


**1. 適用範圍 / SCOPE**

此份規格書僅涵蓋1206F系列產品.

This specification covers 1206F series devices, which is SMD Fuse.

**2. 產品名稱及編碼 / TYPE NUMBER & PART NUMBER**
**2-1 產品名稱/ TYPE NUMBER**

|       |       |      |   |
|-------|-------|------|---|
| 1206F | ****A | ***V |  |
| (1)   | (2)   | (3)  | (4)   |



( 1 ) 系列號: 1206F (尺寸: 0.12×0.06; 熔斷特性:快斷 )

Series Number: 1206F (Size: 0.12×0.06; Melting characteristic: Fast Acting)

( 2 ) 額定電流: (例如:3.5A=3.5 安培)

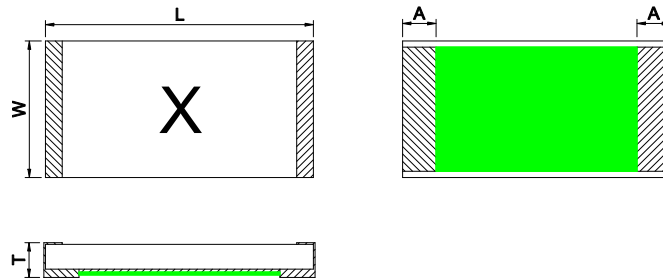
Rating Current : (Ex. :3.5A = 3.5 Ampere)

( 3 ) 額定電壓: (例如:63V=63 伏特 )

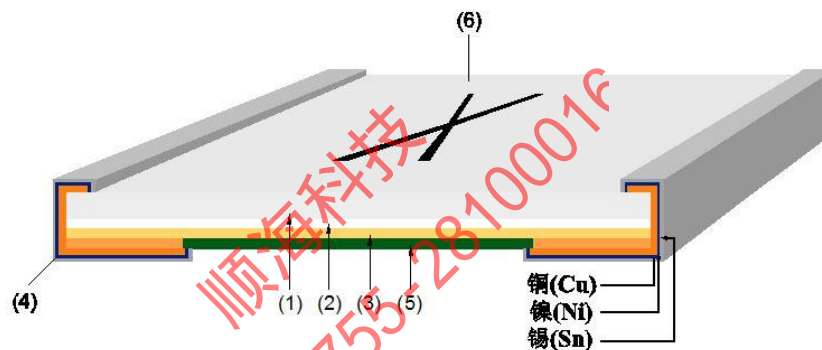
Rating Voltage : (Ex. :63V = 63 Volt)

( 4 ) 安規認證 / Safety Approval

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**3. 產品尺寸和結構 / SIZE AND STRUCTURE**
**3-1 尺寸 (單位: mm) / SIZE (Unit: mm)**



| 型號 / Type number | W         | L         | T         | A         |
|------------------|-----------|-----------|-----------|-----------|
| 1206F****A***V   | 1.60±0.25 | 3.20±0.25 | 0.60±0.15 | 0.58±0.20 |

**3-2 產品結構及使用材料說明 / STRUCTURE & MATERIAL**


| 編號<br>No. | 元件<br>Component             | 材質<br>Material                   | 數量<br>Quantity |
|-----------|-----------------------------|----------------------------------|----------------|
| (1)       | 基板<br>Substrate             | 氧化鋁陶瓷<br>Alumina Ceramic         | 1              |
| (2)       | 粘著層<br>Adhesion layer       | 環氧樹脂<br>Epoxy                    | 1              |
| (3)       | 熔絲本體<br>Fuse element        | 銅合金/錫<br>Cu Alloy / Sn           | 1              |
| (4)       | 端電極<br>Terminal electrode   | 銅/鎳/錫<br>Cu / Ni / Sn            | 2              |
| (5)       | 保護防焊層<br>Protective coating | 防火級環氧樹脂<br>Flame-retardant epoxy | 1              |
| (6)       | 文印防焊層<br>Marking coating    | 防火級環氧樹脂<br>Flame-retardant epoxy | 1              |

