



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

規格書

Specification For Approval

Spec. No. SFA014

品名： AFE/AFP-A 快速型玻璃管保險絲

Type： AFE/AFP-A *Fast Acting Glass Tube 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)
Wugu Factory: No.26, Wucyuan 5th Rd., Wugu Dist.,
(New Taipei Industrial Park) New Taipei City
24888, Taiwan
TEL: +886-2-89902189(Rep.)
+886-2-2CONQUER(Rep.)
FAX: +886-2-8990-2577

北投廠：台北市北投區立德路120巷15號
Peitou Factory: No. 15, Lite Road, Peitou,
Taipei 11259, Taiwan.
TEL: +886-2-2895-8895(代表號)
FAX: +886-2-2895-8880





History of Change

REV.	Description	Date	Drawn	Designed	Checked	Approved
1	(1)發出 Issue	2011.03.07	廖奕璋	邱俊傑	蔡進義	蔡其湖
2	(1)8 遮斷能力 Interrupting Rating 之 12A~30A 新增 200 amperes at 125V ; 100 amperes at 250V	2011.12.13	廖奕璋	邱俊傑	蔡進義	蔡其湖
3	(1) 新增 13 安裝方式及條件 Installation Way and Parameters 及 14 建議生產參數(無鉛焊錫使用)	2014.06.20	廖奕璋	邱俊傑	蔡進義	蔡其湖

Conquer Electronics Co., LTD.

Wugu Factory : No. 26, Wucyuan 5th Road, Wugu Township, Taipei County 248, Taiwan. TEL:+886-2-8990-2189 (代表號) FAX:+886-2-8990-2577

Peitou Factory : No. 15, Lane 120, Lite Road, Peitou, 11248, Taipei, Taiwan. TEL: +886-2-2895-8895 (代表號) FAX:+886-2-2895-8880

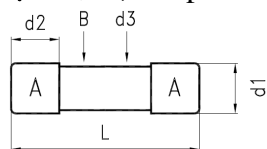
E-mail: conqfuse@ms62.hinet.net Home page: <http://www.conquer.com.tw>

1 適用範圍 Available Range:

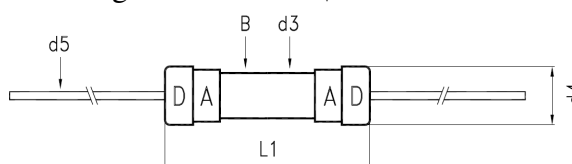
本標準適用於保護儀器、電源供應器和電話機用之筒管式熔斷保險絲。

Available Range: For protecting instruments, power supplies and telephone sets.

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



AFE Series



AFP-A 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/125V/32V

2.3 額定電流 Rated Current: 100mA~30A

3 材料 Material:

3.1 筒管本體: 透明玻璃管不可破裂或變形。

Tube (Body): Transparent glass tube. 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.

NO.	Part Name 部品名稱	Volume 數量
A	Brass Cap - Nickel Plating 銅帽 - 鍍鎳	2
B	Glass Tube - Transparent Glass 玻璃管 - 透明玻璃	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
d1	Dia. of Cap - 6.35±0.1mm 銅頭直徑	
d2	Height of Cap - 6.45±0.1mm 銅頭高度	
d3	Dia. of Glass - 5.62±0.3mm 玻璃管直徑	
d4	Dia. of Cap - 7.00±0.3mm 銅帽直徑	
d5	Dia. of Lead Wire - (註1)±0.05mm 附腳直徑 Length of Lead Wire - 38±2mm 長度	
L	Body of Fuse - 31.75±0.75mm 本體尺寸	
L1	Total Length W/Cap-on on Both Ends 33.0±0.75mm	

Conquer Electronics Co., LTD.

Wugu Factory : No. 26, Wucyuan 5th Road, Wugu Township, Taipei County 248, Taiwan. TEL:+886-2-8990-2189 (代表號) FAX:+886-2-8990-2577

Peitou Factory : No. 15, Lane 120, Lite Road, Peitou, 11248, Taipei, Taiwan. TEL: +886-2-2895-8895 (代表號) FAX:+886-2-2895-8880

E-mail: conqfuse@ms62.hinet.net Home page: http://www.conquer.com.tw

※註1 (Note1)

安培數	腳徑
Ampere Rating	Lead Wire
$\leq 12A$	$\phi 0.8 \text{ mm}$
13A~19A	$\phi 1.0 \text{ mm}$
$\geq 20A$	$\phi 1.2 \text{ mm}$

4 電氣特性 Electrical Characteristics:

4.1 負載容量: 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 Capacity: 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: 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 (※註2) $^{\circ}C$ 以下.

Temperature: 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 (※Note2) $^{\circ}C$ by way of Thermocouple Method.

