary

產品類型依種類、功率、型式、特性、標稱電阻及電阻值容許差等排列構成。

The manufactured type constituted by kind、power、characteristic、rated resistance and resistance tolerance.

4-1-1 名稱 Code:

以大寫英文字母 “MEMF” 表示為金屬皮膜無腳電阻器。

MEMF-MELF Resistors are marked with “MEMF” 。

4-1-2 標稱阻值 Rated resistance

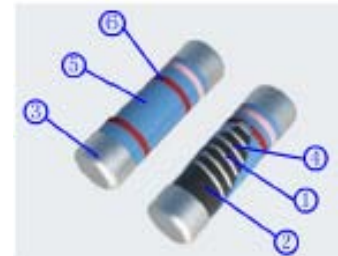
Unit: Ω 、 $K\Omega(10^3\Omega)$ 、 $M\Omega(10^6\Omega)$ 等。

4-1-3 電阻值容許差 Resistance tolerance:

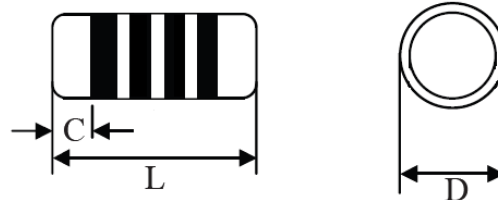
B($\pm 0.1\%$)、D($\pm 0.5\%$)、F($\pm 1\%$)、G ($\pm 2\%$)、J($\pm 5\%$) and K($\pm 10\%$)。

5. 構造 Construction

- ①瓷棒 ceramic base
- ②金屬膜 metal film
- ③鍍錫鐵帽 Tin-plated steel caps
- ④切割槽紋 Trimming line
- ⑤絕緣樹脂 Insulating resin
- ⑥色碼標示 Marking



6. 尺寸 Dimension



TYPE	Dimensions (mm)		
	L	ΦD Max	C Min
0102	2.2 $\pm$ 0.1	1.20	0.45
0204	3.5 $\pm$ 0.2	1.55	0.70
0207	5.9 $\pm$ 0.2	2.40	0.80

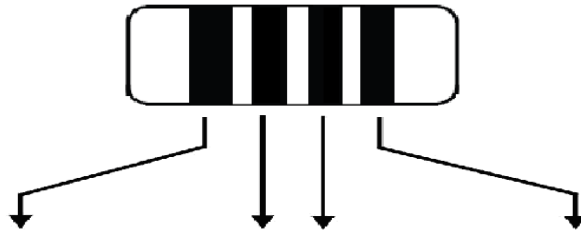
7. 色碼標示 Explanation of color

底漆: 藍色 Coating color: Blue

$\pm 0.1\%, \pm 0.5\%, \pm 1\%$

四色環標示

Marking: 4 Color code

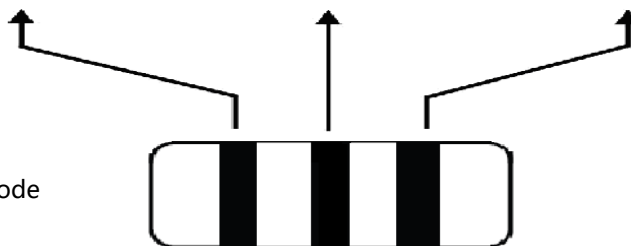


顏色 COLOR	第一位數 1ND BAND	第二位數 2ND BAND	第三位數 3ND BAND	乘數 MULTIPLIER
黑 BLACK	0	0	0	1×
棕 BRAWN	1	1	1	10×
紅 RED	2	2	2	100×
橙 ORANGE	3	3	3	1000×
黃 YELLOW	4	4	4	10000×
綠 GREEN	5	5	5	—
藍 BLUE	6	6	6	—
紫 VIOIET	7	7	7	—
灰 GRAY	8	8	8	—
白 WHITE	9	9	9	—
金 GOLD				0.1×
銀 SILVER				0.01×

