



**CONQUER**  
功得電子

# 規格書

## Specification For Approval

Spec NO. SFA604

**型 號：** CRU CQ12LH 系列  
耐突波型陶瓷晶片保險絲

**Model：** CRU CQ12LH Series  
High Inrush SMD L-Type Chip Fuse

Designed in accordance to UL248 standard.

### Conquer Electronics Co., Ltd.

#### 五股廠

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## History of Change

REV.	Description	Date	Drawn	Designed	Checked	Approved
1	新制定文件	2010.10.26	陳佳鈺	翁靜亨	葉志強	葉煥益
2	系列規格阻抗值增加阻值範圍	2014.04.09	陳佳鈺	翁靜亨	葉志強	葉煥益
3	修正規格書格式、新增產品材料	2014.07.15	陳佳鈺	翁靜亨	葉志強	葉煥益
4	修正產品印字增加下底線	2015.12.24	陳佳鈺	翁靜亨	葉志強	葉煥益
5	修正產品包裝載帶尺寸	2019.03.13	陳佳鈺	翁靜亨	葉志強	葉煥益
6	1. 版面重整 2. 新增1.25A規格資訊	2019.07.12	陳泰良	翁靜亨	葉志強	葉煥益

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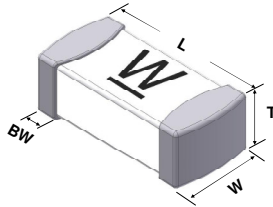
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**1 適用範圍 Applications :**

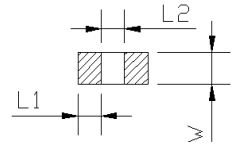
- 1.1 液晶顯示器 LCD Display 【Monitor, Notebook】
- 1.2 電腦週邊 PC Appliance  
 【Laptop Computer, Word Processor, CD Drive, MO Drive, Laser Printer and Ink Jet Print】
- 1.3 攜帶型通訊 Portable Communication Machinery  
 【PDA, Mobile Phone and Battery Charge for them】
- 1.4 影音週邊 AV Appliances  
 【DVC, 8mm VC, Digital Camera, Mini Disk Player, Personal Audio Equipment】
- 1.5 遊戲機週邊 Amusement Machine 【Game equipment, Handy Game equipment】

**2 形狀及尺寸 Shape & Dimensions :**

Type	CQ12LH
L	3.1 ± 0.2 mm
W	1.6 ± 0.2 mm
T	0.9 ± 0.3 mm
BW	0.5 ± 0.25 mm

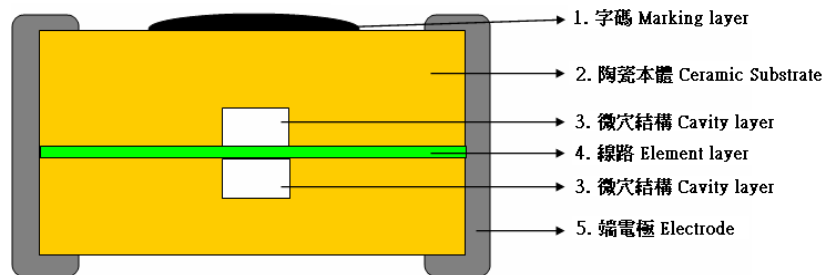


建議銅箔尺寸 Recommended Pad Layout	
L1	1.10 mm
L2	1.52 mm
W	1.78 mm



- 2.1 構造形狀 Structure & Shape : 如上圖 As shown in figure above
- 2.2 額定電壓 Voltage Rating 125V/63V/32V/24V
- 2.3 額定電流 Ampere Rating 1A~20A

**3 材料 Material :**



部件編號	部件名稱	組成材料
1	字碼 Marking layer	玻璃 Glass Powders
2	陶瓷本體 Ceramic Substrate	陶瓷 Ceramic
3	微穴結構 Cavity layer	空氣 Air
4	線路 Element layer	銀 Ag
5	端電極 Electrode	銀 Ag、鎳 Nickel、錫 Tin

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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 x In A )4小時以上，能繼續通電無任何熔化現象。

Loading Capacity : Through the 100 % rating current (1.0 x In A) loading, and keep current continuously without any melting. (Can keep 4 hours minimum)

4.2 溫度特性: 通過額定電流值100%( 亦即 1.0 x In 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200°C 以下。

Temperature: Loading the 100 % (1.0 x In 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 200°C by way of Thermocouple Method.

