



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

規格書

Specification For Approval

Spec. No. SFA092

品名：**SEH 40A 60V** 快速型瓷管保險絲

Type：**SEH 40A 60V**

Fast Acting Square Ceramic Surface Mount Fuse

www.conquer.com.tw

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History of Change

REV.	Description	Date	Drawn	Designed	Checked	Approved
1	(1) Issue	2015.09.09	陳志強	邱俊傑	蔡進義	蔡其湖

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～ 筒管狀保險絲 ～

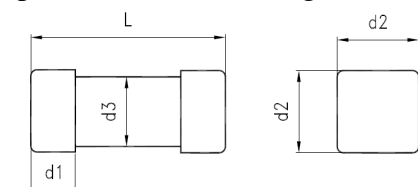
Fuses for Instrument, Power and Telephone (Non-indicating)

1 適用範圍 Available Range:

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。
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: 60V DC

2.3 額定電流 Rated Current: 40A

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: 銅蓋部份鍍銀。

Coating of brass caps: Plating the surface with silver.

SEH Series

NO.	Part Name 部品名稱	Volume 數量
A	Square Cap - Silver Plating 方型銅帽 - 鍍銀	2
B	Square Ceramic Tube - Non-Transparent Ceramic 方型瓷管 - 不透明瓷管	1
C	Fuse Element 可熔體	1
d1	Height of Cap - 2.80±0.20 mm 銅帽高度	
d2	Dimension of Cap - 4.45±0.20 mm 銅帽尺寸	
d3	Dimension of Ceramic - 3.95±0.20 mm 瓷管尺寸	
L	Body of Fuse - 12.30±0.40 mm 本體尺寸	



4 電氣特性 Electrical Characteristics:

4.1 負載容量 Loading Capacity:

通過額定電流值 100 % (亦即 $1.0 \times I_n$ A) , 能繼續通電至少 4小時無任何熔化現象。

Loading 100% Rated Current (i.e. $1.0 \times I_n$ A) for flowing, and it's available to let current keep on flowing at least 4 hour without any melting. (Can keep 4 Hour minimum)

4.2 溫度特性 Temperature:

通過額定電流值100%(亦即 $1.0 \times I_n$ A)1.5小時，繼續維持原加之電流，每隔十分鐘測試一次，連續測三次，溫度不得升高，若使用熱偶式測量方法，
(Thermocouple method) 則本體溫升在 175K 以下。

Loading the 100 % ($1.0 \times I_n$ A) for 1.5 hours, keep testing it with the original current every 10 minutes. Continue to test it for 3 times. The temperature is not allowed to be higher. The main temperature rise is below 175K by way of thermocouple method.

4.3 過載熔斷 Melting due to Overloading:

請參照下表。 Details as Follows Table.

※最大熔斷時限 Operating Characteristics

安培數 Rating	100% Rating		200% Rating	
	Min.	Max.	Min.	Max.
40A	4 Hr			60 sec

5 機械特性 Mechanical Properties:

拉力強度 Terminal Strength:

當施加軸拉力1.5kg於兩端銅帽，無鬆動或損壞現象發生。

Caps are soldered (adhered) to withstand axial pulling force of 1.5kg without loosening or any harmfulness to firmly attachment.

6 脈波實驗 Cycle Test (On-Off Test):

本實驗乃保證產品之壽命與可靠度，施加60%額定電流之脈波，1分鐘ON，2分鐘OFF，1000次以後，本品不熔斷且內阻變化20%以下。

This test is designed to assure a reliable fuse, Controls are set giving 60% of rated ampere.

1 minute ON, 2 minutes OFF per time, the fuse will not open before 1000 times and the internal resistance change will be below 20%.

7 遮斷能力 Interrupting Rating:

40A : 600 amperes at 60V DC

8 包裝 Packing:

打帶軸裝：SEH 1500pcs/軸(13")/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。

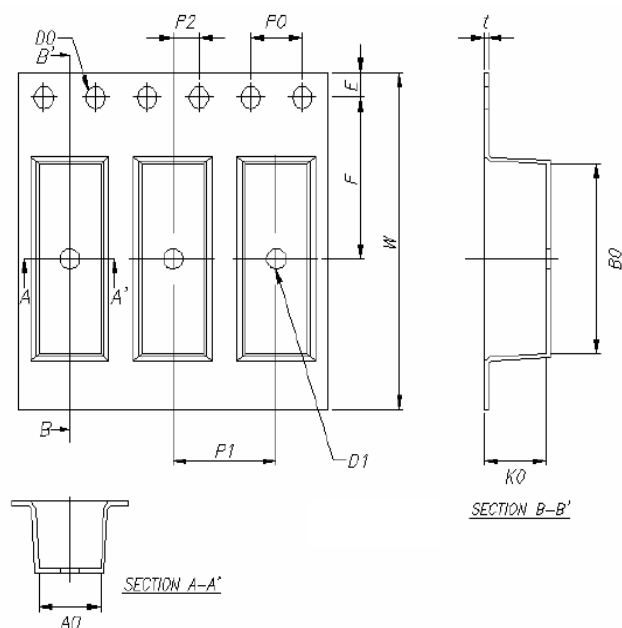
Tape in reel: SEH 1500pcs in a reel(13") in an inner box.