$\pm 2\%, \pm 5\%$

三色環標示

Marking: 3 Color code

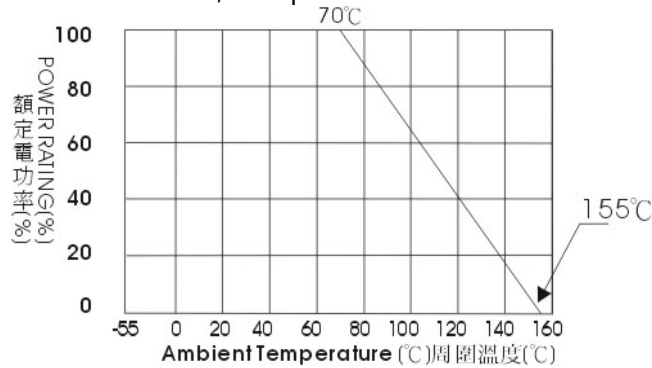


注：0Ω用一道黑色表示 Notice: 0Ω mark with one Black color

8. 負載減輕曲線 Power Derating Curve

額定功率系適應在周圍溫度 70°C 可以連續負載的最大功率(如表),但周圍溫度如超過 70°C 時之額定電力則依圖的降功率曲線實施。

Rated power is maximum power which can be continuously loaded at specified ambient temperature 70°C, however when the ambient temperature exceeds 70°C, rated power should be determined from the derating curve



9. 電氣特性 Characteristics

■ 標準品特性 Standard Characteristics

Item Type	Rated power at 70°C 額定功率 at 70°C	Operating temp range 使用溫度 範圍(°C)	Max continuous working voltage 最高工作 電壓	Max overload voltage 最高過負荷 電壓	Range of resistance value 阻值範圍		T.C.R. PPM/°C 溫度係數
					±0.1%、±0.25%	±0.5%、±1%	
0102	1/5W	-55~155	150V	300V	-	8.2Ω~470KΩ	±50
0204	1/4W Jumper : 2A	-55~155	200V	400V	33Ω~100KΩ(±15PPM)		±15
					33Ω~510KΩ(±25PPM)		±25
					1Ω~1MΩ		±50
					1Ω~3MΩ		±100
0207	1/2W Jumper : 4A	-55~155	300V	600V	33Ω~100KΩ(±15PPM)		±15
					33Ω~510KΩ(±25PPM)		±25
					1Ω~1MΩ		±50
					1Ω~3MΩ		±100
					0Ω<20mΩ		-

■ 高功率品特性 High Power Rating Characteristics

Item Type	Rated power at 70°C 額定功率 at 70°C	Operating temp range 使用溫度 範圍(°C)	Max continuous working voltage 最高工作 電壓	Max overload voltage 最高過負荷 電壓	Range of resistance value 阻值範圍		T.C.R. PPM/°C 溫度係數
					±0.1%、±0.25%	±0.5%、±1%	
0204	2/5W	-55~155	200V	400V	33Ω~510KΩ		±25
					1Ω~1MΩ		±50
					1Ω~3MΩ		±100
0207	1W	-55~155	350V	700V	33Ω~510KΩ		±25
					1Ω~1MΩ		±50
					1Ω~3MΩ		±100

