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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金屬氧化膜固定電阻器 (1/8W、1/6W、1/4W、1/2W、1W、2W、3W、5W)及其小型化之成品規格。

The specification is only suitable for Metal Oxide Film Fixed Resistors (1/8W、1/6W、1/4W、1/2W、1W、2W、3W、5W)and there are small size manufactured by SHI MENG ELECTRONIC CO., LTD.

1-2 參考標準 Applicable specification

本承認書參考《JIS C5202-1990》和《GB/T 5729-2003/IEC 60115-1:2001》

The specification Applicable specification 《JIS C5202-1990》 and 《GB/T 5729-2003/IEC 60115-1:2001》

2. 特性 Feature

2-1 優異不燃性封裝 Excellent flame retardant coating

2-2 過負荷能力強 Overload capability

2-3 耐溫、抗氧化、熱穩定性好 Good performance in moisture resistance, anti-oxidization, Good thermal stability

3. 品名 Part Number

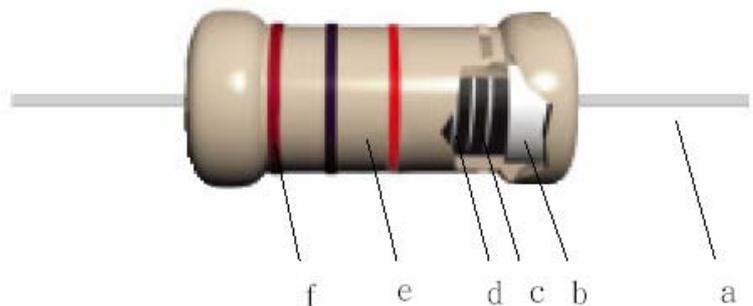
依據其種類，分別注明額定功率、容許差、公稱電阻值和形狀。

According the Resistors type, To mark the Rated power, Tolerance, Resistance value, and forming type.

例(e.g):	MO	2W	J(±5%)	100Ω	T73
	種類	額定功率	容許差	阻值	形狀
	Type	Rated power	Tolerance	Resistance	Forming

4. 結構圖 Construction

- a) 鍍錫銅導線或鍍錫銅包鋼線 Tinned copper lead wire or CP lead wire
- b) 鍍錫鐵帽 Tin-plated steel caps
- c) 高穩定性導電膜 High stability Electric conduction film
- d) 高熱傳導瓷棒 High heat exchanged ceramic base
- e) 硅樹脂塗料 Silicon resin coating
- f) 色環標示 Color ring Mark





5. 術語 Glossary

5-1 種類 Type

以大寫英文字母“MO”表示為金屬氧化膜電阻器。

Metal Oxide Film Fixed Resistors are marked with “MO”

5-2 標稱阻值 Rated resistance

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

5-3 電阻值容許差 Resistance tolerance:

F($\pm 1\%$)、G($\pm 2\%$) and J($\pm 5\%$)

5-4 額定功率：在 70°C 環境溫度下進行 70°C 耐久性試驗，而且阻值變化不超過該試驗的允許值時所允許的最大功率

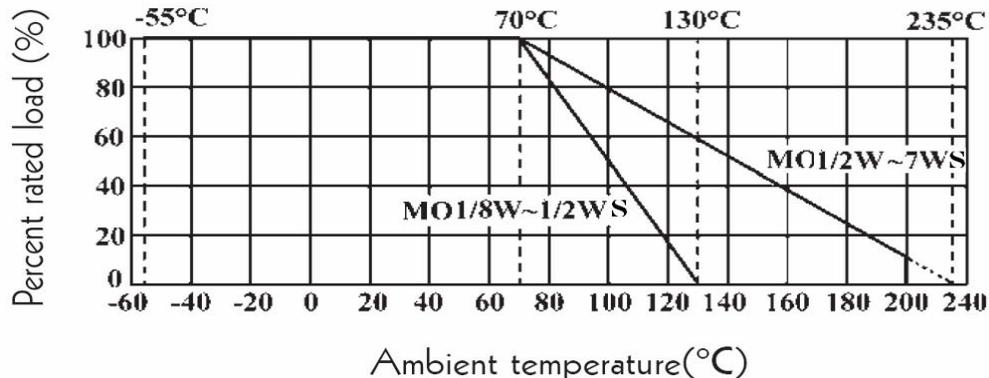
Rated power: At 70 °C to 70 °C ambient temperature durability test, and the change in resistance does not exceed the value of the test allows the maximum power allowed