### 4. 基本資訊/ ORDERING INFORMATION

● approved ○ pending

| 型號<br>Type Number | 標示<br>Marking | 額定電流<br>Rated Current | 額定電壓<br>Rated Voltage | 阻值<br>Nominal Resistance | I <sup>2</sup> t<br>Nominal Melting I <sup>2</sup> t | 安規認證<br>Safety Approval   |
|-------------------|---------------|-----------------------|-----------------------|--------------------------|--|---|
|                   |               | (ADC)                 | (VDC)                 | (Ω)                      | (A <sup>2</sup> s)                                   |  |
| 1206F 1A 63V      | P             | 1.0                   | 63                    | 0.2450                   | 0.138  | ●   |
| 1206F 1.25A 63V   | Q             | 1.25                  | 63                    | 0.1500                   | 0.216  | ●   |
| 1206F 1.5A 63V    | Q1            | 1.5                   | 63                    | 0.1400                   | 0.311  | ●   |
| 1206F 1.75A 63V   | R1            | 1.75                  | 63                    | 0.1300                   | 0.424  | ●   |
| 1206F 2A 63V      | S             | 2.0                   | 63                    | 0.0530                   | 0.553  | ●   |
| 1206F 2.5A 63V    | T             | 2.5                   | 63                    | 0.0370                   | 0.865  | ●   |
| 1206F 3A 63V      | T1            | 3.0                   | 63                    | 0.0275                   | 1.245  | ●   |
| 1206F 3.5A 63V    | U1            | 3.5                   | 63                    | 0.0190                   | 1.695  | ●   |
| 1206F 4A 63V      | V             | 4.0                   | 63                    | 0.0180                   | 2.214  | ●   |
| 1206F 5A 63V      | W             | 5.0                   | 63                    | 0.0150                   | 3.459  | ●   |
| 1206F 6A 63V      | W1            | 6.0                   | 63                    | 0.0120                   | 4.981  | ●   |
| 1206F 7A 63V      | X1            | 7.0                   | 63                    | 0.0100                   | 6.780  | ●   |
| 1206F 8A 63V      | Y             | 8.0                   | 63                    | 0.0080                   | 8.856  | ●   |
| 1206F 10A 63V     | Z             | 10.0                  | 63                    | 0.0070                   | 13.837   | ●   |

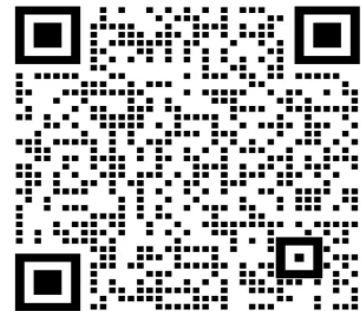
說明/Notes :

a. “一般電阻值”是在通以小於額定電流的 10%的弱電流條件下量測的阻抗.

Nominal Resistance measured with <10% rated current ;

b. “一般 I<sup>2</sup>t ”是指自通電至作動時間為 10ms 的過程所對應的 I<sup>2</sup>t.

Nominal Melting I<sup>2</sup>t measured at 10 m sec opening time ;

