



功得電子工業股份有限公司
CONQUER ELECTRONICS CO.,LTD.

規格書

Specification For Approval

Spec. No. SFA052

品名：PTU 系列 慢速型瓷管保險絲

Type：PTU *Time-Lag*

Ceramic Tube Fuse with Pig-Tail Series

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History of Change

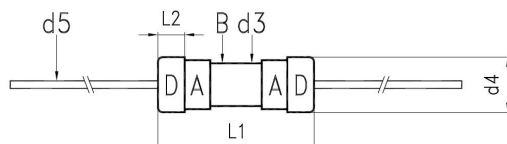
REV.	Description	Date	Drawn	Designed	Checked	Approved
1	(1)發出Issue	2010.07.07	陳志強	蔡進義	蔡進義	蔡其湖
2	(1)拉力1.4kg 修正為1.2kg	2010.09.05	陳志強	蔡進義	蔡進義	蔡其湖
3	(1)更新冷阻值	2011.06.18	陳志強	蔡進義	蔡進義	蔡其湖
4	(1)修正冷阻值	2012.02.07	陳志強	蔡進義	蔡進義	蔡其湖
5	(1)新增14.建議生產參數(無鉛焊錫使用)	2012.12.24	陳志強	蔡進義	蔡進義	蔡其湖
6	(1)修改內文項次6 ; Suger Test→Pulse Test (2)新增內文項次12 : 新增I2T (3)新增內文項次16 : 新增IT曲線圖 (4)新增內文項次17 : 新增I2T曲線圖 (5)新增內文項次18 : 信賴性規範	2014.08.29	彭市正	邱俊傑	蔡進義	蔡其湖
7	(1)新增材料尺寸L2	2014.10.14	彭市正	邱俊傑	蔡進義	蔡其湖
8	(1)修改內文項次10: 1000PCS/盒→500PCS/盒 (2)修改內文項次12 : 修改I2T	2015.12.08	熊宏偉	邱俊傑	蔡進義	蔡其湖

～ 筒管狀保險絲 ～

Fuses for Instrument, Power and Telephone (Non-indicating)

- 1 **適用範圍**: 本標準適用於保護儀器、電源供應器和電話機用之筒管式熔斷保險絲。
Available Range: For protecting instruments, power supplies and telephone sets.

- 2 **形狀及尺寸如下圖** 單位: mm
Shape & Size as following illustrations.



PTU Series

- 2.1 構造形狀 Structure & Shape : 如上圖 As shown in figure above

- 2.2 額定電壓 Rated Voltage: 250V AC

- 2.3 額定電流 Rated Current: 250mA~6.3A

※註1 (Note1)

安培數 Ampere Rating	腳徑 Lead Wire
250mA~4A	ϕ 0.6 mm
5A~6.3A	ϕ 0.8 mm

- 3 **材料** Material:

- 3.1 筒管本體: 不透明瓷管不可破裂或變形。

Tube (Body): Non-Transparent ceramic tube fuse. No breaking or deformation is allowed.

- 3.2 兩端銅蓋: 需以導電率良好之黃銅為材料。

Two brass end caps: Made of brass of good conductivity.

- 3.3 銅蓋處理: 銅蓋部份鍍鎳，標示最後若加 "S" 者，表示須鍍銀。

Coating of brass caps: Plating the surface with nickel. If the indication is added with "S", it needs to be plated with silver.

PTU Series

NO.	Part Name 部品名稱	Volume 數量
A	Brass Cap - Nickel Plating 銅帽 - 鍍鎳	2
B	Ceramic Tube - Non-Transparent Ceramic Tube 瓷管 - 不透明瓷管	1
C	Fuse Element 可熔體	1
D	Cap-on Lead-Cap - Tinned Copper Wire and Cap 銅帽附腳 - 銅蓋加鍍錫銅線	2
d3	Dia. of Ceramic - 3.00±0.2 mm 瓷管直徑	
d4	Dia. of Cap - 3.90±0.2 mm 銅帽直徑	
d5	Dia. of Lead Wire - (註1)±0.05mm 附腳直徑 Length of Lead Wire - 30±2mm 長度	
L	Body of Fuse - 10.50±0.75mm 本體尺寸	
L1	Total Length W/Cap-on on Both Ends 11.00±0.75mm	
L2	Height of Cap - 2.00±0.2mm 銅帽高度	