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

Ampere Rating	Opening Time							
	1In		2In		3In		8In	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1A~20A	4 hr		1 sec	120 sec		3 sec		0.05 sec

5 **突波實驗** Pulse Test :

晶片保險絲的應用，建議客戶端所產生的突波最好小於該保險絲額定電流的5倍。

Surge Test: In order to stand transient current caused by inductive or capacitive.

We suggest application for SMD fuse inrush withstand capacity are better less than 5 times of rating current.

6 **遮斷能力** Breaking Capacity(Interrupting rating) :

1A~8A : 50 amperes at 125V AC/DC

100 amperes at 63V DC

150 amperes at 32V AC

10A~20A : 150 amperes at 24V DC

7 **包裝** Packing :

打帶軸裝 : CQ12LH 4000pcs/軸(7")/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。

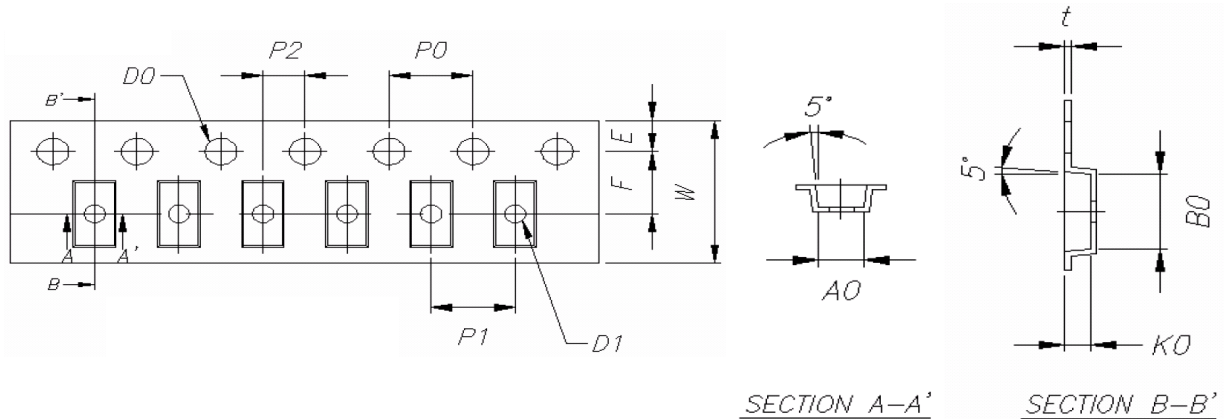
Tape in reel: CQ12LH 4000pcs in a reel(7") in an inner box.

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.

### 7.1 Carrier Tape



Item	W	E	F	D0	D1	P0	P1	P2	P0 x 10	t	A0	B0	K0
Criterion	8.00	1.75	3.50	1.50	1.00	4.00	4.00	2.00	40.00	0.23	1.85	3.56	1.04
Tolerance	± 0.20	± 0.10	± 0.05	± 0.10	± 0.10	± 0.05	± 0.10	± 0.05	± 0.20	± 0.05	± 0.10	± 0.10	± 0.10

## 8 標記/安規認證 Mark/Agency Approvals :

### 8.1 標記 Mark

貼紙 Label



**Ampere Rating**  
**Pcs**  
**Product Code**  
**Product Name**  
 ex : **CRU CQ12LH 1A 125V**


Product Name	Ampere Rating	IR
CRU CQ12LH *A 32V	1A ~ 8A	150A 32V AC
CRU CQ12LH *A 63V	1A ~ 8A	100A 63V DC
CRU CQ12LH *A 125V	1A ~ 8A	50A 125V AC 50A 125V DC
CRU CQ12LH *A 24V	10A ~ 20A	150A 24V DC