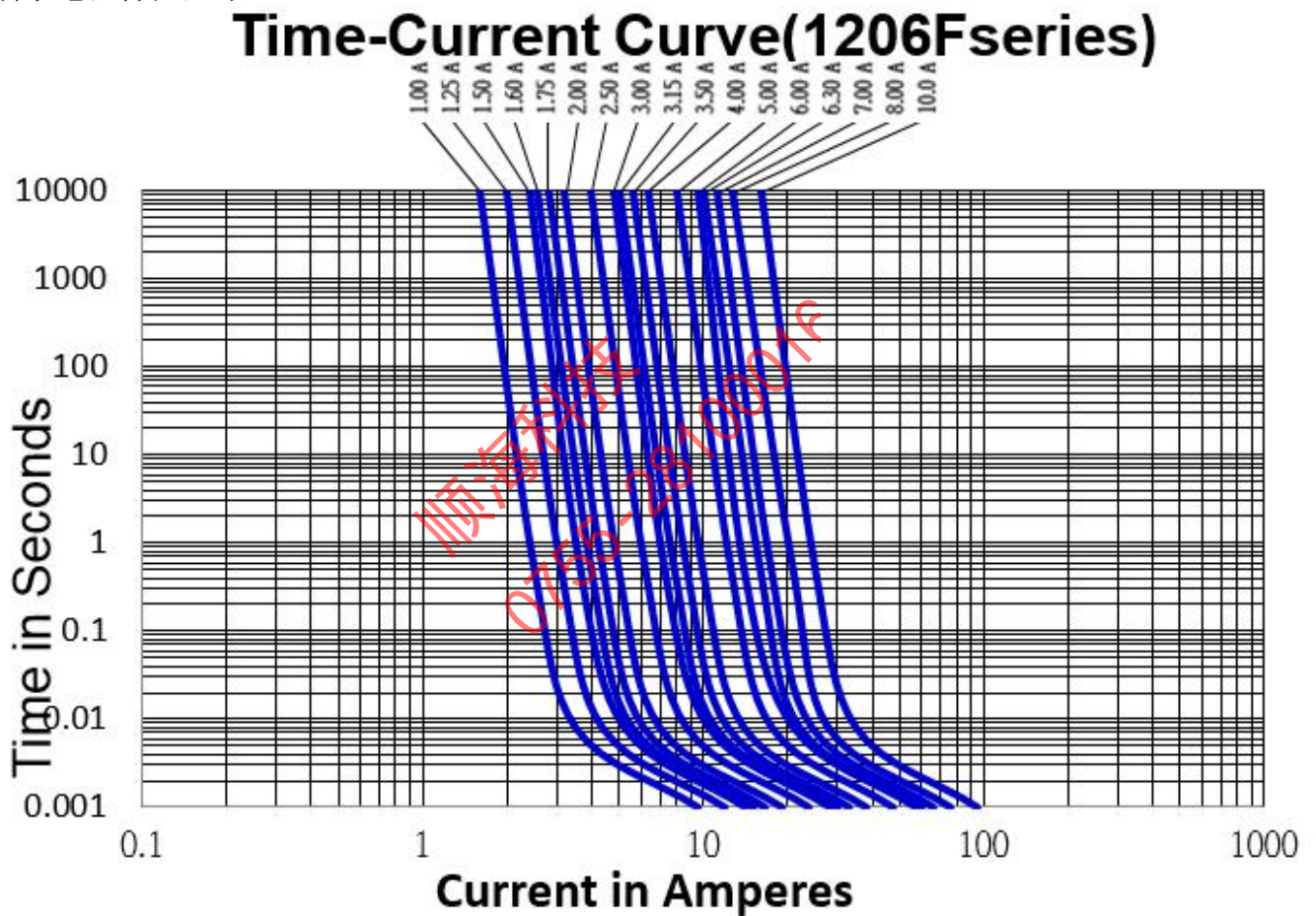


**5. 電氣特性 / ELECTRICAL CHARACTERISTICS**
**5-1 時間-電流特性/ Pre-Arcing Time-Current Characteristics (limits)**

| 額定電流<br>RATED CURRENT | 1.0I <sub>n</sub> | 2.5I <sub>n</sub> | 3.5I <sub>n</sub> |
|-----------------------|-------------------|-------------------|-------------------|
| 0.5A to 10A           | 4hrs min.         | 5sec max.         | 1sec max.         |