4 電氣特性 Electrical Characteristics:

4.1 負載容量: 通過額定電流值150 % (亦即 $1.5 \times I_n$ A), 能繼續通電至少 1小時無任何熔化現象。

Loading Capacity: Loading 150% Rated Current (i.e. $1.5 \times I_n$ A) for flowing, and it's available to let current keep on flowing at least 1 hour without any melting. (Can keep 1 Hour minimum)

4.2 壓降測量: 以額定電流, 通過保險絲, 其兩端壓降值不得超過最大值, 可參考 IEC60127-3 Sheet 4。

Voltage drop: Loading 100% of rated current.(ie $1.0 \times I_n$), the voltage drops across the fuse-links shall not exceed the maximum values given on the relevant standard sheet (IEC60127-3 Sheet 4)

4.3 過載熔斷: 請參照下表。Melting due to overloading: Details as follows Table.

※最大熔斷時限Operating Characteristics

安培數 Rating	150% Rating		210% Rating		275% Rating		400% Rating		1000% Rating	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
250mA~6.3A	60 min			2 min	400 ms	10 sec	150 ms	3 sec	20 ms	150 ms

5 機械特性 Mechanical Properties:

5.1 拉力強度:當施加軸拉力1.2公斤於兩端附腳(或銅帽), 無鬆動或損壞現象發生。

Terminal Strength:Leads and/or caps are soldered (adhered) to withstand axial pulling force of 1.2kg without loosening or any harmfulness to firmly attachment.

5.2 彎折強度 Bending Strength:

銅帽附腳腳徑1.0mm(含)以下, 經過兩次反向之彎折後(彎折90度再折回原位謂之一次彎折)不發生損壞。

Diameter of lead wire ≤ 1.0 mm: After two bends of opposite directions (bending through an angle of 90° and back is defined as one bend) of lead, no damage is to be visualized.

6 突波實驗 Pulse Test:

為適應電感或電容性電路所產之暫態電流, 本品於10倍額定電流的熔斷時間最少為 20ms。
In order to stand transient current caused by inductive or capacitive, the fuses are designed to have minimum clearing time of 20 millisecond at 1000% rated current.

7 耐久實驗 Endurance(On-Off Test):

7.1 於額定電流 ($1.0 \times I_n$), 1小時ON, 15分鐘OFF, 共100次。

Loading 100% rated current ($1.0 \times I_n$), 1 hour ON, 15 minutes OFF. Keep 100 cycles.

7.2 接著以1.5倍之額定電流($1.5 \times I_n$) 通過1小時。

Followed by 1 Hour at 1.5 times the rated current ($1.5 \times I_n$).

7.3 再以4.2之方式量測壓降值, 所測得之壓降值不可比原值增加10%以上。

The voltage drop across the fuse-link after the test shall not have increased by more than 10% of the original value measured before the test

8 高溫環境試驗 Derating Test:

本品置於 70°C 之高溫中, 能以額定電流 ($1.0 \times I_n$)通過1小時。

In an air circulating oven at 70°C , the fuses can load 100% rated current for 1 hour and they shall not operate.

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9 遮斷能力 Breaking Capacity(Interrupting rating):

35 amperes or $10 \times$ rated current ; whichever is greater at 250V AC.

10 包裝 Packing:

PTU-500 PCS/盒 內盒印明下列標示:料號、額定(電壓、電流、遮斷能力)及安規名稱。

包裝材料均符合RoHS或者HF的環保要求,且包裝材料不會和零件發生化學反應,造成不良。

PTU-500 pcs in an inner box. The following items indicated on the box.

Mark: Catalog number; ratings (voltage, current, interrupting capacity), and safety mark.

The packing material conforms to RoHS or the HF environmental protection request.

And the packing material can't have the chemical reaction with the components.

11 其他 Other:

11.1 除非另有指定,上述機械、電器特性,係於常溫,標準狀況下測試之。

Unless otherwise, specified, all tests to be performed at $25 \pm 5^\circ\text{C}$ and 35-75% RH.

11.2 於標準狀況下儲放一年,本品乃確保上述機械與電氣之特性。

After one year's storage under normal condition, this item is guaranteed to meet the requirements mentioned above.