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Approvals	Mark		Nominal Cold Resistance(Ohms)	Nominal Melting I <sup>2</sup> t (A <sup>2</sup> sec.)
1 A	<u>H</u>	*	0.1610 - 0.2990	0.170
1.25 A	<u>J</u>	*	0.1190 - 0.2210	0.313
1.5 A	<u>K</u>	*	0.0875 - 0.1625	0.394
2 A	<u>N</u>	*	0.0525 - 0.0975	0.720
2.5 A	<u>O</u>	*	0.0350 - 0.0650	0.938
3 A	<u>P</u>	*	0.0224 - 0.0416	1.350
3.5 A	<u>R</u>	*	0.0189 - 0.0351	1.838
4 A	<u>S</u>	*	0.0126 - 0.0234	2.240
5 A	<u>T</u>	*	0.0091 - 0.0169	3.000
6 A	<u>U</u>	*	0.0063 - 0.0117	4.680
7 A	<u>V</u>	*	0.0056 - 0.0104	6.370
8 A	<u>W</u>	*	0.0049 - 0.0091	8.320
10 A	<u>10</u>	*	0.0042 - 0.0078	12.00
12 A	<u>12</u>	*	0.0035 - 0.0065	17.28
15 A	<u>15</u>	*	0.0021 - 0.0039	29.25
20 A	<u>20</u>	*	0.0014 - 0.0026	52.00