5-4-1 以“W”代表額定電功率，如加一英文字母“S”即表示小型化，例 1/4WS，即表示額定功率為 1/4W 之小型化

The “W” is the rated power, such as adding a letter "S" means that small, for example 1/4WS, that means a power rating of 1/4W the small Size

5-4-2 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，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



5-5 額定電壓：用標稱阻值和額定功率乘積的平方根計算出來的直流電壓或交流電壓有效值。由於電阻器的尺寸和結構上的原因，在超過一定的高阻值時不允許施加額定電壓，而是應施加最高使用電壓。

Rated voltage: The nominal resistance and power rating calculated by the square root of the product of DC voltage or AC rms voltage. As the resistor size and structural reasons, the high resistance when more than a certain rated voltage is not allowed, but the maximum operating voltage should be applied.

5-6 最高使用電壓：可以連續施加在電阻值兩個引出端上的最大直流或交流電壓有效值，當電阻的額定電壓計算出來大於最高使用電壓時，只能對電阻施加最高使用電壓。

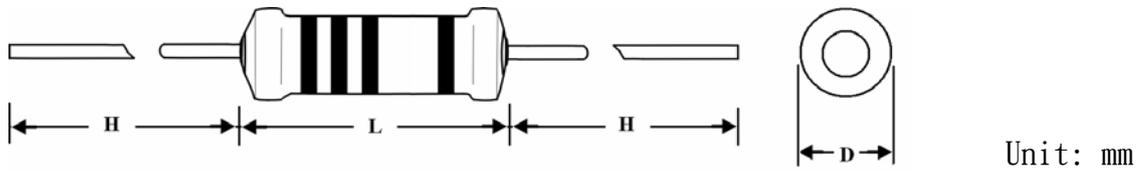
Max continuous working voltage: resistance can be continuously applied to the two terminals on the DC voltage or AC rms voltage, when the resistance is greater than the maximum rated voltage is calculated using the voltage, use only the highest voltage applied to the resistance

5-7 電阻溫度係數：兩個規定溫度之間的阻值相對變化除以產生這個變化的溫度之差，主要用來衡量電阻值隨溫度變化而變化的特性

Temperature coefficient of resistance: The resistance between the two provisions relative changes in temperature produces this change by dividing the temperature difference is mainly used to measure the resistance changes with temperature characteristics



6. 尺寸 Dimension



Type \ Size	L±0.5	D±0.5	H±3	d±0.06	Resistance range	Tolerance
1/6W 1/8W 1/4WS 1/2WSS	3.5	1.7	27	0.40	0Ω~1MΩ	±5%
1/4W 1/2WS 1WSS	6.5	2.4	27	0.43	0Ω~2MΩ	
1/2W 1WS 2WSS	9.2	3.3	26	0.50	0Ω~2MΩ	
1W 2WS	11	4.5	22/28/35	0.65	0.1Ω~2MΩ	±2%
2W 3WS	15	5.0	34	0.75	0.1Ω~2MΩ	±1%
3W 5WS	18	6.0	33	0.75	0.1Ω~2MΩ	
5W 7WS	25	8.0	38	0.75	0.1Ω~2MΩ	

注：①引線根部腳漆長度小於1.5mm

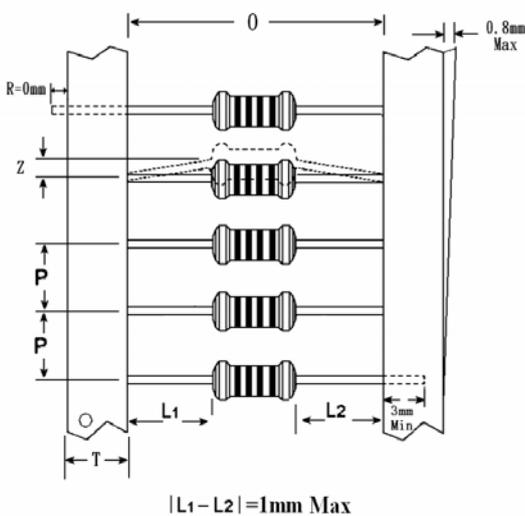
Lead paint the roots of the foot length is less than 1.5mm