10. 性能 Performance

測試項目 Item	測試要求 Requirement	測試步驟 Test Method
電阻溫度係數試驗 Temperature Coefficient	As Spec.	IEC-60115 -14.8, -55 °C~+125 °C , 25°C is the reference temperature.
高溫儲存 High Temperature Storage	±0.15%	MIL-STD-202 Method 108 1,000 hrs. @T=125°C Unpowered. Measurement at 24±4 hrs., after test conclusion.
短時間過附載試驗 Short Time Overload	±(0.5%+0.05Ω)	IEC-60115 -14.13 RCWV×2.5 or Max. Overload voltage for 5 seconds.
壽命負載試驗 Endurance	±(1.0%+0.05Ω)	MIL-STD-202 Method 108 70±2°C, RCWV or Max. Operating voltage for 1,000 hrs. (with 1.5 hrs. ON and 0.5 hrs. OFF).
偏高濕度(雙 85 測試) Biased Humidity	10Ω-300K: (±0.5%+0.05Ω) <10Ω&>300K: (±1%+0.05Ω) 0102: ±2%	MIL-STD-202 Method 108 1,000 hrs. 85°C/85%RH 10% RCWV. Max=100V
板彎曲試驗 Bending Strength	±(0.5%+0.05Ω)	AEC-Q200-005 Bending once for 60 seconds with 2mm
端子強度 Terminal Strength	No broken	AEC-Q200-006 Force of 1.8kg for seconds
焊錫性試驗 Solder ability	95% min. Coverage	IEC-61115-14.17 245±5°C for 3 seconds.
焊錫耐熱性試驗 Resistance to Soldering Heat	±(0.5%+0.05Ω)	MIL-STD-202 Method 210 260±5°C for 10 seconds.
絕緣耐壓試驗 Voltage Proof	No breakdown or flash-over	IEC-60115-1 4.7 1.42 times Max. Operating Voltage for 1 minute .
靜電放電 ESD	±(0.5%+0.05Ω)	AEC-Q200-002 Human body, 0102/0204: 2KV ; 0207: 4KV
振動測試 Vibration	(±0.5%+0.05Ω)	MIL-STD-202 Method 204 5 g's for 20 min., 12 cycles each of orientations. 10-2000Hz..
溶劑抵抗 Resistance to Solvents	No visible damage on appearance And marking	MIL-STD-202 Method 215 Add Aqueous wash chemical – OKEM Clean or equivalent. Do not use banned.
絕緣電阻試驗 Insulation Resistance	>1,000MΩ	IEC-60115-1 4.6 Max. overload voltage for 1 minute.
Flammability 可燃性	No ignition of the tissue paper or scorching or the pinewood board	UL-94 V-0 or V-1 are acceptable. Electrical test not required.
機械衝擊 Mechanical Shock	±(0.25%+0.05Ω)	MIL-STD-202 Method 213 Wave form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6.
高低溫度迴圈試驗 Temperature Cycle	±(0.5%+0.05Ω) 0102: ±1%	JESD22 Method JA-104 1,000 cycles (-55°C to+125°C)

* RCWV (Rated Continuous Working Voltage)

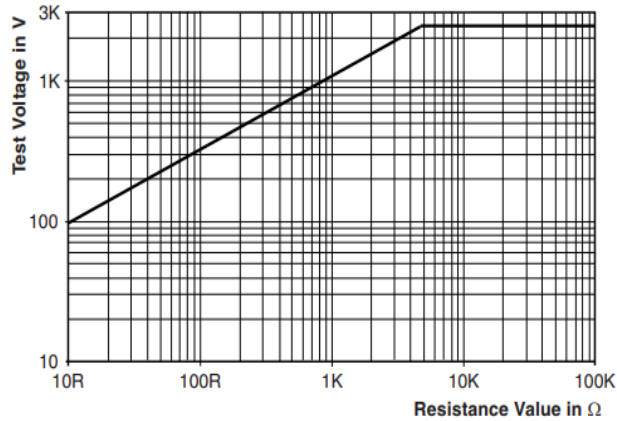
* 工作電壓 RCWV =(電阻額定功率×公稱電阻值)開根號或法定最高使用電壓。

* 短時間過負荷電壓=(電阻額定功率×公稱電阻值)開根號×2.5 倍或法定最高短時間過負荷電壓。

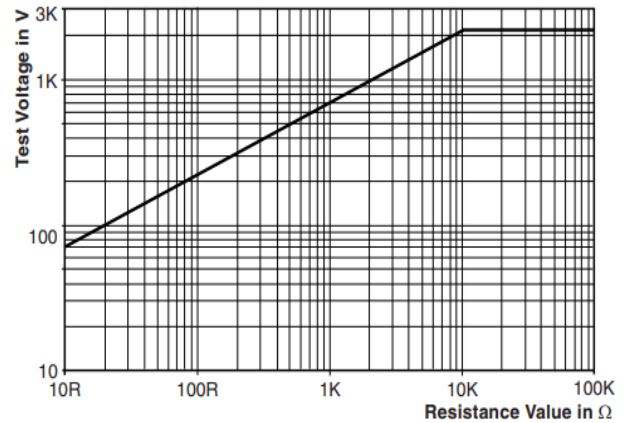
* 測試標準參考/Reference Standards: IEC 60115-1; JIS-C 5201-1.