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.



Item	W	P1	E	F	D0	D1	P0	P2	t	K0	A0	B0
Spec	24.00	8.00	1.75	11.50	1.50	1.50	4.00	2.00	0.35	4.80	4.80	13.50
Tolerance	+0.30	+0.10	+0.10	+0.10	+0.10	+0.10	+0.10	+0.10	+0.05	+0.10	+0.10	+0.10
	-0.30	-0.10	-0.10	-0.10	-0.00	-0.10	-0.10	-0.10	-0.05	-0.10	-0.10	-0.10

(Unit: mm)

9 其他 Other:

- 9.1 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 $25\pm5^{\circ}\text{C}$ and 35-75% RH.
- 9.2 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.
- 9.3 使用於此產品之材料中，使用高溫熔化型之焊錫，此焊錫成份中鉛含量大於85%，故此產品符合RoHS指令(2002/95/EC)要求之焊錫含鉛量超過85%之排除條款規範。
Because the materials used in these fuses include high melting temperature type solder and this solder contains more than 85% lead (Pb), so these products can conform to the exempts of the requirements of RoHS Directive (2002/95/EC).

10 標記/安規認證 Mark/Safety Certification:

SEH Series

Mark	Approvals	Nominal Resistance Cold Ohms	Nominal Melting I^2T $A^2 \text{ Sec}$
	40 A	0.0010-0.0018	570.00

*: 有安規認證 Have safety certify

印字方式 →



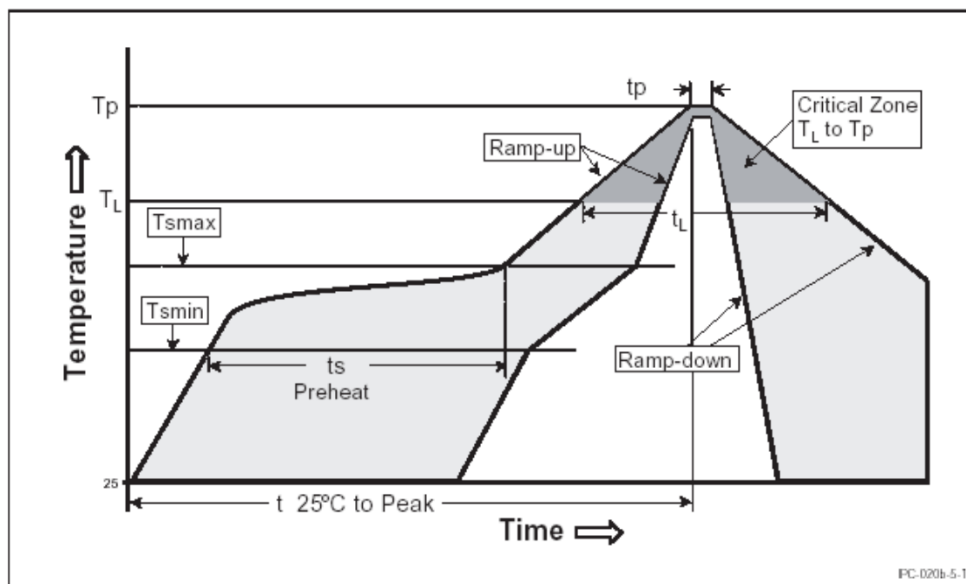
11 系列品名列表 Series Model List :

例: SEH 40A 60V
1 2 3

- 1 系列品名 Series Model : SEH
2 安培數 Ampere Rating : 40A
3 伏特數 Voltage : 60V

12 建議焊接方式及生產參數(無鉛焊錫使用及回流焊)：
 Recommended Soldering Method and Process Parameters
 (for the action to Lead-free solder alloy and reflow soldering) :