②0Ω阻值範圍為<50mΩ

0Ω Resistance Value <50mΩ

7. 成型方式 Forming type

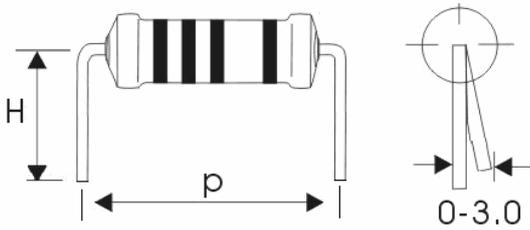
7-1 Tape packing



STYLE	TYPE	0	P	T	Z	最小包裝數
T-26	1/8W 1/6W 1/4WS 1/2WSS	26 ^{+1.5} ₋₀	5±0.5	5±1	1max	5000pcs
	1/2WS 1/4W 1WSS	26 ^{+1.5} ₋₀	5±0.5	5±1	1max	5000pcs
T-52	1/8W 1/6W 1/4WS 1/2WSS	52±1	5±0.2	5±1	1max	5000pcs
	1/2WS 1/4W 1WSS	52±1	5±0.2	5±1	1max	5000pcs
	1WS 1/2W 2WSS	52±1	5±0.2	5±1	1max	2000pcs
	1W 2WS	52±1	5±0.2	5±1	1max	1000pcs
T-63	1W 2WS	63±2	5±0.5	5±1	2max	1000pcs
T-73	1W 2WS	73±2	5±0.5	5±1	2max	1000pcs
	2W 3WS	73±2	5±0.5	5±1	2max	1000pcs
	3W 5WS	73±2	10±0.5	5±1	2max	500pcs



7-2 M-Type

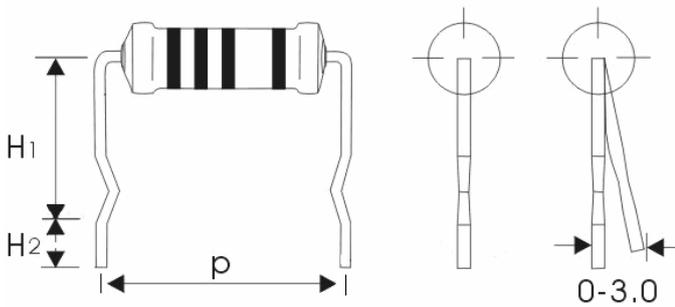


TYPE	P±0.5	H±1
1/8W 1/4WS 1/6W 1/2WSS	5	4/6/8/10
1/4W 1/2WS 1WSS	10	4/6/8/10
1/2W 1WS 2WSS	12.5	4/6/8/10
1W 2WS	15	10
2W 3WS	20	10
3W 5WS	25	10
5W 7WS	30	10

可依客戶所需求尺寸加工製造

It can be manufactured according to the dimension that required by customers

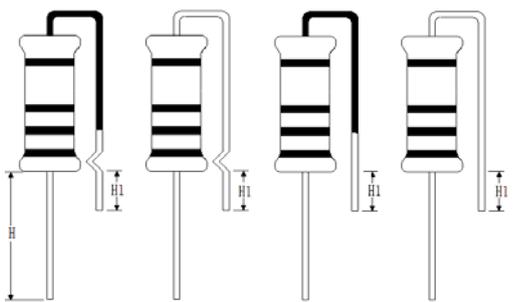
7-3 MK-Type



TYPE	H1±0.5	H2±1
1/4W 1/2WS 1WSS	5/8/13	4/6
1/2W 1WS 2WSS	5/8/13	4/6
1W 2WS	5/8/13	4/6
2W 3WS	5/8/13	4/6
3W 5WS	5/8/13	4/6

注：1/4W 最小腳距為 8mm、1/2W 最小腳距為 12.5mm
1W 最小腳距為 15mm、2W 最小腳距為 20mm
3W 最小腳距為 23mm。

7-4 F-Type

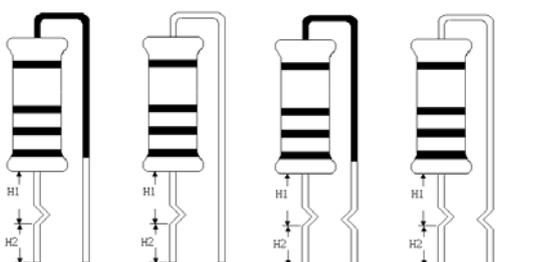


TYPE	H±3	H1±1
1/8W 1/4WS 1/6W 1/2WSS	27 Max	4/6/8/10
1/4W 1/2WS 1WSS	26 Max	4/6/8/10
1/2W 1WS 2WSS	24 Max	4/6/8/10
1W 2WS	22/28 Max	4/6/8/10
2W 3WS	32 Max	4/6/8/10
3W 5WS	32 Max	4/6/8/10