12 標記/安規認證 Mark/ Safety certification:

PTU Series

Mark Approvals	VDE	UL	SA	CCC	CE	Nominal Resistance Cold Ohms	Nominal Melting I^2t A ² Sec
250 mA	**	**	**	**	*	0.731	0.3262
315 mA	**	**	**	**	*	0.472	0.5255
400 mA	**	**	**	**	*	0.316	0.7296
500 mA	**	**	**	**	*	0.256	1.3100
630 mA	**	**	**	**	*	0.170	2.6179
800 mA	**	**	**	**	*	0.113	4.0645
1 A	**	**	**	**	*	0.086	6.6388
1.25 A	**	**	**	**	*	0.064	14.738
1.6 A	**	**	**	**	*	0.046	29.768
2 A	**	**	**	**	*	0.034	32.976
2.5 A	**	**	**	**	*	0.026	61.200
3.15 A	**	**	**	**	*	0.019	91.197
4 A	**	**	**	**	*	0.014	149.98
5 A	**	**	**	**	*	0.010	188.60
6.3 A	**	**	**	**	*	0.008	276.76

*: 有安規認證 Have safety certify

** : 有安規認證及銅帽上有安規印字標記 Have safety certify and safety mark on the cap

13 系列品名列表 series model list :

品名	安培數
VUC PTU ___A ___V (PF)	250mA~6.3A

例： VUC PTU A 250V (PF)
 1 2 3 4 5

- 1 安規認證 Safety Approval
- 2 系列品名 Series Model : PTU
- 3 安培數 Ampere Rating : 250mA~6.3A
- 4 伏特數 Voltage : 250V
- 5 無鉛標示 Pb Free : (PF)

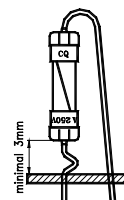
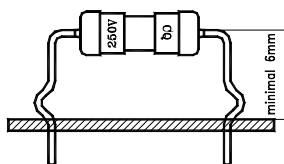
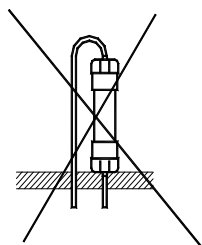
14 建議生產參數(無鉛焊錫使用) :

Recommended Process Parameters(for the action to Lead-free solder alloy) :

14.1 波峰參數 Wave Parameter	預熱溫度 Preheat temperature 最低溫度：100度 Temperature Minimum : 100℃ 最高溫度：150度 Temperature Maximum : 150℃	錫槽溫度 Solder Pot Temperature 260度 Maximum 260℃ Maximum 焊接時間 2~3 seconds Solder Dwell Time: 2~3 seconds
14.2 建議手持烙鐵焊接參數 Recommended Hand-Solder Parameters	烙鐵溫度：350℃ +/-5℃ Solder Iron Temperature : 350℃ +/-5℃ 加熱時間：3 seconds max. Heating Time : 3 seconds max.	

