

1. 適用範圍 / SCOPE

此份規格書涵蓋 MSTC0201-series 金屬箔電流感測電阻元件相關規格.

This specification covers MSTC0201-series devices, which are Metal Foil Current Sensing Resistor.

2. 產品型號/TYPE NUMBER

MSTC	0201	M	W25	RXXX	F
(1)	(2)	(3)	(4)	(5)	(5)

- (1) 產品系列號 / SERIES NUMBER : Ex.MSTC0201 = 短電極/ Short electrode ; 兩端子 / two terminal ; 無側導 / without side electrode / size “0.02x0.01”
- (2) 產品材質 / Material : M = 錳銅合金 / MnCu alloy
- (3) 產品瓦特數 / Power Rating : Ex. W25=0.25 Watt
- (4) 產品阻值 / Nominal Resistance Value : Ex. 20mΩ → R020
- (5) 元件電阻偏差值 / Resistance Tolerance : Ex. F=±1%

3. 產品尺寸 / PRODUCT DIMENSIONS

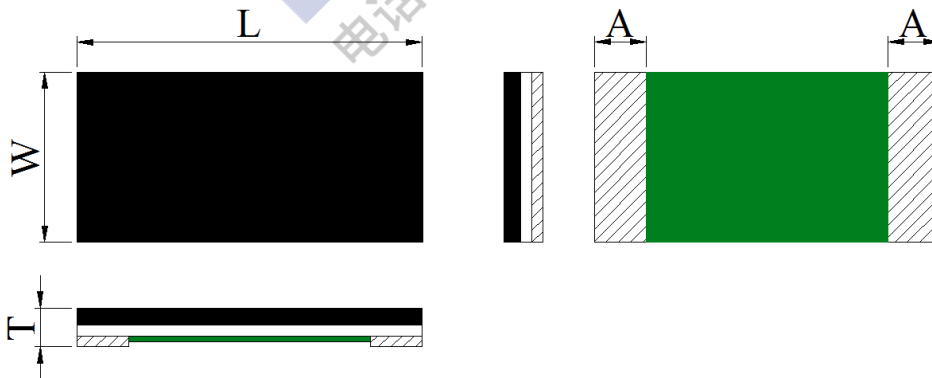


圖 1 / Fig.1

Unit(mm)

Part Number	W	L	T	A
MSTC0201MW25-series R010、R020	0.30±0.10	0.60±0.10	0.25 +0.10/-0.05	0.15±0.10

4. 產品結構及使用材料說明(參考圖 2) / STRUCTURE & MATERIAL (Ref to Fig.2)

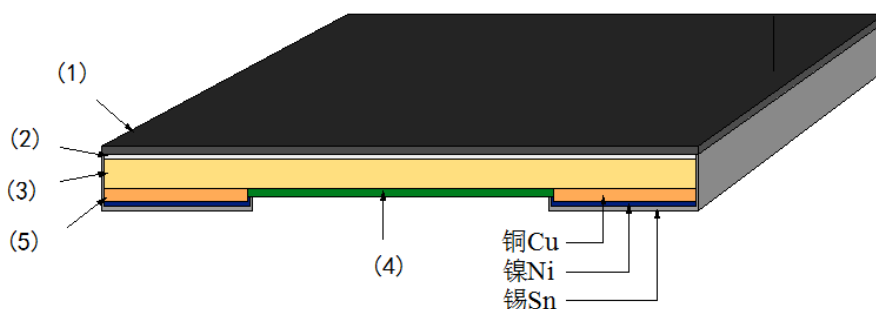


圖 2 / Fig.2

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 保護防焊層 / Protective coating(4) : 防火級環氧樹脂,符合 UL- 94-V0 要求(綠色) /
Flame-retardant epoxy, meets UL- 94-V0 requirements(green)

4.5 端電極 / Terminal electrode(5) : 錫、鎳、銅 / Sn、 Ni、 Cu

5. 電氣特性 / ELECTRICAL CHARACTERISTICS

Part Number	Resistance Value (mΩ)	Power Rating (Watt)	Resistance Tolerance (%)	TCR (ppm/°C)
MSTC0201MW25R010F	10	0.25	±1%(F)	±200
MSTC0201MW25R020F	20	0.25	±0.5%(D)/±1%(F)	±100