“H1” “H” 部份可剪，但長度不得小於 3.5mm

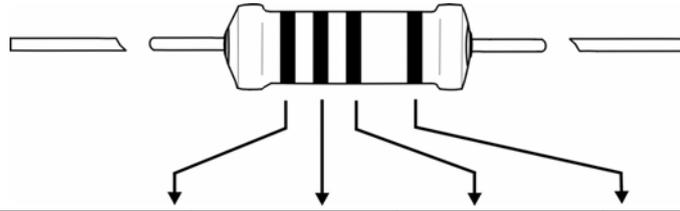
“H1” “H” part can be cut, but can't be small than 3.5mm

7-5 F-Type 直腳打 K

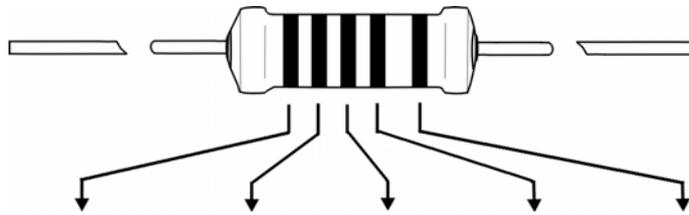


TYPE	H1±0.5	H2±1
1/2W 1WS 2WSS	4/5/6	4/6
1W 2WS	4/5/6	4/6
2W 3WS	4/5/6	4/6
3W 5WS	4/5/6	4/6

8. 色碼 Explanation of color



顏色 Color	第一位數 1ND band	第二位數 2ND band	倍數 Multiple	容許差% Tolerance
Black 黑	0	0	10^0	
Brawn 棕	1	1	10^1	
Red 紅	2	2	10^2	G($\pm 2\%$)
Orange 橙	3	3	10^3	
Yellow 黃	4	4	10^4	
Green 綠	5	5	10^5	
Blue 藍	6	6	10^6	
Violet 紫	7	7	10^7	
Gray 灰	8	8	10^8	
White 白	9	9	10^9	
Gold 金			10^{-1}	J($\pm 5\%$)
Silver 銀			10^{-2}	



顏色 Color	第一位數 1ND band	第二位數 2ND band	第三位數 3ND band	倍數 Multiple	容許差% Tolerance
Black 黑	0	0	0	10^0	
Brawn 棕	1	1	1	10^1	F($\pm 1\%$)
Red 紅	2	2	2	10^2	
Orange 橙	3	3	3	10^3	
Yellow 黃	4	4	4	10^4	
Green 綠	5	5	5	10^5	
Blue 藍	6	6	6	10^6	
Violet 紫	7	7	7	10^7	
Gray 灰	8	8	8	10^8	
White 白	9	9	9	10^9	
Gold 金				10^{-1}	
Silver 銀				10^{-2}	

注：0Ω用一道黑色表示

Notice: 0Ω mark with one Black color



9. 電氣特性 Characteristics

Item	Size									
額定功率 Rated power	1/8W 1/4WS	1/6W 1/2WSS	1/4W 1/2WS	1WSS	1/2W 1WS	2WSS	1W 2WS	2W 3WS	3W 5WS	5W 7WS
最高使用電壓 Max continuous working voltage	200V		250V		350V		350V		500V	
最高過負荷電壓 Max overload voltage	400V		500V		700V		700V		1000V	
耐絕緣電壓 Insulation resistance voltage	300V		350V		500V		500V		700V	
使用溫度範圍 Operating temp range	見 5-4-2 圖									

Note: 額定電壓 rated voltage = $\sqrt{\text{功率 power} \times \text{阻值 resistance value}}$

當計算得出的額定電壓大於最高使用電壓，使用時取兩者較小者

When the calculated rated voltage greater than the maximum operating voltage, whichever is the lesser of use