※註2 (Note2)

10mA~10A $75^{\circ}C$

12A~30A $125^{\circ}C$

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	100% Rating		135% Rating		200% Rating	
	Min.	Max.	Min.	Max.	Min.	Max.
10mA~30A	4 Hrs			1 Hrs		5 sec
Above 30A	4 Hrs			1 Hrs		120 sec

5 機械特性 Mechanical Properties:

5.1 拉力強度:當施加軸拉力720g/cm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 720g/cm without loosening or any harmfulness to firmly attachment.

5.2 彎折強度:

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

Bending Strength:

Diameter of lead wire $\leq 1.0 \text{ mm}$: 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.



(2) 銅帽附腳腳徑1.2mm(含)以上，距離銅帽附腳卯合處10mm以上，作一次90度之彎折，不發生損壞。

Diameter of lead wire ≥ 1.2 mm: Only one bend of an angle of 90° without back shall be tested for each lead wire and the bending position shall be at least 10mm a way from the cap-on. After the test there shall be no damage 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 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%.

8 遮斷能力 Interrupting Rating:

10mA~10A: 10000 amperes at 125V AC

10mA~1A: 35 amperes at 250V AC

1.2A~3.5A: 100 amperes at 250V AC

3.75A~10A: 200 amperes at 250V AC

12A~30A: 300 amperes at 32V AC ; 200 amperes at 125V ; 100 amperes at 250V

9 包裝 Packing:

AFE-500 PCS/盒 ; AFP-A-250 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。

AFE-500 pcs in an inner box. ; AFPA-250 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.

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 $25 \pm 5^\circ\text{C}$ 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.

Conquer Electronics Co., LTD.

Wugu Factory : No. 26, Wucyuan 5th Road, Wugu Township, Taipei County 248, Taiwan. TEL:+886-2-8990-2189 (代表號) FAX:+886-2-8990-2577

Peitou Factory : No. 15, Lane 120, Lite Road, Peitou, 11248, Taipei, Taiwan. TEL: +886-2-2895-8895 (代表號) FAX:+886-2-2895-8880

E-mail: conqfuse@ms62.hinet.net Home page: <http://www.conquer.com.tw>



11 標記/安規認證 Mark/ Safety Certification:

AFE Series

Mark Approvals						Nominal Resistance Cold Ohms
				250V	125V/ 32V	
10 mA	**		**			-
20 mA	**		**			-
30 mA	**		**			-
32 mA	**		**			-
40 mA	**		**			-
50 mA	**		**			-
60 mA	**		**			-
63 mA	**		**			-
70 mA	**		**			-
80 mA	**		**			-
100 mA	**		**			13.790
125 mA	**		**			10.460
150 mA	**		**			7.8300
160 mA	**		**			7.7800
200 mA	**		**			5.2610
250 mA	**		**			3.2340
300 mA	**		**			2.8350
315 mA	**		**			2.3000
350 mA	**		**			2.0000
375 mA	**		**			1.7910
400 mA	**		**			1.4580
500 mA	**		**			0.5955
600 mA	**		**			0.4523
630 mA	**		**			0.4287
700 mA	**		**			0.3500
750 mA	**		**			0.3133
800 mA	**		**			0.2668

Conquer Electronics Co., LTD.

Wugu Factory : No. 26, Wucyuan 5th Road, Wugu Township, Taipei County 248, Taiwan. TEL:+886-2-8990-2189 (代表號) FAX:+886-2-8990-2577

Peitou Factory : No. 15, Lane 120, Lite Road, Peitou, 11248, Taipei, Taiwan. TEL: +886-2-2895-8895 (代表號) FAX:+886-2-2895-8880

E-mail: conqfuse@ms62.hinet.net Home page: <http://www.conquer.com.tw>



AFE Series

Mark Approvals					Nominal Resistance Cold Ohms	
				250V	125V/ 32V	
1 A	**		**	**	**	0.1978
1.2 A	**		**	**	**	0.1445
1.5 A	**		**	**	**	0.1165
1.6 A	**		**	**	**	0.0979
2 A	**		**	**	**	0.0716
2.5 A	**		**	**	**	0.0572
3 A	**		**	**	**	0.0422
3.15 A	**		**	**	**	0.0401
3.2 A	**		**	**	**	0.0396
3.5 A	**		**	**	**	0.0350
4 A	**		**	**	**	0.0313
4.5 A	**		**	**	**	0.0252
5 A	**		**	**	**	0.0230
6 A	**		**	**		0.0205
6.3 A	**		**	**		0.0172
7 A	**		**	**		0.0158
7.5 A	**		**	**		0.0148
8 A	**		**	**		0.0136
10 A	**		**	**		0.0107
12 A		**	**			0.0085
13 A		**	**			0.0074
15 A		**	**			0.0064
16 A		**	**			0.0062
18 A		**	**			0.0049
20 A		**	**			0.0045
25 A		**	**			0.0036
30 A		**	**			0.0024

*: 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

Conquer Electronics Co., LTD.