6. 產品特性及信賴性測試規範 / 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	$T = +125 \pm 2^\circ\text{C}$; $t = 1000\text{h}$	$\pm(1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.25
溫濕度測試 / Temperature Humidity	$T = 40 \pm 2^\circ\text{C}$; $\text{RH} = 90\%$; $t = 1000\text{h}$	$\pm(1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.25
冷熱衝擊測試 / Thermal Shock	$[-55^\circ\text{C} 30\text{min.} \rightarrow \text{R.T. } 1\text{min.} \rightarrow +155^\circ\text{C} 30\text{min.}$ $\rightarrow \text{R.T. } 1\text{min.}]$, 1000 個連續循環 / 1000Cycles	$\pm(1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.19
在 70°C 下負載壽命測試 / Load Life at 70°C	$V_{\text{test}} = V_{\text{max}}$; $T = 70 \pm 2^\circ\text{C}$; $t = 90\text{min ON}$, 30min OFF, 1000h	$\pm(1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.25

可焊性測試 / Solderability	浸入錫爐 / Dip into solder at $T = 245 \pm 5^\circ\text{C}$, $t = 3 \pm 1 \text{sec.}$	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.	$\pm(1.0\%+0.5\text{m}\Omega)$ JEDEC J-STD-020
端子強度測試 / Terminal Strength	$F=3.4\text{N}$, $t=60 \pm 1 \text{sec.}$	$\pm(1.0\%+0.5\text{m}\Omega)$
蒸煮測試 / Highly Accelerated Stress Test	$T=121 \pm 2^\circ\text{C}$, $p=30\text{PSIA}$, $t=48\text{h.}$	$\pm(1.0\%+0.5\text{m}\Omega)$
震動測試 / Vibration	$f=10\sim 2,000\text{Hz}$, $a=15\text{G} \pm 1.5\text{G}$, $t=20\text{min}$, 12Cycles.	$\pm(1.0\%+0.5\text{m}\Omega)$
機械衝擊測試 / Mechanical Shock	$F=50 \pm 5\text{G}$, $t=11 \pm 1 \text{msec.}$	$\pm(1.0\%+0.5\text{m}\Omega)$ 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 ; 持續時間 / Duration: 10sec.	$\pm(1.0\%+0.5\text{m}\Omega)$ IEC60115-1 4.33

7. 環境特性 / ENVIRONMENTAL CHARACTERISTIC

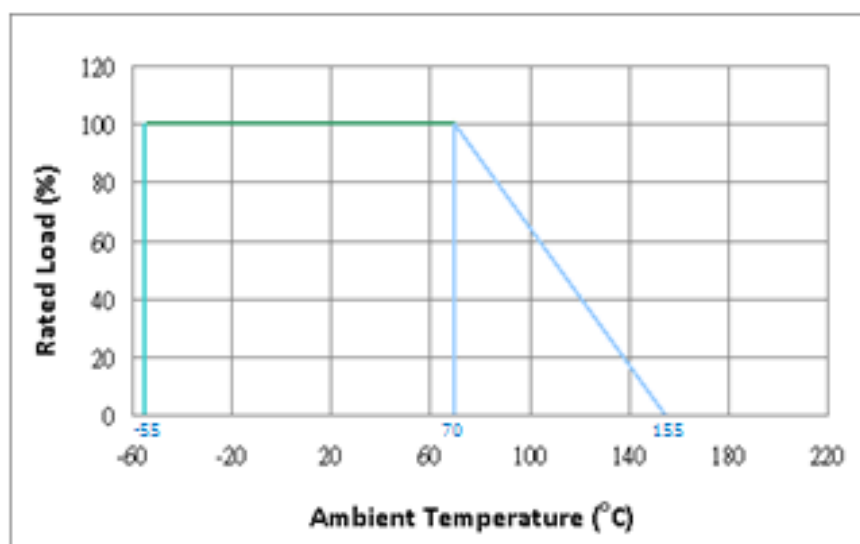
7.1 操作溫度範圍: $-55^\circ\text{C} \sim 155^\circ\text{C}$ / Operating Temperature: $-55^\circ\text{C} \sim 155^\circ\text{C}$

額定功率溫度衰變曲線 / Typical Thermal Derating Curve

額定功率乃指於 70°C 以內可連續滿額功率使用的術語。

下圖為當操作溫度高於 70°C 時的可使用功率衰減曲線。

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 存儲條件 / STORAGE CONDITIONS

在溫度 $+10^\circ\text{C} \sim 40^\circ\text{C}$ 、相對濕度 $\leq 75\%$ 的密閉條件下可存放2年。 /

Under airtight in temperature $+10^\circ\text{C} \sim 40^\circ\text{C}$ 、relative humidity $\leq 75\%$ can store 2 years.