10. 性能 Performance

特性項 Characteristics	規格值 Specifications	測試方法 Test methods															
溫度係數 T. C. R	±350PPM/°C	$\frac{R2-R1}{R1} \times 10^6 (\text{PPM}) / ^\circ\text{C}$ R1: 常溫(T1)阻抗值. Resistance value at room temperature (T1). R2: 常溫+100°C (T2)阻抗值. Resistance value at room temperature+100°C.															
溫度壽命 Load life	阻抗值變化±(5%R+0.05Ω). 機械特性不可有損傷. Resistance change rat±(5%R+0.05Ω) MAX, With no evidence of mechanical damage.	溫度 70±2°C, 恆溫箱中, 加額定電壓測試 1.5 小時停止 0.5 小時, 連續 1000 小時. Resistance change after 1000hrs operating at rated voltage with duty cycle of 1.5hrs ON 0.5hrs OFF at 70°C±2°C.															
短時間過負荷 Short time over load	±(1%R+0.05Ω)	額定電壓*2.5 倍或最高過負荷電壓 (取小者), 測試 5 秒 2.5 times the rated voltage or maximum overload voltage (whichever is less), testing 5 seconds															
絕緣阻抗 Insulation resistance	1000MΩ 以上 1000MΩ or more	將待測物置於 V 型槽 V-block															
耐絕緣電壓 Electric withstanding voltage	阻抗值變化 ±(0.5%R+0.05Ω) 塗裝不可燒損, 絕緣不可破壞. Resistance change ±(0.5%R±0.05Ω). No evidence of flashover mechanical damage, Arcing or insulation breakdown.	電阻兩端導線置於金屬 V 型槽上, 依特性表之電壓規定印加 60 秒. Resistance shall be clamped in the trough of a 90 metallic v-block and shall be test at specified in the above list for 60 seconds.															
溫度循環 Temperature cycling	阻抗值變化 ±(1%R+0.05Ω) 以內, 機械特性不可有損傷. Resistance change is ±(1%R+0.05Ω) MAX. With no evidence of mechanical damage.	依下表所規定之溫度連續 5 次															
		<table border="1"> <thead> <tr> <th>步驟 Step</th> <th>溫度 Temperature</th> <th>放置時間 Time (MIN)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25°C±3°C</td> <td>30</td> </tr> <tr> <td>2</td> <td>Room temp</td> <td>10-15</td> </tr> <tr> <td>3</td> <td>85°C±2°C</td> <td>30</td> </tr> <tr> <td>4</td> <td>Room temp</td> <td>10-15</td> </tr> </tbody> </table>	步驟 Step	溫度 Temperature	放置時間 Time (MIN)	1	-25°C±3°C	30	2	Room temp	10-15	3	85°C±2°C	30	4	Room temp	10-15
		步驟 Step	溫度 Temperature	放置時間 Time (MIN)													
		1	-25°C±3°C	30													
		2	Room temp	10-15													
3	85°C±2°C	30															
4	Room temp	10-15															



金屬氧化膜電阻器

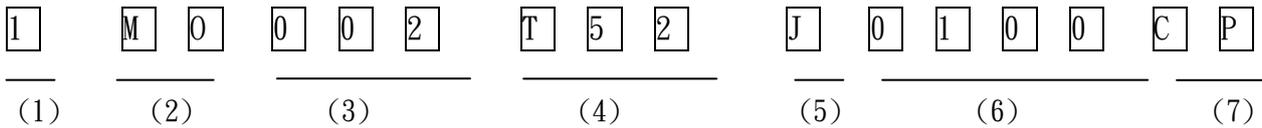
METAL OXIDE FILM RESISTORS

耐熱性 Resistance to soldering heat	阻抗值變化 $\pm(1\%R+0.05\Omega)$. 以內, 機械特性不可有損傷. Resistance change is $\pm(1\%R+0.05\Omega)$. MAX. With no evidence of mechanical damage.	將電阻兩端導線浸入錫爐約 3.2 到 4.8mm 依下表規定實施	
		Temperature	Dip time
		350°C \pm 10°C	3 \pm 0.5 sec
260°C \pm 5°C	10 \pm 1 sec		
焊錫性 Solder ability	百分之 95 覆蓋於導線上 95% coverage minimum	錫爐溫度: 260 \pm 5°C 浸錫時間: 3 \pm 0.5 sec Test temperatures of solder: 260 \pm 5°C Dwell time in solder: 3 \pm 0.5 sec	
接頭強度 Join intensity	接點不得有脫落情形 No terminal wire loosening and breakage shall occur.	夾住導線焊接端, 並向外翻轉 90 度以上 Bending strength 500g load 90° reciprocation twice	