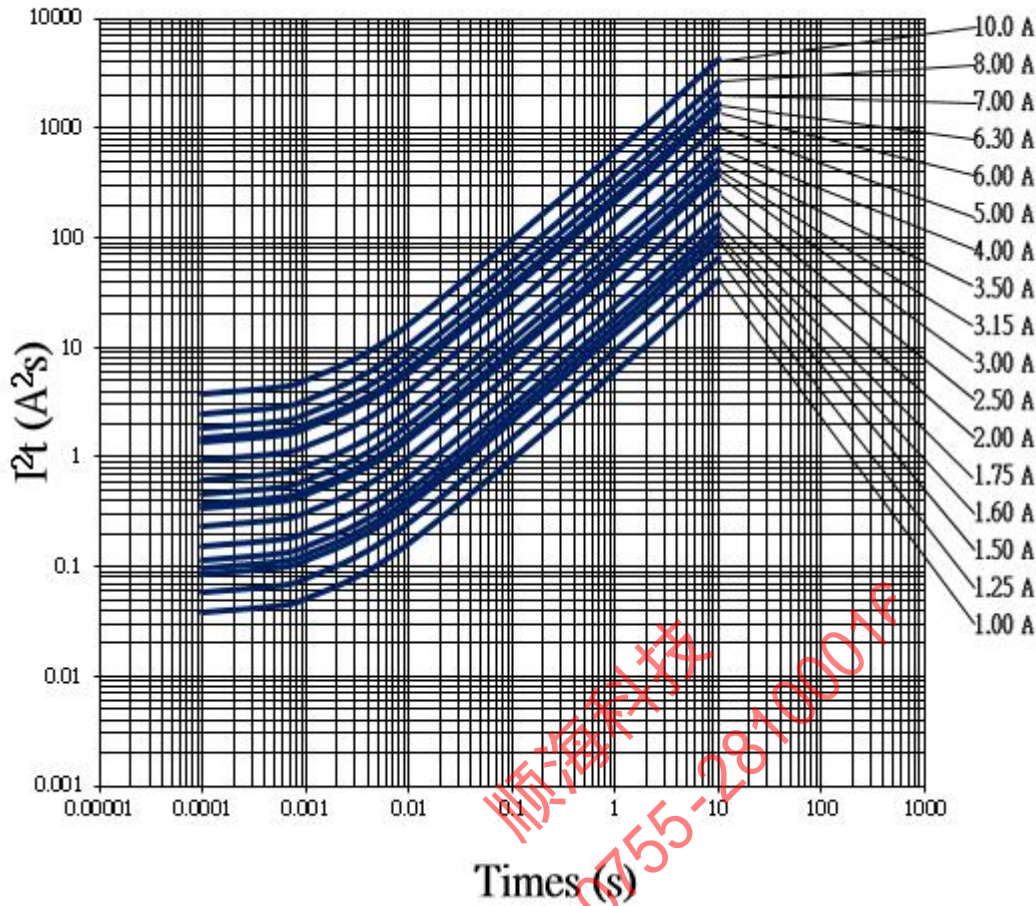
I<sub>n</sub> : 25°C 下額定電流 / Rating Current at 25°C

時間-電流特性曲線 / Time-Current Curve:



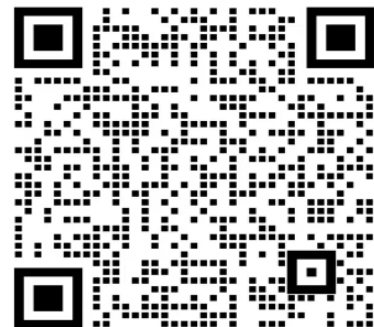
5-2  $I^2t$ -t 曲線 /  $I^2t$ -t Curve:

$I^2t$  vs. t Curves(1206F series)



5-3 分斷能力 / Breaking Capacity

| 額定電流<br>RATED CURRENT | 分斷能力<br>BREAKING CAPACITY |
|-----------------------|---------------------------|
| 1A~10A                | V =63V DC ; I=50A         |





