



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

規格書

Specification For Approval

Spec. No. SFA055

品名： **MSF** 系列 快速型保險絲

Type： **MSF** *Fast Acting Radial Lead Micro Fuse Series*

www.conquer.com.tw

五股廠：新北市五股區五權五路26號(新北產業園區)
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History of Change

REV.	Description	Date	Drawn	Designed	Checked	Approved
1	新增規格書	2010.06.15	邱俊傑	葉志浩	蔡進義	蔡其湖
2	修改成品尺寸公差 由8.35±0.2→8.35±0.5mm	2011.05.18	邱俊傑	葉志浩	蔡進義	蔡其湖
3	安規到期不續，故移除安規 	2012.05.30	邱俊傑	葉志浩	蔡進義	蔡其湖
4	1. 冷阻值表示方式由參考值變為範圍 2. 增加焊接參數、曲線圖與信賴性規範	2014.04.21	彭彥鳴	葉志浩	蔡進義	蔡其湖
5	增加I ² t數值	2014.08.28	彭彥鳴	邱俊傑	蔡進義	蔡其湖
6	修正I ² t數值	2015.08.04	黃建訓	邱俊傑	蔡進義	蔡其湖
7	增加10.3操作溫度範圍	2016.07.26	彭彥鳴	邱俊傑	蔡進義	蔡其湖

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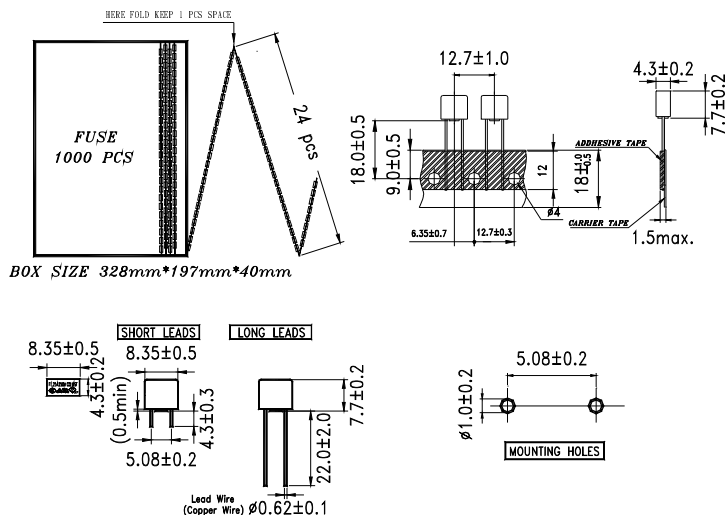
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~ 立式微小保險絲 ~
Fuses for Instrument, Power and Telephone (Non-indicating)

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立式微小熔斷保險絲。
 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.



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: 50mA~6.3A

3 **材料** Material:

3.1 上蓋: 不透明塑膠套蓋且不可破裂或變形。

Cap: Non-Transparent plastic Cap. No breaking or deformation is allowed.

3.2 下座: 不透明塑膠底座且不可破裂或變形。

Base: Non-Transparent plastic base. No breaking or deformation is allowed.

3.3 兩端端腳: 須以導電率良好之鍍錫銅為材料。

Two copper leads: Made of tin-plated copper wire for good conductivity.

NO.	Part Name 部品名稱	Volume 數量
A	Plastic Cap – Black 塑膠套蓋 – 黑色	1
B	Plastic base – Black 方形底座 – 黑色	1
C	Fuse Element 可熔體	1
D	Two copper leads 兩端端腳	2

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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 3。
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 (IEC 60127-3 sheet 3)
- 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.
50mA~5A	60min	30min	10ms	3sec	3ms	300ms		20ms
6.3A	60min	30min	10ms	5sec	3ms	300ms		20ms

5 機械特性 Mechanical Properties:

- 5.1 拉力測試 Tensile Test : 上蓋與下座組合之拉力至少 3 kg。
For the tensile test, the force applied shall be 3 kg at least between cover and base.
- 5.2 推力測試 Thrust Test : 施力為 2 牛頓, 附腳不發生鬆動現象。
For the thrust test, the force applied shall be 2 N, the lead wire.
- 5.3 彎折強度 Bending Test : 附腳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。
No damage are to be visualized after two bends of opposite directions (bending through an angle of 90° and back is defined as one bend) of lead.