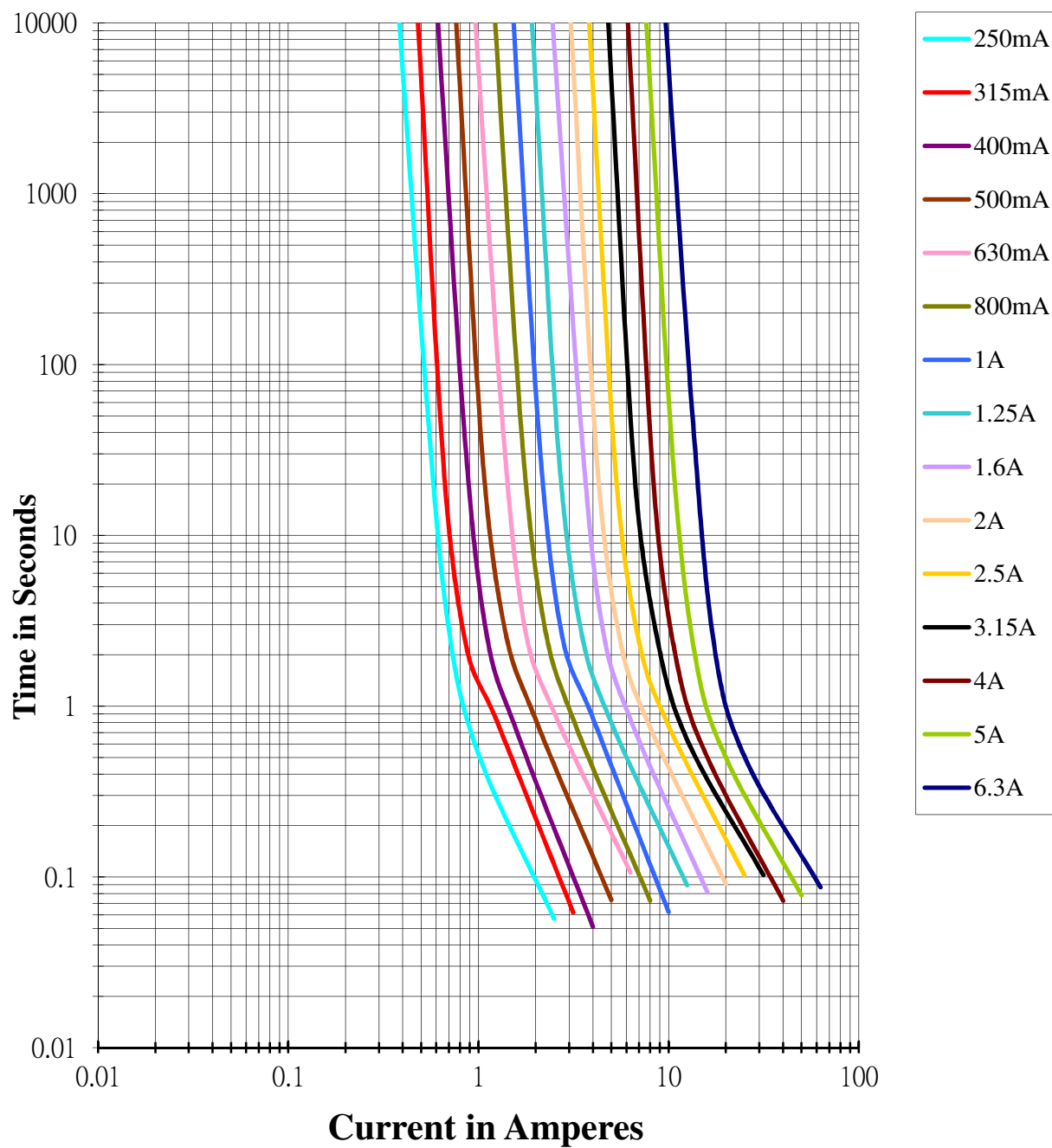
15 備註 Note:

建議焊接方式 Recommend soldering method:



16 IT曲線圖 Clear Time Cuve(I vs t curve)

Melting IT Curves



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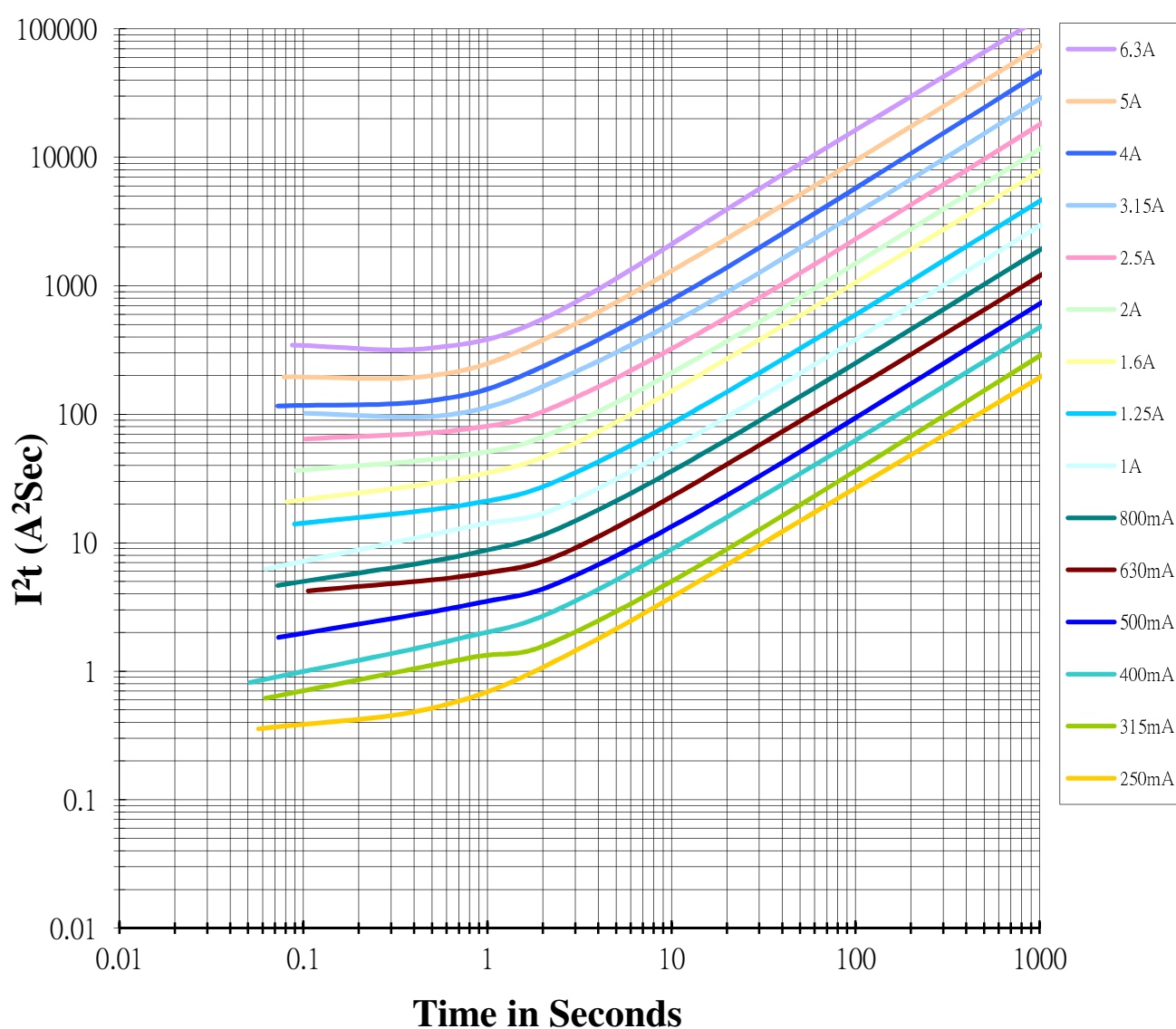
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17 I²T曲線圖 Standing Pulse(I²t vs t curve)

Average Melting I²t Curves



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18 信賴性規範 Product Characteristics & Reliability Tests

Test item	Test Description & Reference
Humidity unload test	MIL-STD-202G , Method 103B , Test Condition A Heat ($40\pm0.5^{\circ}\text{C}$) & High Humidity ($95\pm1\%$ RH), 240 hours , $\Delta R < 15\%$
Thermal shock test	MIL-STD-202G, Method 107g , Test Condition B Temperature setup : $25^{\circ}\text{C} \sim -65^{\circ}\text{C} \sim 25^{\circ}\text{C} \sim 125^{\circ}\text{C}$ Time setup : -65°C (30min) $\sim 25^{\circ}\text{C}$ (5min) $\sim 125^{\circ}\text{C}$ (30min) $\sim 25^{\circ}\text{C}$ (5min) 5 cycles , $\Delta R < 15\%$
Vibration test	MIL-STD-202G , Method 201A Frequency setup : $10 \sim 55 \sim 10\text{ Hz}$ Time setup : 1 Minutes/cycle (X-Y-Z,120 Cycles) 6hrs, $\Delta R < 15\%$
Salt spray Test	MIL-STD-202G , Method 101E , Test Condition A Salt spray concentration : $5 \pm 1\%$ Test liquid temperature : $35 \pm 0.5^{\circ}\text{C}$ 96hrs, $\Delta R < 15\%$
Solderability test	Reference IEC 60068-2-20 Temperature setup : $250 \pm 3^{\circ}\text{C}$, $3 \pm 0.3\text{ sec}$ After test terminal electrode wetting area must be greater than 95%
Resistance to Solder Heat Test	Reference IEC 60068-2-20 Temperature setup : $260 \pm 3^{\circ}\text{C}$, $10 \pm 1\text{ sec}$ $\Delta R < 15\%$