**6. 產品特性及信賴性測試規範/PRODUCT CHARACTERISTICS AND RELIABILITY TEST STANDARD**

| 序號<br>No. | 項目<br>Item                              | 內容<br>Content   | 判定標準<br>Criteria   |
|-----------|---|---|--|
| 1         | 時間/電流特性<br>Time/current characteristics | 分別通以1.0In、2.5In、3.5In電流，<br>得出相對應的時間<br>I=1.0In、2.5In、3.5In and measure<br>the value of time individually by<br>meter ,       | 各電流條件下的時間參數符合規定值<br>Value of time measured in different<br>currents is within spec. UL248-1/-14  |
| 2         | 分斷能力測試<br>Breaking capacity             | V = 63V DC /125V DC ; I=50A   | 沒有持續電弧、燃燒、爆炸現象<br>No a permanent arcing, ignition, bursting<br>UL248-1/-14   |
| 3         | 可焊性<br>Solder ability                   | 熔錫溫度245°C±5°C，浸錫時間<br>5s±0.5s，浸入深度從基座面起<br>2.0mm±0.5mm，放在20X的放大鏡下<br>檢查T=245°C±5°C，t=5s±0.5s，<br>magnifier : 20X              | 錫覆蓋率≥95%<br>Cover ≥95%<br>MIL-STD-202 Method 208   |
| 4         | 抗焊性測試<br>Soldering heat resistance      | 熔錫溫度/ T =250°C±5°C，浸錫時間<br>/ t =30±5s T=250±5°C, t=30±5s  | 外觀無裂紋和損傷，前後阻值偏差小於或<br>等於±15%；文印清晰可辨<br>No crack and damage, ΔR<15%<br>Marking is easily legible<br>MIL-STD-202, Method 210F, Condition K |
| 5         | 冷熱衝擊<br>Thermal Shock                   | -65°C,放置時間為15min,→<br>25°C, ,放置時間為5min→<br>125°C放置時間15min<br>循環次數為100個<br>-65°C 15min~25°C 5min~ +125°C<br>15min ; 100 cycles | 外觀無裂紋和損傷，前後阻值偏差<±10%<br>No crack and damage, ΔR<10%<br>MIL-STD-202, Method 107G conditionB-3   |
| 6         | 機械衝擊<br>Mechanical Shock                | 峰值100 G,持續時間11ms,波形:<br>半正弦，五次脈衝<br>a=100G for 11ms, 5pulses  | 外觀無裂紋和損傷，前後阻值偏差<±<br>10%。<br>No crack and damage, ΔR<10%<br>MIL-STD-202, Method 213B   |
| 7         | 振動測試<br>Vibration                       | 承受振幅為0.03 英寸(全程最大0.06<br>英寸),頻率在大約10Hz到55Hz 的範<br>圍均勻地變化的簡諧運動.)   | MIL-STD-202, Method 201A   |
| 8         | 高頻振動測試<br>Vibration, High Frequency     | 20g's峰值，公差值為±10%，振動<br>頻率10Hz-2000Hz，總計時間為<br>12h   | MIL-STD-202, Method 204D, Condition D  |

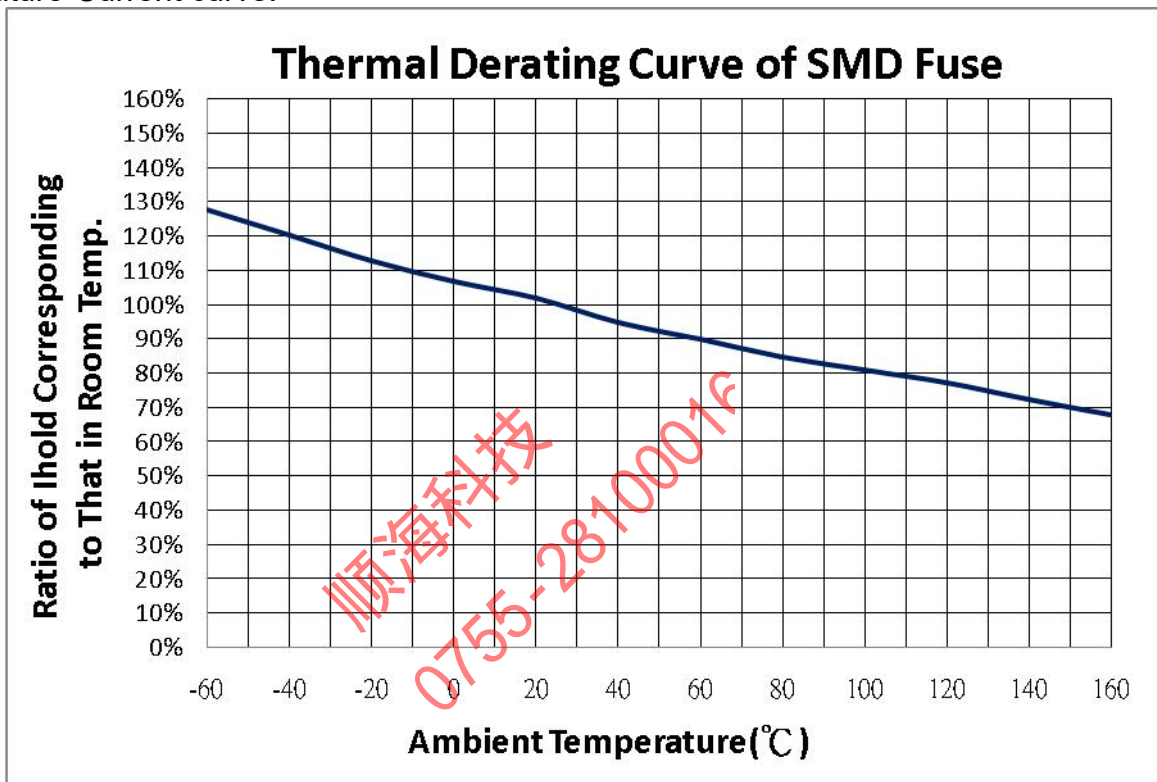
## 7. 環境特性 / ENVIRONMENTAL CHARACTERISTIC