12.1 Reflow Soldering : 260°C, 30Sec. max.. See detail in the soldering profile.



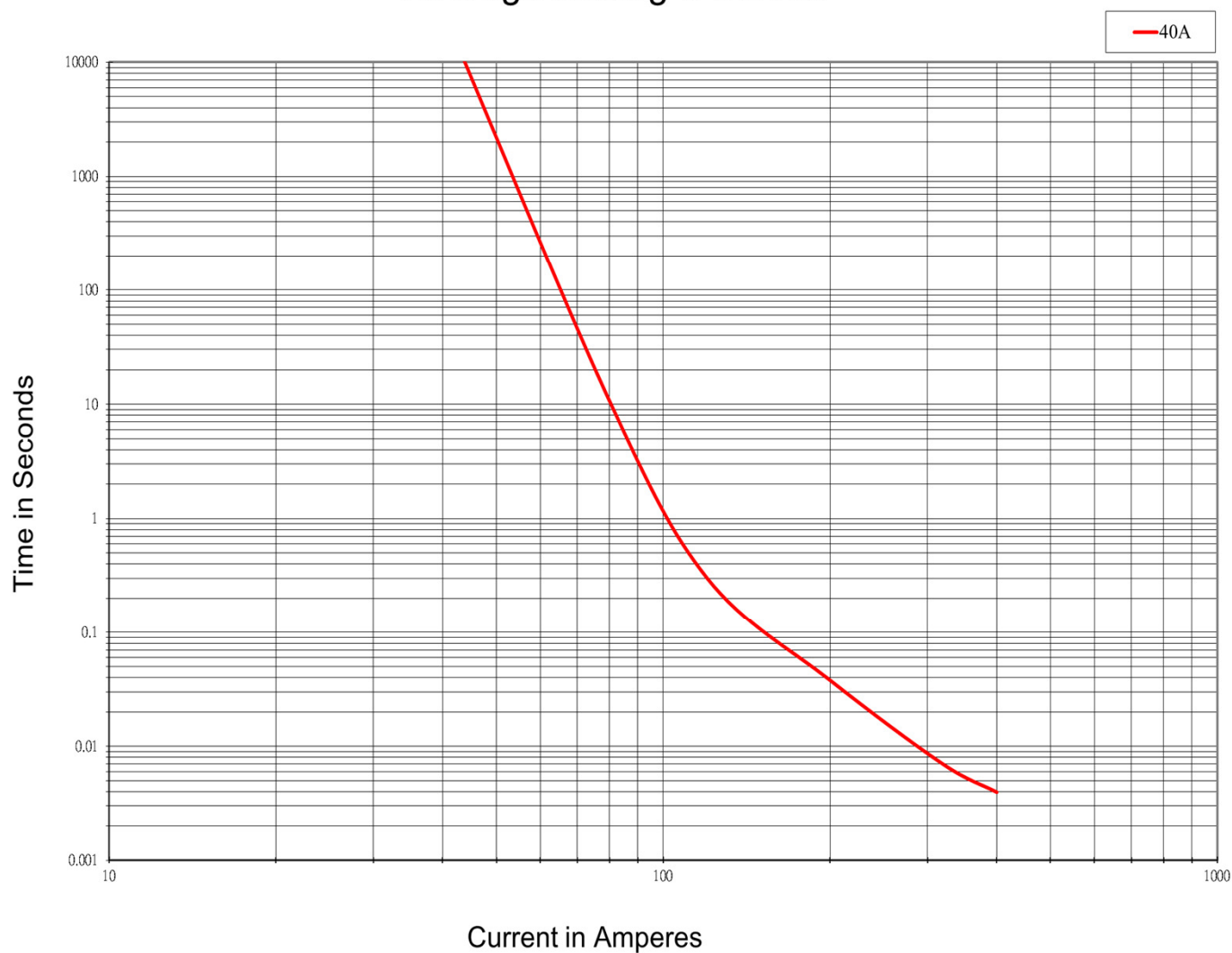
Reflow Condition		Pb-free assembly
Pre-Heat	Temperature Min. (T _{s (min)})	150°C
	Temperature Max. (T _{s (max)})	200°C
	Time (Min to Max) (t _s)	60 - 180 sec
Average Ramp-up Rate (Liquidus Temp (T _L) to peak)		3°C / sec max
T _{s (max)} to T _L -Ramp-up Rate		5°C / sec max
Reflow	Temperature (T _L) (Liquidus)	217°C
	Time (t _L)	60 - 150 sec
Peak Temperature (T _p)		260 +0/-5°C
Time within 5°C of actual peak Temperature (t _p)		10 - 30 sec
Ramp-down Rate		6°C / sec max
Time 25°C to peak Temperature (t 25°C to peak)		8 min max
Do not exceed		260°C