\* : With agency approvals

Note: 1. Measured at  $\leq 10\%$  of rated current and 25°C ambient

2. Melting I<sup>2</sup>t at 1000% of current rating

8.2 安規認證：UL 認證號碼 E82636。

Agency approvals：UL File No. E82636

9 產品描述 Description：

品名	安培數
CRU CQ12LH ___A ___V	1A~20A

例：CRU CQ12LH A V  
           1          2          3          4

1 安規認證 Agency approvals：CRU

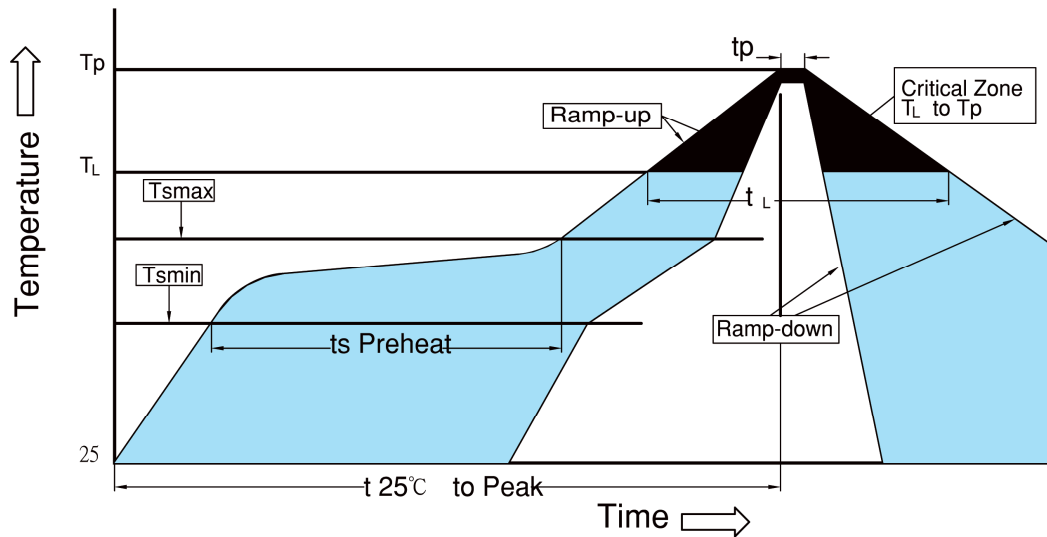
2 系列品名 Series Model：CQ12LH

3 安培數 Ampere Rating：1A~20A

4 伏特數 Voltage：125V / 63V / 32V / 24V

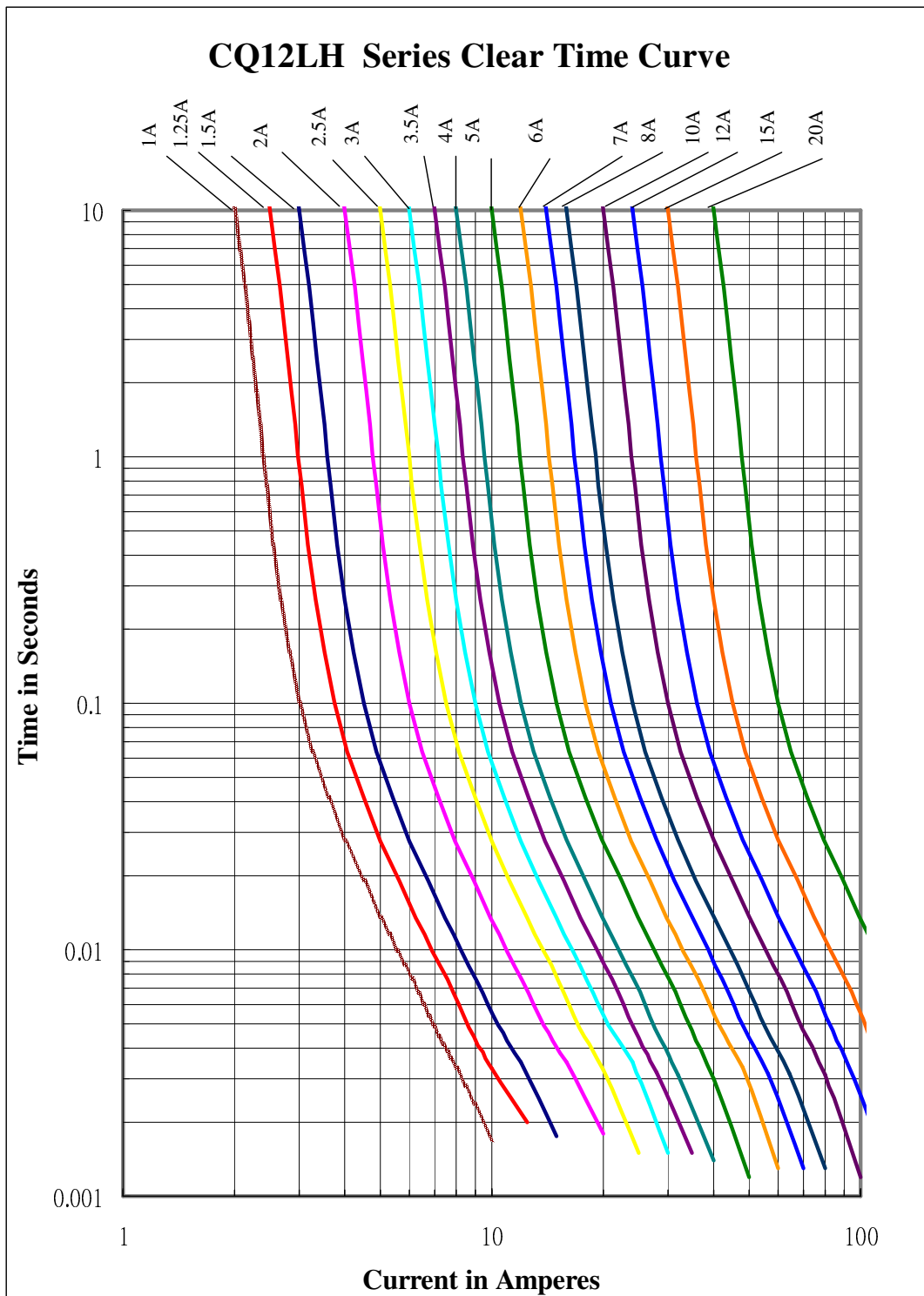
10 建議生產參數 Recommended Applications Parameters(for lead-free solder alloy) :