### 7-1 操作溫度範圍: $-55^{\circ}\text{C} \sim 150^{\circ}\text{C}$ / Operating Temperature: $-55^{\circ}\text{C} \sim 150^{\circ}\text{C}$

若貴司操作環境溫度超出 $25 \pm 5^{\circ}\text{C}$ 範圍，在選用保險絲規格時，需考慮操作環境溫度對保險絲的影響。請參照：溫度-電流曲線圖。

When choosing the fuse's specification, if the operating environmental temperature beyond the scope from  $20 \sim 30^{\circ}\text{C}$ , you should consider the environmental temperature's affection to fuses. please refer:

Temperature-Current 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 $10^{\circ}\text{C} \sim 40^{\circ}\text{C}$ 、相對濕度為95%的非露天下最多可存放30天。

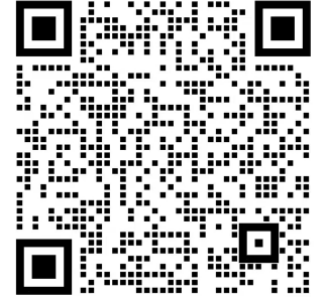
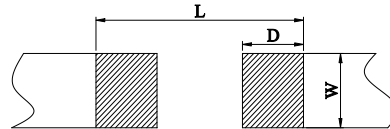
Without dew in temperature  $10^{\circ}\text{C} \sim 40^{\circ}\text{C}$ 、relative humidity be 95% maximum value for 30days.

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

8-1 焊墊尺寸建議 / Recommended Size of the Pad.

| L      | W      | D      | t                    |
|--------|--------|--------|----------------------|
| 4.05mm | 2.40mm | 1.25mm | $\geq 35\mu\text{m}$ |

t : 元件焊墊金屬層厚度 (min.) / t : Thickness of pad metal (min.)



8-2 焊接參數建議 / Recommended Customer Soldering Parameters

溫度曲線 Temperature Condition

預熱段 :  $145 \pm 15^\circ\text{C}$ , max. 120 sec.

Preheating :  $145 \pm 15^\circ\text{C}$ , max. 120 sec.

焊錫段 : min.  $220^\circ\text{C}$ , max. 60 sec.

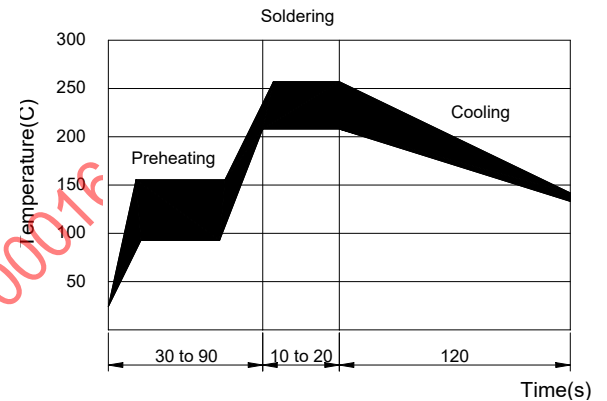
Soldering: min.  $220^\circ\text{C}$ , max. 60 sec.

允許最高溫度 :  $260 \pm 5^\circ\text{C}$ , max. 10sec.

Maximum temperature :  $260 \pm 5^\circ\text{C}$ , max. 10sec.

允許烙鐵焊接條件(熱風設備):  $350^\circ\text{C}$ , 3~5seconds

Rework Temperature (hot air equipment) :  $350^\circ\text{C}$ , 3~5seconds



8-3 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. 批量生產出貨測試項目 / LOT ACCEPTANCE TEST REQUIREMENTS****9-1 外觀 / Visual**

方法：利用放大鏡進行檢查

Procedure: Visual

標準：不能有髒汙、不潔、文印錯誤、破損等

Acceptance Criteria: No parts are outstandingly stained.