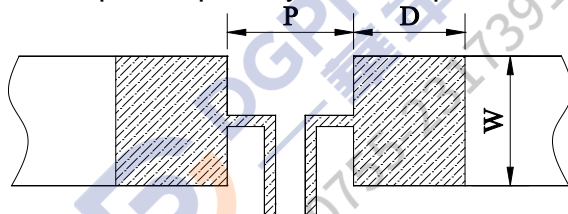
在溫度+10°C~60°C、相對濕度為95%的非露天下最多可存放30天。 /
Without dew in temperature+10°C~60°C、relative humidity be 95% maximum value for 30days.

8. 焊錫墊尺寸及焊接條件 / SOLDER PAD SIZE AND WELDING CONDITIONS

8.1 建議如下圖焊接方式焊接，並滿足所要求的尺寸。 / Propose that the following picture installation way is installed, and satisfied the required size.

Part Number	P	W	D	Loading
MSTC0201MW25-series R010、R020	0.25mm	0.33mm	0.20mm	0.25w

loading : 適用於本司建議焊墊設計並使用於限定穩定電流下 /
suit for specific pad layout and specific steady current



8.2 建議客戶焊接參數 / Recommended Customer Soldering Parameters

8.2.1 回流焊溫度曲線 / Solder reflow Temperature condition (圖 3 / Fig.3)

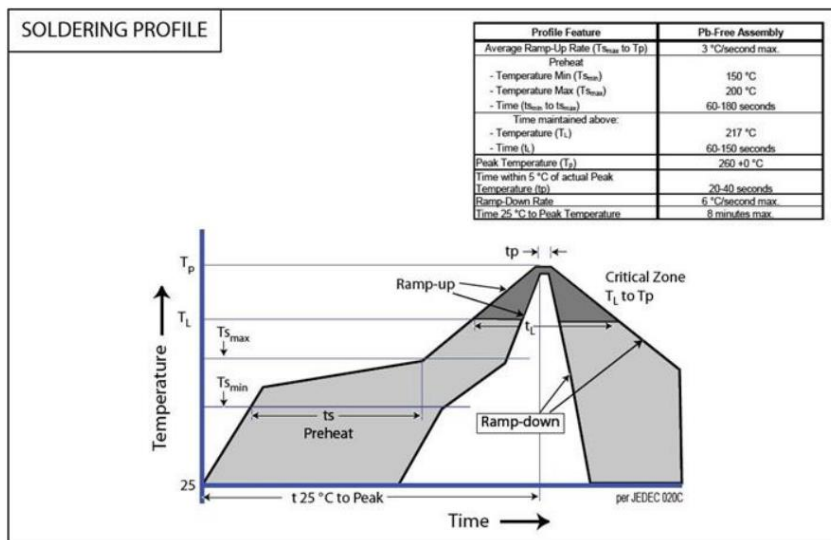


圖 3 / Fig.3

8.2.2 允許烙鐵焊接條件(熱風設備) / Rework temperature (hot air equipment) : 350°C, 3~5seconds

8.2.3 焊接方法建議 / Recommended reflow methods

焊接熱源方式可用紅外線, 熱蒸氣, 熱風. / IR, vapor phase oven, hot air oven

如果焊錫溫度超過允許最高溫度, 則產品本身會有功能損壞的疑慮. / If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

9. 批量生產後出貨測試項目 / Lot ACCEPTANCE TEST REQUIREMENTS

每一批生產均須作入庫檢驗, 每一批生產單量不可超過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 外觀 / Visual

方法 / Procedure : 利用放大鏡進行檢查 / Visual

標準 / Acceptance Criteria : 不能有髒污、不潔、文印錯誤、破損等 / No parts are outstandingly stained

9.2 尺寸 / Dimensions

方法 / Procedure : 使用合適且經校正的尺規 / As appropriate, calipers, micrometers, optical comparator, or approved gages

標準 / Acceptance Criteria : 尺寸均在規定標準範圍內 / No parts outside specific dimensions

9-3 單體元件電阻(Ro) / Resistance (Ro)