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, 本品可承受 $10 I_n$ 電流之突波最少 1ms。
In order to stand transient current caused by inductive or capacitive, the fuses are designed to have minimum clearing time of 1 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 遮斷能力 Breaking Capacity(Interrupting rating):

35 amperes or 10 × rated current ; whichever is greater at 250V AC.

9 包裝 Packing :

1000 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。

1000 pcs in an inner box. The following items indicated on the box. Mark: Catalog number; ratings (voltage, current, interrupting capacity), and safety mark.

10 其他 Other:

10.1 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±5℃ and 35-75% RH.

10.2 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.

10.3 操作溫度 Operating Temperature : -55℃~125℃。

11 標記/安規認證 Mark/ Safety certification:

Mark Approvals							Nominal Resistance Cold Ohms	Nominal Melting I ² t A ² Sec
50 mA	**	**	**		**		2.9379~5.4561	0.000675
63 mA	**	**	**		**		1.9614~3.6426	0.001429
80 mA	**	**	**		**		1.1970~2.2230	0.007258
100 mA	**	**	**		**		0.8120~1.5080	0.009000
125 mA	**	**	**		**		0.7001~1.3003	0.012656
160 mA	**	**	**		**		1.0446~1.9400	0.023040
200 mA	**	**	**		**		0.7676~1.4255	0.032400
250 mA	**	**	**		**		0.4905~0.9109	0.081563
315 mA	**	**	**		**		0.2674~0.4966	0.093768
400 mA	**	**	**		**		0.2104~0.3908	0.129600
500 mA	**	**	**		**		0.1730~0.3212	0.303750
630 mA	**	**	**		**		0.1022~0.1898	0.375071
800 mA	**	**	**		**		0.0728~0.1352	0.691200
1 A	**	**	*	**	**		0.0560~0.1040	0.720000
1.25 A	**	**	*	**	**		0.0407~0.0755	1.125000
1.6 A	**	**	*	**	**		0.0284~0.0528	2.188800
2 A	**	**	*	**	**		0.0231~0.0429	3.600000
2.5 A	**	**	*	**	**		0.0160~0.0298	7.031250
3.15 A	**	**	*	**	**		0.0125~0.0233	8.037225
4 A	**	**	*	**	**		0.0093~0.0173	19.44000
5 A	**	**	*	**	**		0.0076~0.0142	21.37500
6.3 A	**	**	**	**		*	0.0061~0.0113	46.43730

*: 有安規認證 Have safety certify

** : 有安規認證及保險絲上蓋有安規印字標記Have safety certify and safety mark on the cover

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12 系列品名列表 series model list :

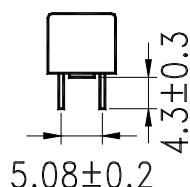
品名 Type	安培數 Ampere Rating
MSF ___A ___V ___	50mA~6.3A

例： MSF A V
 1 2 3 4

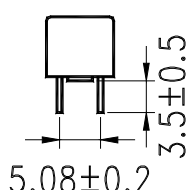
- 1 系列品名 Series Model : MSF
 2 安培數 Ampere Rating : 50mA~6.3A
 3 伏特數 Voltage : 250V
 4 包裝規範 Packaging Code :

包裝規範 Packaging Code	說明 Description
	1000 pcs:打帶(長腳) 1000 pcs on Taped(Long Lead)
(BK)	1000 pcs:散裝(短腳) 1000 pcs in Bulk(Short Lead)
(BK)(3.5)	1000 pcs:散裝(短腳) 1000 pcs in Bulk(Short Lead)
(BK)(7.5)	1000 pcs:散裝(短腳) 1000 pcs in Bulk(Short Lead)

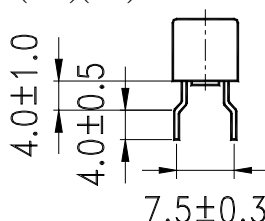
(BK)



(BK)(3.5)