**9-2 尺寸 / Dimensions**

方法：使用合適且經校正的尺規

Procedure: As appropriate, calipers, micrometers, optical comparator, or approved gages.

標準：尺寸均在規定標準範圍內

Acceptance Criteria: No parts outside specific dimensions.

**9-3 時間-電流特性 / Time-Current Characteristics**

方法：測試電流 $I=1.0I_n$  ;  $2.5I_n$  ;  $3.5I_n$ ,量測出個別電流下的對應時間

Procedure :  $I=1.0I_n$  ;  $2.5I_n$ ;  $3.5I_n$  and measure the value of time individually by meter at  $25^{\circ}\text{C}$

標準：對應時間值均在規定標準範圍內

Acceptance Criteria: All parts must within the specific .

**9-4 分斷能力 / Breaking Capacity**

方法：測試電壓\電流為 $V = 125\text{V}/\text{DC} / 63\text{V}/\text{DC}$  ;  $I=50\text{A}$ , 利用此條件衝擊元件

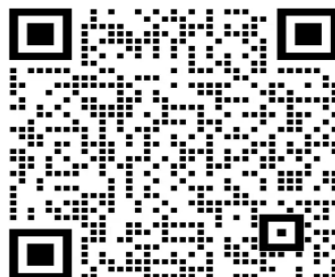
Procedure:  $V = 125\text{VDC}/63\text{VDC}$  ;  $I=50\text{A}$

標準：元件不發生持續電弧燃燒及爆裂

Acceptance Criteria: No permanent arcing, ignition, bursting

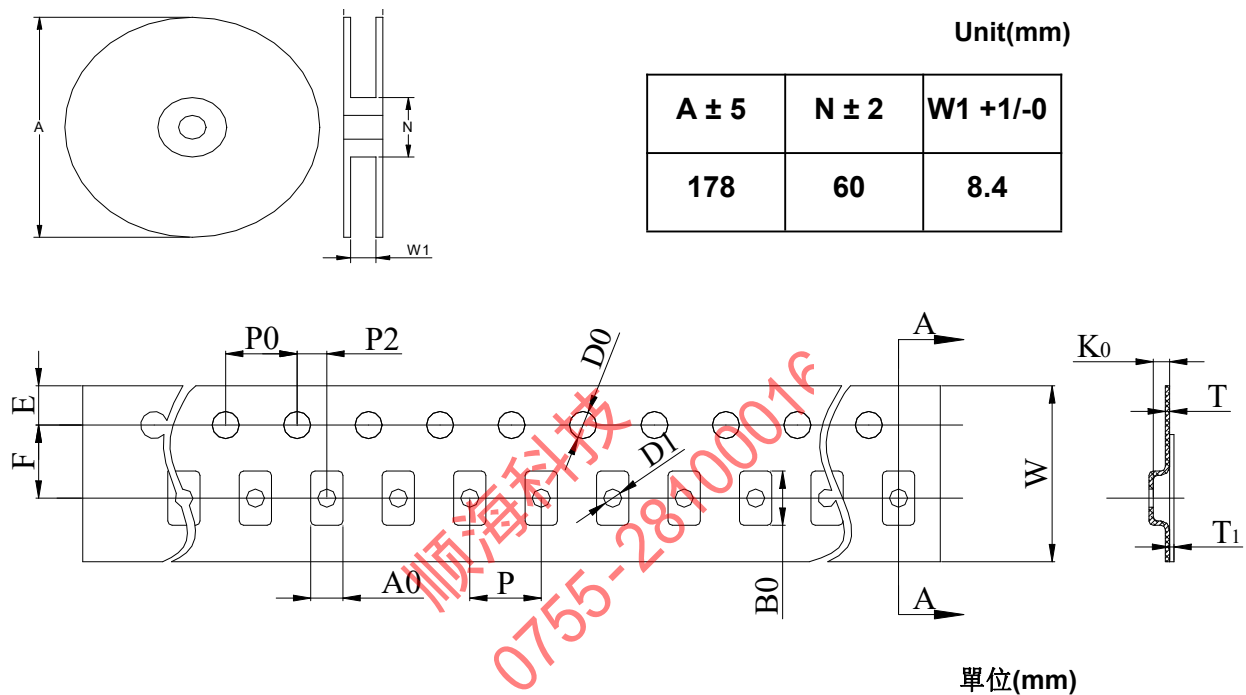
**10. 安全認證及編號 / STANDARDS AND APPROVALS**