11. 訂貨方式 How To Order

如: 金屬氧化膜電阻器 1/2W T52 \pm 5% 10 Ω

Example: MO 1/2W T52 \pm 5% 10 Ω



代碼 Code	類別 Type
1	Product

代碼 Code	瓦特數 Wattage
008	1/8W
006	1/6W
004	1/4W
002	1/2W
010	1W
020	2W
030	3W
050	5W
070	7W

代碼 Code	含義 meaning
T	Tape / Box
P	Bulk/ Box
Size	
---	Normal size
s	Small size
ss	Super small size
Extent	
26	Tape width 26mm
52	Tape width 52mm
63	Tape width 63mm
73	Tape width 73mm
Molding Size	
M12510	M 型 12.5*10mm
Mk200130	M 型打 Kin 20*13mm
F00	立式成型, 不剪腳
F08	立式成型, 剪腳 8mm
F08U	立式塗腳漆成型, 剪腳 8mm
F08K1U	立式塗腳漆打 KIN 成型, 剪腳 8mm
尺寸方面不一描述, 以此類推	

阻值	Ex.	誤差 \pm 2% \pm 5%
低阻兩位 小數 Ω	0.15 Ω	R150
個位 Ω	1 Ω	0109
十位 Ω	10 Ω	0100
百位 Ω	100 Ω	0101
個位 K	1K	0102
十位 K	10K	0103
百位 K	100K	0104
個位 M	1M	0105
十位 M	10M	0106

代碼 Code	產品類別 Type
MO	金屬氧化膜電阻器 Metal Oxide Film Fixed Resistors

代碼 Code	容許差 tolerance
F	\pm 1%
G	\pm 2%
J	\pm 5%

代碼 Code	含義 meaning
---	不標注為銅引腳
CP	CP 線引腳



12. 使用注意事項 Use notes

1. 金屬氧化膜電阻器於首次通電使用時：會產生發煙情形，屬正常現象敬請安心使用。

Metal oxide film resistors used in the first power: the case will produce smoke, is normal please feel at ease to use.

2. 不燃性塗料符合美國 UL-94 不燃性試驗，V-0 等級，燃燒繼續時間為 0 秒。

Non-flammable paint does not meet U.S. flammability tests UL-94, V-0 rating, burning to the time of 0 seconds.

3. 金屬氧化膜電阻器的塗層硬度雖然高於 3H 鉛筆硬度，但是請勿以螺絲、起子等銳利的物體刻畫。產品儲存搬運請小心輕放，請勿碰撞，防止破損！

Metal oxide film resistors although higher than the hardness of the coating film pencil hardness of 3H, but Do not screw, screwdriver and other sharp objects characterized. Product storage transportation, please handle with care, do not crash, to prevent breakage

4. 金屬氧化膜電阻器使用於滿載額定值時，表面產生高溫約 150°C-250°C，請勿以手處觸摸，為維持電阻器能夠長期使用，請保持電阻器的表面溫度上升在 150°C 以下。

Metal oxide film resistors used in the full load rating, the surface temperature of about 150 °C-250 °C, do not touch the hand at in order to maintain the long-term use of resistors, resistor keep the surface temperature rise of 150 ° C or less.

5. 為抑制其溫度之上升，須要相當的容餘量，請勿使用剛好在滿載額定值上。長時間使用時為其安全顧慮、瓦特數須大於額定功率 2 倍以上，並請儘量使用於額定功率的 50% 以下。

To curb the rise in temperature, have a considerable capacity margin, do not use just on the full load rating. Safety concerns when used for a long time, be greater than the rated power in watts more than 2 times, and try to use the power in the freeze-frame of 50% or less.

6. 雖然電阻器塗層部分可在一般溶劑中浸漬 2 至 3 分鐘，但要注意如果在浸漬後馬上觸摸色環，極易使其剝落。使用助焊劑時也同樣要注意此點。另外，如果採用超音波清洗，在下訂單時注明。

Although the resistor-coated part of the solvent in general dipping 2-3 minutes, but be careful if you touch the color in the ring immediately after impregnation, easy to peel. When using flux also should pay attention to this point. In addition, if the use of ultrasonic cleaning please Indicate when placing an order。