(BK)(7.5)



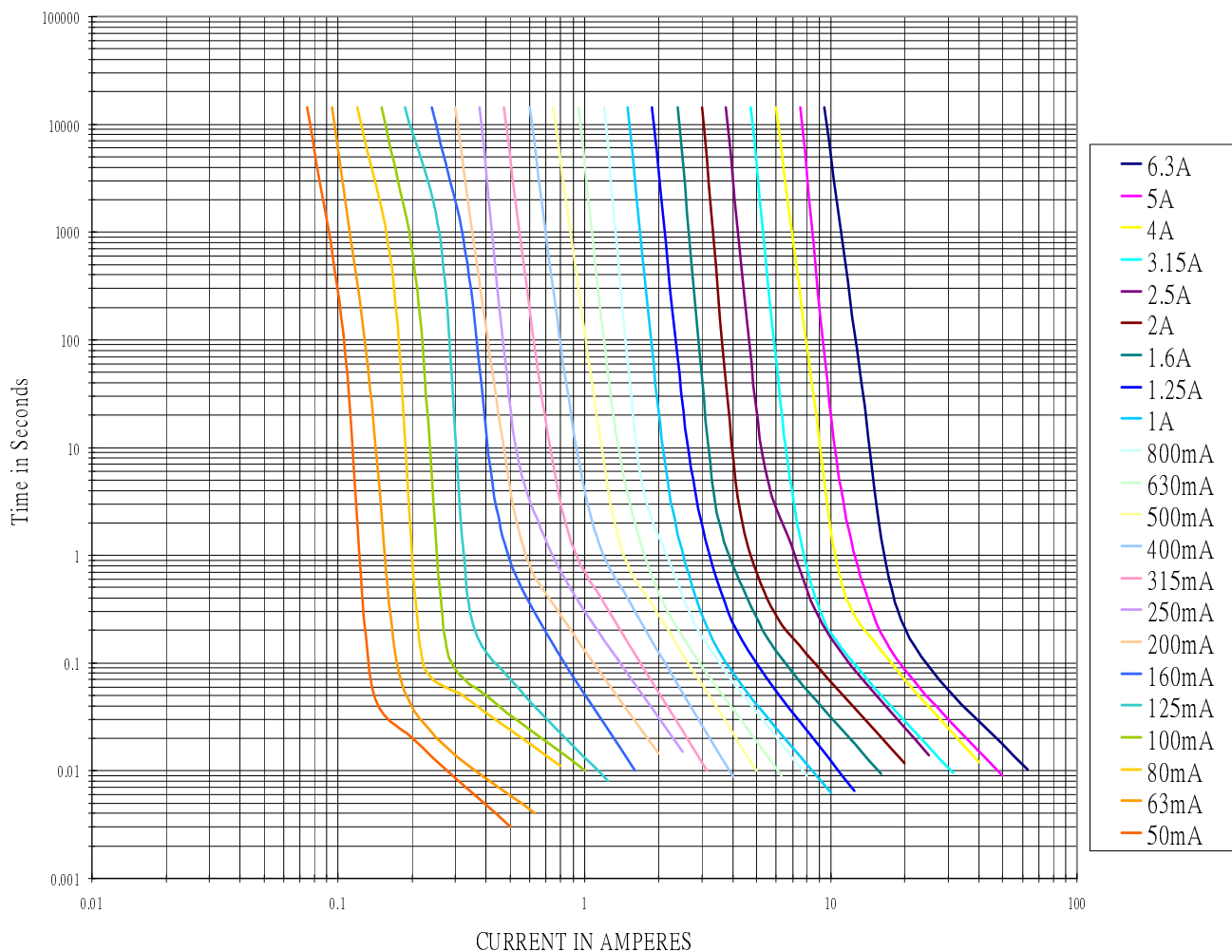
13 建議生產參數(無鉛焊錫使用) :

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

13.1 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 2~5 seconds Solder Dwell Time: 2~5 seconds
13.2 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：5 seconds max. Heating Time : 5 seconds max.	