方法 / Procedure : 在 25°C 下利用四線量測技術量測之 / Resistance shall be measured with 25 °C in the 4-wire resistance test

標準 / Acceptance Criteria : 電阻值均在規定標準範圍內 / The resistance of the test device shall be within the limits specified

9.4 電阻溫度係數 / TCR

方法 / Procedure : 利用四線法量測出元件分別在 25°C 及125°C 下的電阻值, 並將其帶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

標準 / Acceptance Criteria : 溫度係數值均在規定標準範圍內 / All parts must within the specific $TCR = (R_b - R_a) / R_a \times 1 / (T_b - T_a) \times 10^6$

9.5 絕緣電阻 / Insulation resistance (Ri)

方法 / Procedure : 利用絕緣測試儀量測 / Resistance between protective layer and resistive shall be measured by high ohm meter

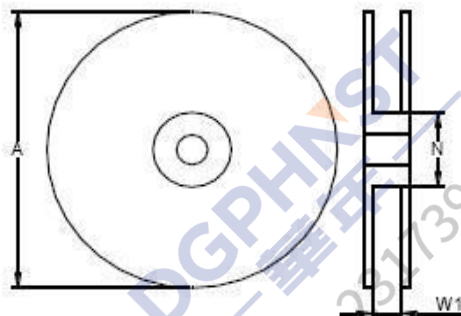
標準 / Acceptance Criteria : 防焊層與電阻本體絕緣電阻至少高於100MΩ / The resistance of the test device shall over 100MΩ

10. 包裝訊息 / PACKAGING INFORMATION

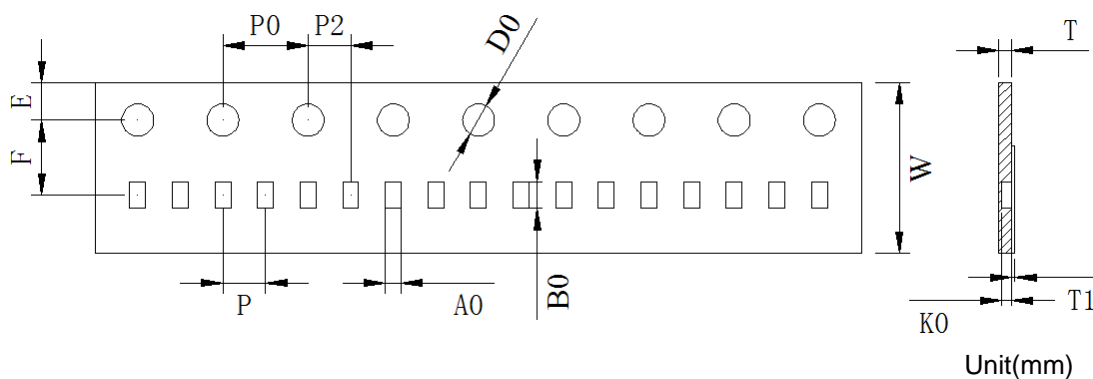
10.1 包裝數量、重量 / QUANTITY & WEIGHT

型號 / Type Number	數量 / Quantity (pcs)	重量 / Weight (g)
MSTC0201-series	10,000	100±30

10.2 捲輪規格 / Reel & Tape specifications



型號 / Type Number	A±5 (mm)	N±2 (mm)	W1±1 (mm)
MSTC0201-series	178	60	9.0

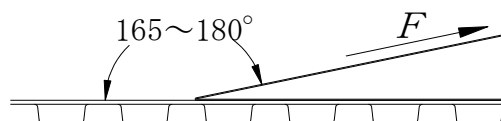


MSTC0201-series							
W	8.00 ± 0.20	P0	4.00 ± 0.10	P	2.00 ± 0.10	P2	2.00 ± 0.10
A0	0.38 ± 0.10	B0	0.68 ± 0.10	D0	1.50 ± 0.10	F	3.50 ± 0.10
E	1.75 ± 0.10	T	0.45 ± 0.05	T1	Max. 0.1	K0	0.30 ± 0.05

10.3 密封膠膜剝離強度要求 / Peeling Strength of Seal Tape

F = 剝離強度 : 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規格書的要求，必須經由雙方協商確認。 / In the event that an impropriety is found beyond this specification ,it shall be fixed by mutual agreement between the parties.
- 11.2 如果本規格書有不適當的情況，必須通過雙方協商並由本公司修改。 / 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.