- 10.1 手焊 Hand soldering : 350°C, 3 Sec. max
- 10.2 波焊 Wave soldering : 260°C, 10 Sec. max
- 10.3 迴焊 Reflow soldering : 260°C, 30 Sec. 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 seconds
Average Ramp-up Rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/second max
$T_s$ (max) to $T_L$ -Ramp-up Rate		5°C/second max
Reflow	Temperature ( $T_L$ ) (Liquidus)	217°C
	Time ( $t_L$ )	60-150 second
Peak Temperature ( $T_P$ )		260 <sup>+0/-5</sup> °C
Time within 5°C of actual peak Temperature ( $t_p$ )		10 ~ 30 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature ( $t_{25^\circ\text{C to peak}}$ )		8 minutes max
Do not exceed		260°C

11 IT曲線圖 Time Current Characteristic Curve :



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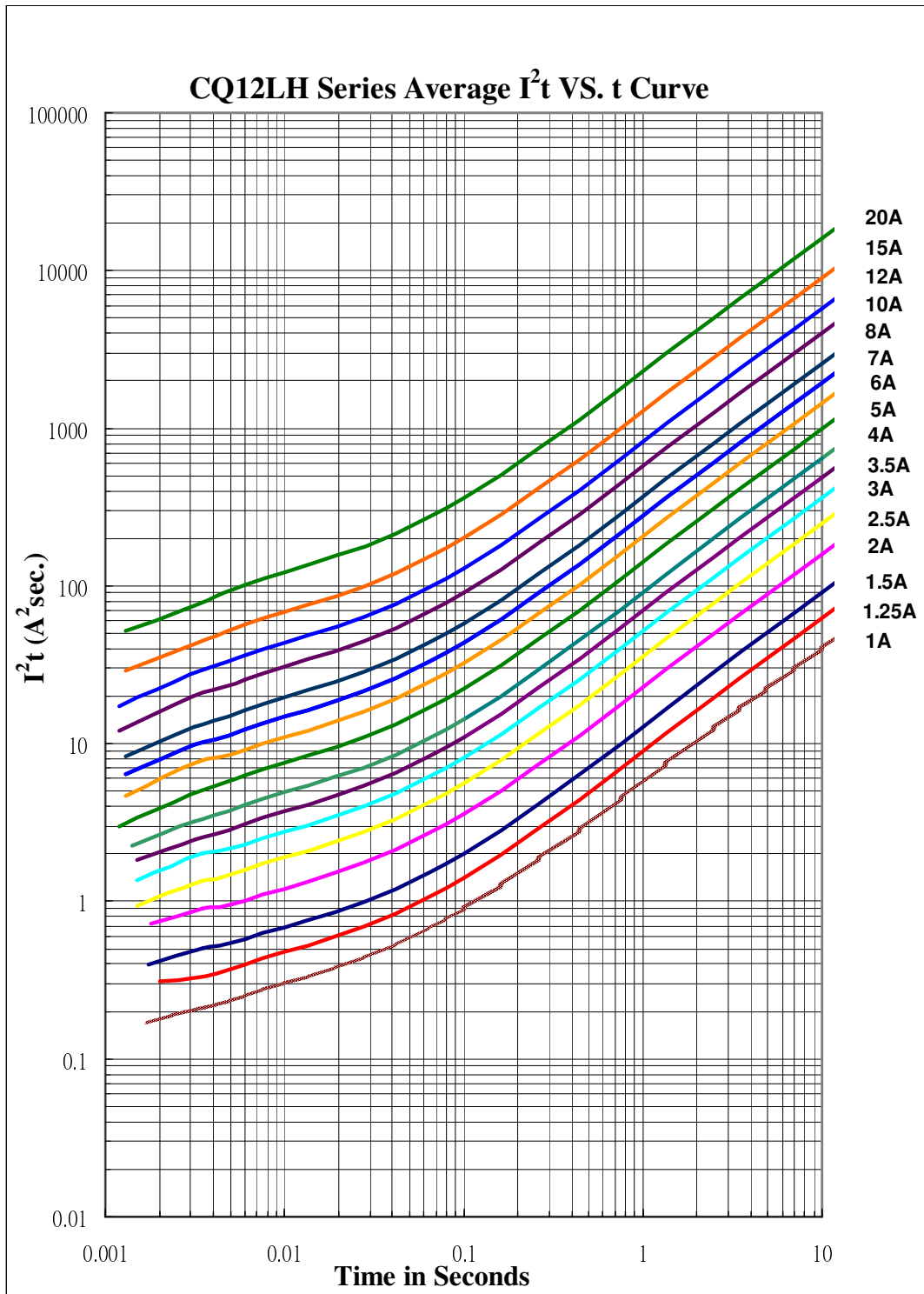
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12 I<sup>2</sup>T 曲線圖 Average melting I<sup>2</sup>t curves :