14 It曲線圖：

Time Current Characteristic Curve :



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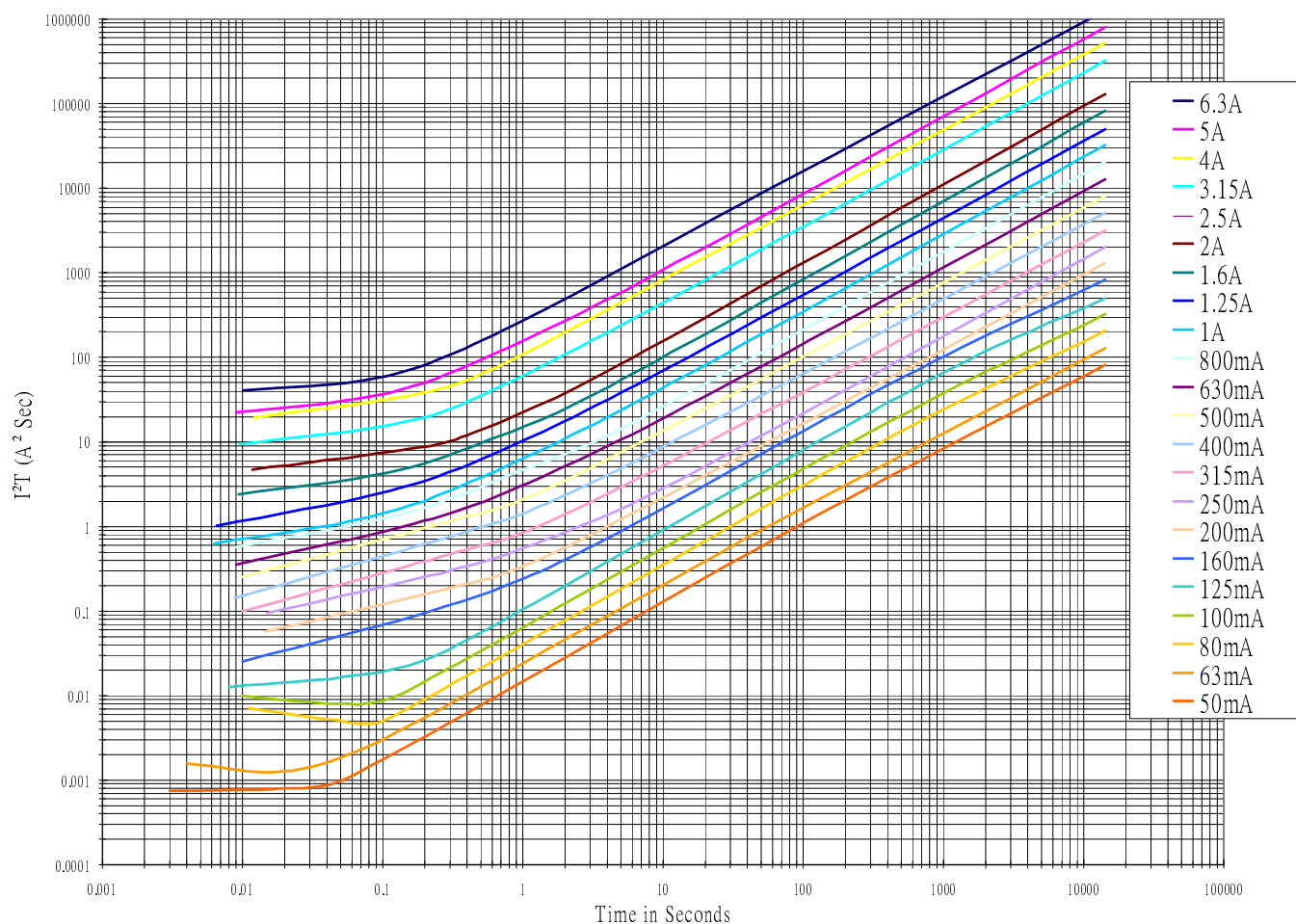
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15 I^2t 曲線圖：

Average Melting I^2t Curves：



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16 信賴性作業規定：

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： $260\pm 3^{\circ}\text{C}$, $10\pm 1\text{ sec}$ $\Delta R<15\%$

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