* 儲存環境條件/ Storage Temperature: 25±3°C; Humidity < 80% RH.

■ 脈衝特性 Pulse Characteristics

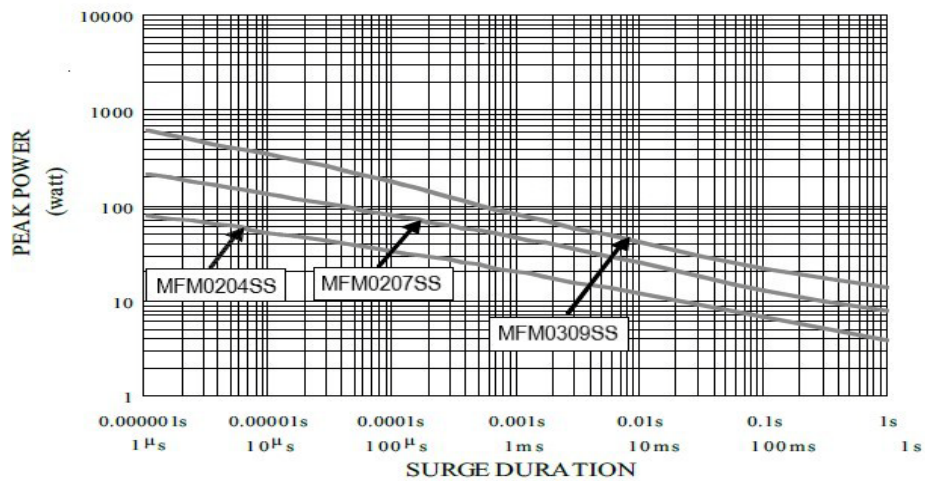


脈衝負載額定值符合 IEC60115-1,4.27; 1.2/50u ;
載入一個脈衝。(僅適用在 0207)

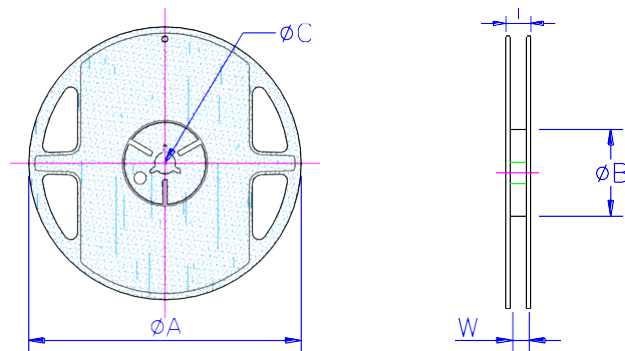


脈衝負載額定值符合 IEC60115-1,4.27; 10/700u ;
載入一個脈衝。(僅適用在 0207)