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### 13 信賴性作業規定 Product Characteristics :

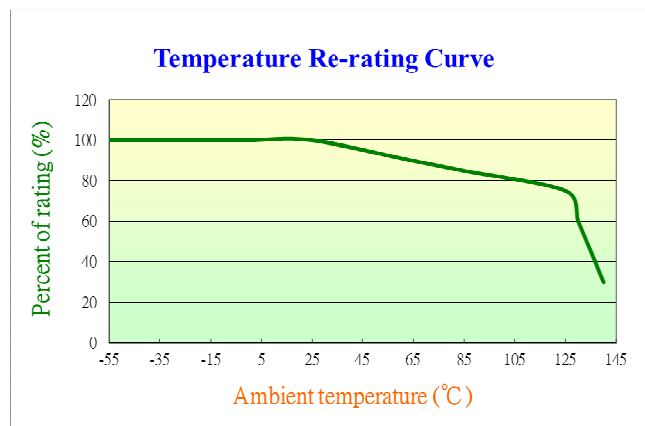
Test item	Test Description & Reference
Humidity unload test	MIL-STD-202G, Method 103B, Test Condition A Heat (85 ± 0.5°C) & High Humidity (85 ± 1% RH), 240 hours, ΔR<15%
Thermal shock test	MIL-STD-202G, Method 107G, Test Condition B Temperature setup : 25°C ~ -65°C ~ 25°C ~ 125°C Time setup : -65°C(30min) ~ 25°C(5min) ~ 125°C(30min) ~ 25°C(5min), 5 cycles, ΔR<15%
Vibration test	MIL-STD-202G, Method 201A Frequency setup : 10 ~ 55 ~ 10 Hz Time setup : 1 Minute/cycle (X-Y-Z · 120 Cycles · 6hours), ΔR<15%
Salt spray test	MIL-STD-202G, Method 101E, Test Condition A Salt spray concentration : 5 ± 1% Test liquid temperature : 35 ± 0.5°C, 96hours, ΔR<15%
Solderability test	Reference IEC 60068-2-58 Temperature setup : 250 ± 5°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 ± 5°C, 10 ± 1 sec ΔR<15%

### 14 溫度曲線圖 Temperature Re-rating curve :

14.1 環境溫度對應電流承載能力，請參照下曲線圖。

Ambient temperature on current-carrying capacity.Details as follows curve.

14.2 工作溫度 Operating Temperature Range : -55°C ~ 125°C



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## 15 其他 Other :

- 15.1 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.
- 15.2 於標準狀況下儲放一年，本品仍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.

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