12.2 Wave Soldering : 260°C, 10Sec. max.

12.3 Hand Soldering : 350°C, 3Sec. max.

13 IT曲線圖 IT Curve:

Average Melting It Curves



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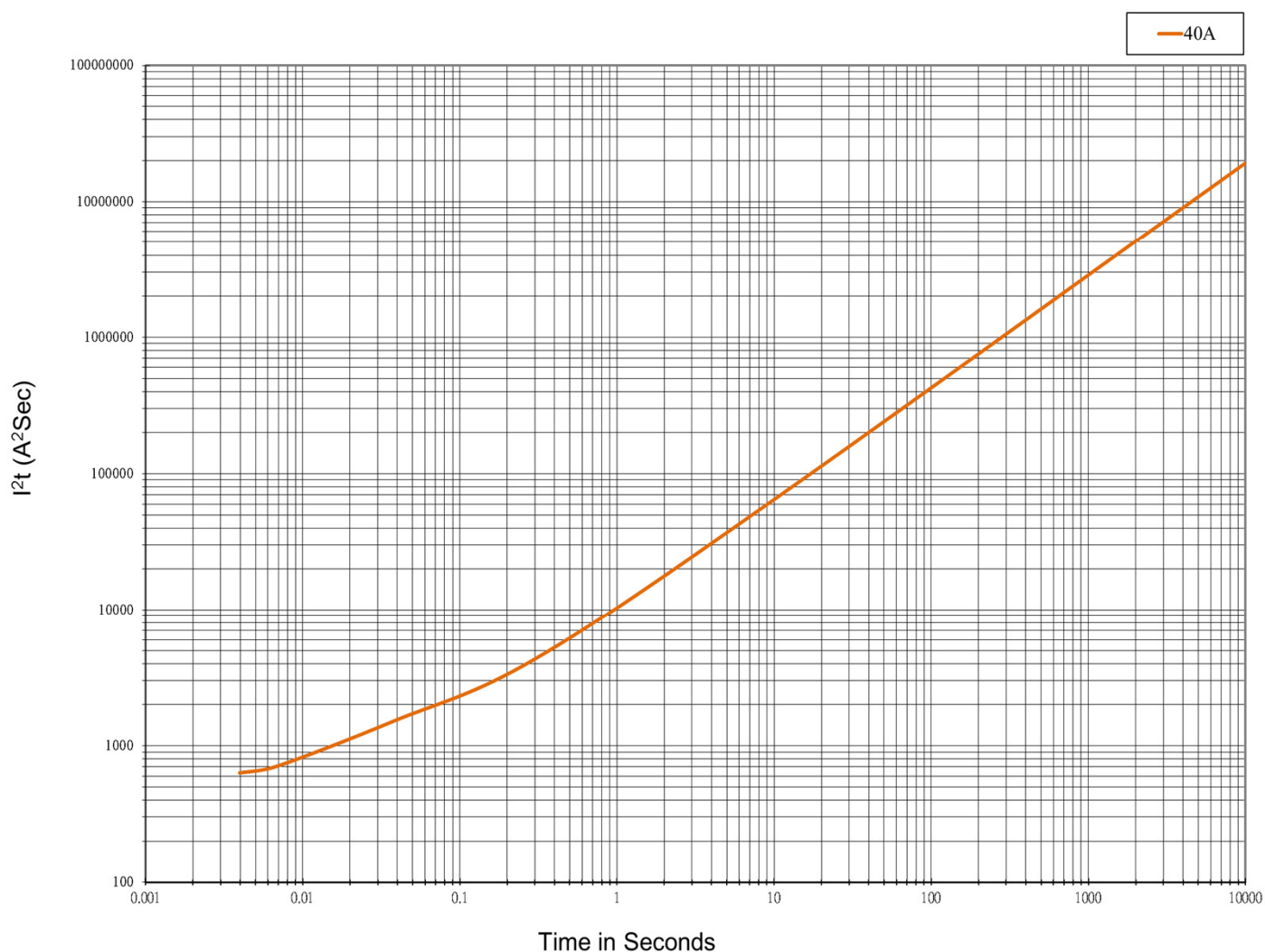
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14 I²T曲線圖 I²t Curve:

Average Melting I²t Curves



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15 信賴性作業測試規定 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 : $10 \sim 55 \sim 10$ 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 60068-2-58 Temperature setup : $250 \pm 5^{\circ}\text{C}$, 3 ± 0.3 sec After test terminal electrode wetting area must be greater than 95 %
Resistance to Solder Heat Test	Reference IEC 60068-2-58 Temperature setup : $260 \pm 5^{\circ}\text{C}$, 10 ± 1 sec $\Delta R < 15\%$