■ 單次浪涌性能 SINGLE SURGE PERFORMANCE

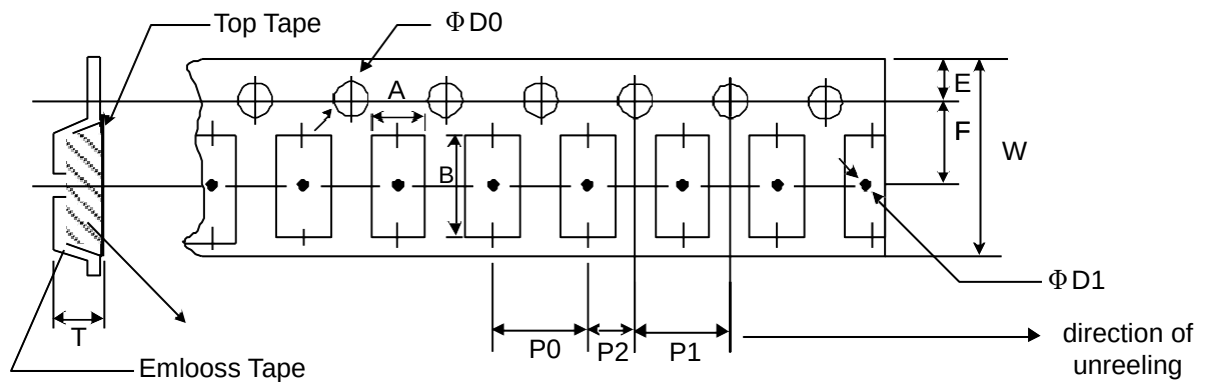


11. 包裝方式 Tape packing in every box



Packaging Quantity & Reel Specifications

Type	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)	Emboss Plastic Tape (EA)
0102	7 inch	178.5±1.5	60.0±1.0	13.0±0.2	9.0±0.5	12.5±0.5	3,000
0204	7 inch	178.5±1.5	60.0±1.0	13.0±0.2	9.0±0.5	12.5±0.5	3,000
0207	7 inch	178.5±1.5	60.0±1.0	13.0±0.5	13.0±0.5	15.5±0.5	2,000

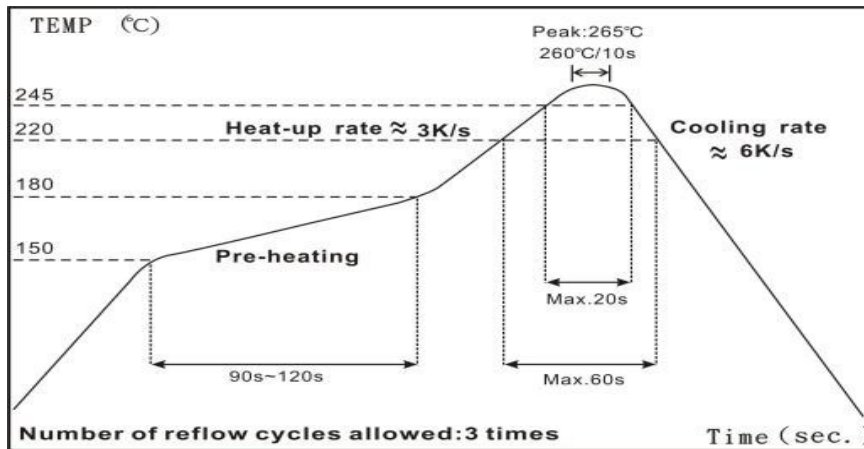


Emboss Plastic Tape Specifications

Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P0 (mm)	P1 (mm)	P2 (mm)	ΦD0 (mm)	T (mm)
0102	1.30±0.10	2.40±0.10	8.0±0.10	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	1.45±0.10
0204	1.30±0.10	3.70±0.10	8.0±0.10	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	1.45±0.10
0207	2.40±0.10	6.30±0.10	12.0±0.10	1.75±0.10	5.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	2.50±0.10

12. 建議 Suggestion

12.1 無鉛迴流焊條件 Reflow soldering (lead-free)



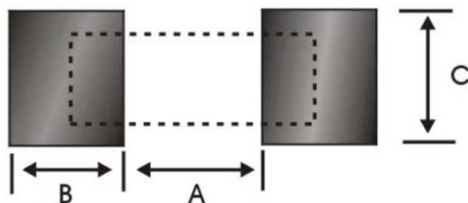
IR Reflow Soldering

回流焊

- (1) Time of IR reflow soldering at maximum temperature point 260°C: 10s
回流焊在最高溫度點時間 (260°C) :10 秒
- (2) Time of soldering iron at maximum temperature point 410°C: 5s
烙鐵在最高溫度點時間 (410°C) :5 秒

12.2 焊盤設計 Pad design

Recommend Land Pattern



TYPE	A(mm)	B(mm)	C(mm)
0102	1.0	0.8	1.5
0204	1.6	2.0	2.2
0207	3.2	3.0	3.5

13. 注意事項 Caution

- 13.1 Storage and usage method
- 13.2 Humidity gives damage to cap solderability, therefore, please keep environment.
Temperature : +5°C~+40°C
Humidity : 55%~75%RH
Storage limited : 24 months
- 13.3 Please follow the instruction to keep the material when it is unpacked.
- 13.4 When ambient temperature exceeds a rated ambient temperature, the resistance shall be applied on the derating curve by derating the load power.
- 13.5 Please avoid join many resistors in series or parallel when apply high voltage or high electric current.
- 13.6 Molding products by using resin might bring out resistance value change. Please keep away from Molding.
- 13.7 This products meet the RoHS Compliant.