Wugu Factory : No. 26, Wucyuan 5th Road, Wugu Township, Taipei County 248, Taiwan. TEL:+886-2-8990-2189 (代表號) FAX:+886-2-8990-2577

Peitou Factory : No. 15, Lane 120, Lite Road, Peitou, 11248, Taipei, Taiwan. TEL: +886-2-2895-8895 (代表號) FAX:+886-2-2895-8880

E-mail: conqfuse@ms62.hinet.net Home page: <http://www.conquer.com.tw>



AFP-A Series

Mark Approvals					Nominal Resistance Cold Ohms
10 mA	**		**		-
20 mA	**		**		-
30 mA	**		**		-
32 mA	**		**		-
40 mA	**		**		-
50 mA	**		**		-
60 mA	**		**		-
63 mA	**		**		-
70 mA	**		**		-
80 mA	**		**		-
100 mA	**		**		13.790
125 mA	**		**		10.460
150 mA	**		**		7.8300
160 mA	**		**		7.7800
200 mA	**		**		5.2610
250 mA	**		**		3.2340
300 mA	**		**		2.8350
315 mA	**		**		2.3000
350 mA	**		**		2.0000
375 mA	**		**		1.7910
400 mA	**		**		1.4580
500 mA	**		**		0.5955
600 mA	**		**		0.4523
630 mA	**		**		0.4287
700 mA	**		**		0.3500
750 mA	**		**		0.3133
800 mA	**		**		0.2668

Conquer Electronics Co., LTD.

Wugu Factory : No. 26, Wucyuan 5th Road, Wugu Township, Taipei County 248, Taiwan. TEL:+886-2-8990-2189 (代表號) FAX:+886-2-8990-2577

Peitou Factory : No. 15, Lane 120, Lite Road, Peitou, 11248, Taipei, Taiwan. TEL: +886-2-2895-8895 (代表號) FAX:+886-2-2895-8880

E-mail: conqfuse@ms62.hinet.net Home page: <http://www.conquer.com.tw>



AFP-A Series

Mark Approvals					Nominal Resistance Cold Ohms
1 A	**		**	**	0.1978
1.2 A	**		**	**	0.1445
1.5 A	**		**	**	0.1165
1.6 A	**		**	**	0.0979
2 A	**		**	**	0.0716
2.5 A	**		**	**	0.0572
3 A	**		**	**	0.0422
3.15 A	**		**	**	0.0401
3.2 A	**		**	**	0.0396
3.5 A	**		**	**	0.0350
4 A	**		**	**	0.0313
4.5 A	**		**	**	0.0252
5 A	**		**	**	0.0230
6 A	**		**	**	0.0205
6.3 A	**		**	**	0.0172
7 A	**		**	**	0.0158
7.5 A	**		**	**	0.0148
8 A	**		**	**	0.0136
10 A	**		**	**	0.0107
12 A		**	**		0.0085
13 A		**	**		0.0074
15 A		**	**		0.0064
16 A		**	**		0.0062
18 A		**	**		0.0049
20 A		**	**		0.0045
25 A		**	**		0.0036
30 A		**	**		0.0024

*: 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

Conquer Electronics Co., LTD.

Wugu Factory : No. 26, Wucyuan 5th Road, Wugu Township, Taipei County 248, Taiwan. TEL:+886-2-8990-2189 (代表號) FAX:+886-2-8990-2577

Peitou Factory : No. 15, Lane 120, Lite Road, Peitou, 11248, Taipei, Taiwan. TEL: +886-2-2895-8895 (代表號) FAX:+886-2-2895-8880

E-mail: conqfuse@ms62.hinet.net Home page: <http://www.conquer.com.tw>

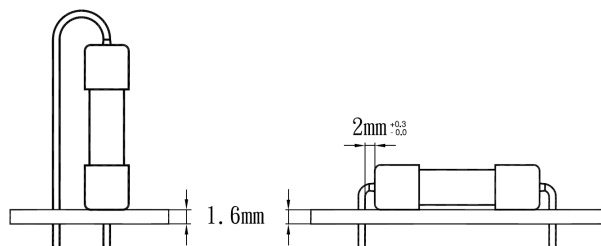
12 系列品名列表 series model list :

品名	安培數
U/C AFE ___A ___V (PF)	10mA~10A
U/C AFP-A ___A ___V (PF)	
URC AFE ___A 32V (PF)	12A~30A
RU AFE ___A 250V (PF)	

例: U/C AFE A V (PF)
 1 2 3 4 5

- 1 安規認證 Safety Approval
- 2 系列品名 Series Model : AFE/AFP-A
- 3 安培數 Ampere Rating : 10mA~30A
- 4 伏特數 Voltage : 250V/125V/32V
- 5 無鉛標示 Pb free : (PF)

13 安裝方式及條件 Installation Way and Parameters:



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

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