|    |        |
|----|--------|
| UL | E56092 |
|----|--------|



**11. 包裝訊息 / PACKING INFORMATION**
**11-1 包裝數量、重量 / QUANTITY & WEIGHT**

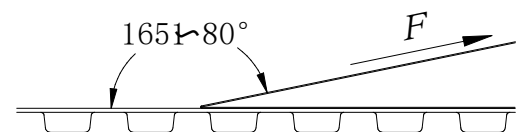
| 編碼 Part Number        | 數量 (pcs) Quantity(pcs) | 重量(g) Weight(g) |
|-----------------------|------------------------|-----------------|
| <b>1206F****A***V</b> | <b>5,000</b>           | <b>140±20</b>   |

**11-2 捲輪規格 / Reel & Tape specifications**


|           |                    |           |                    |
|-----------|--------------------|-----------|--------------------|
| <b>W</b>  | <b>8.00±0.10</b>   | <b>E</b>  | <b>1.75 ± 0.10</b> |
| <b>P0</b> | <b>4.00 ± 0.10</b> | <b>T</b>  | <b>0.20±0.05</b>   |
| <b>P</b>  | <b>4.00 ± 0.10</b> | <b>T1</b> | <b>Max. 0.1</b>    |
| <b>P2</b> | <b>2.00 ± 0.10</b> | <b>A0</b> | <b>2.05±0.10</b>   |
| <b>D0</b> | <b>1.50 ± 0.10</b> | <b>B0</b> | <b>3.65±0.10</b>   |
| <b>D1</b> | <b>1.00 ± 0.10</b> | <b>K0</b> | <b>0.85±0.10</b>   |
| <b>F</b>  | <b>3.50±0.10</b>   |           |                    |

**11-3 密封膠膜剝離強度要求 / Peeling Strength of Seal Tape**

F = 剝離強度 : 0.3 – 1.0N ( 30 - 100gf )  
 F = Peeling Strength: 0.3 – 1.0N (30 - 100gf)



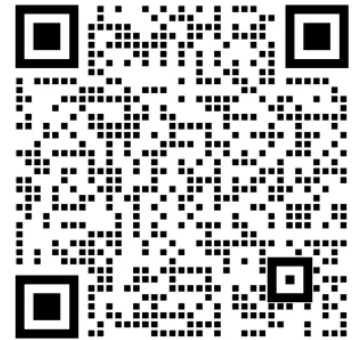
**12. 其他 / OTHERS**

12-1 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.

12-2 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 , Walter Electronic Technology Co., Ltd. shall amend it by mutual agreement between the parties.



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| 版次    | 製作                | 確認                | 審核               |
|-------|-------------------|-------------------|------------------|
| 第1.8版 | 蔡小梅<br>2021/12/21 | 陈鹏安<br>2021/12/21 | 陈荣<br>2021/12/21 |



# UL iQ for Fuses



## Fuses

E56092

### Guide Information

## SUZHOU WALTER ELECTRONIC CO LTD

Fenhu Technic Development Zone, Wujiang Jiangsu 215211 CN

### F93, 1206F

Supplemental micro fuses

| <u>Size</u><br><u>mm(in)</u>         | <u>Amps</u><br><u>(A)</u> | <u>Volts</u><br><u>(V)</u> | <u>Interrupting</u><br><u>Rating (A)</u> |
|--------------------------------------|---------------------------|----------------------------|--|
| 3.2 x 1.6 x 0.6 (0.13 x 0.06 x 0.02) | 0.5 - 0.8                 | 125Vdc                     | 50                                       |
|                                      | 1 - 10                    | 63Vdc                      | 50                                       |
|                                      | 1 - 10                    | 24Vdc                      | 50                                       |
|                                      | 1 - 10                    | 32Vdc                      | 50                                       |
|                                      | 0.5 - 0.8                 | 24Vdc                      | 50                                       |
|                                      | 0.5 - 0.8                 | 32Vdc                      | 50                                       |
|                                      | 0.5 - 0.8                 | 63Vdc                      | 50                                       |

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Last Revised: 2018-09-04

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