



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

規格書

Spec. No. SFA102

Specification For Approval

型號： **SEI (G)**系列 方型瓷管保險絲

Model： **SEI (G) Series** *Square Ceramic Surface Mount Fuse*

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.)
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,
Taipei11259, Taiwan.
TEL:+886-2-2895-8895(代表號)
FAX:+886-2-2895-8880



History of Change

REV.	Description	Date	Drawn	Designed	Checked	Approved
1.0	(1) Issue	2017.03.22	林威廷	邱俊傑	蔡進義	蕭順益

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~ 筒管狀保險絲 ~

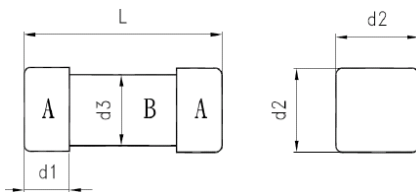
Fuses for Instrument, Power and Telephone (Non-indicating)

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: 250V AC

2.3 額定電流 Rated Current: 500mA ~ 5A

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: 銅蓋部份鍍金。

Coating of brass caps: Plating the surface with Gold.

SEI (G) Series

NO.	Part Name 部品名稱	Volume 數量
A	Square Cap - Gold Plating 方型銅帽 - 鍍金	2
B	Dimension of 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 - 1.75±0.20 mm 銅帽高度	
d2	Dimension of Cap - 3.10±0.20 mm 銅帽尺寸	
d3	Dimension of Ceramic Tube - 2.65±0.20 mm 瓷管尺寸	
L	Body of Fuse - 10.10±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		250% Rating	
	Min.	Max.	Min.	Max.
500mA~5A	4 Hr			120 sec

5 機械特性 Mechanical Properties:

拉力強度 Terminal Strength:

當施加軸拉力1kg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 1kg 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:

500mA~5A : 50 amperes at 250V AC

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8 包裝 Packing:

打帶軸裝：SEI 2500pcs/軸(13")/盒；10000pcs/箱

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。

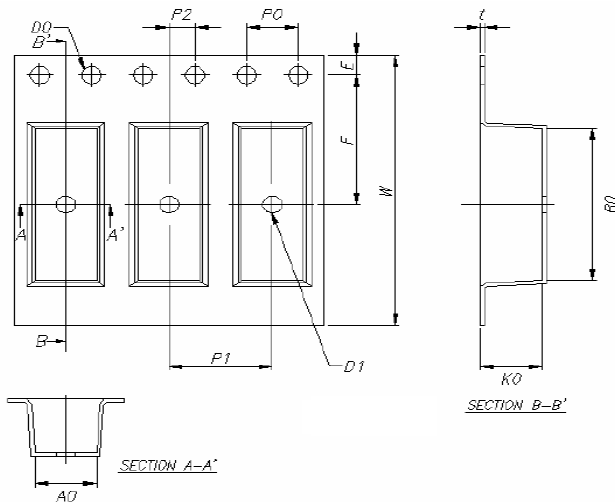
Tape in reel: SEI 2500pcs in a reel(13") in an inner box and 10000pcs in an outer box.

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.



SEI 500mA~5A (G)

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	0.30	3.40	3.40	10.40
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	-0.00	-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 $25\pm 5^{\circ}\text{C}$ 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%，故此產品符合最新RoHS指令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 latest RoHS Directive.

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10 標記/安規認證 Mark/Safety Certification:

SEI (G)

Mark Approvals			Nominal Resistance Cold Ohms	Nominal Melting I ² t A ² Sec
500 mA	*	*	0.3835~0.7123	1.963
750 mA	*	*	0.1820~0.3380	3.375
1 A	*	*	0.1260~0.2340	11.220
1.5 A	*	*	0.0719~0.1335	14.850
2 A	*	*	0.0353~0.0655	19.840
2.5 A	*	*	0.0259~0.0481	20.500
3 A	*	*	0.0196~0.0364	54.000
3.5 A	*	*	0.0139~0.0259	57.820
4 A	*	*	0.0110~0.0205	125.600
5 A	*	*	0.0084~0.0156	185.000

*: 有安規認證 Have safety certify

印字方式 →

CQ SEI ** A

**安培數 Ampere Rating : 500mA~5A

11 產品描述 Product Description :

例: SEI A 250V (G)
 1 2 3 4

- 1 系列品名 Series Model : SEI
- 2 安培數 Ampere Rating : 500mA~5A
- 3 伏特數 Voltage : 250V
- 4 鍍金銅帽 Gold-Plated Cap : (G)

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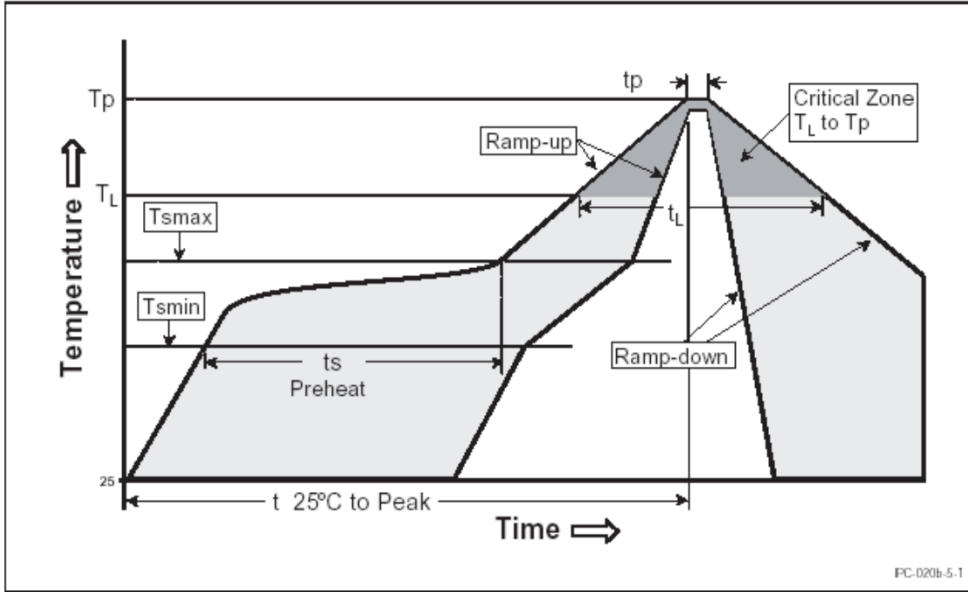
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12 建議生產參數(無鉛焊錫使用及回流焊)：

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.



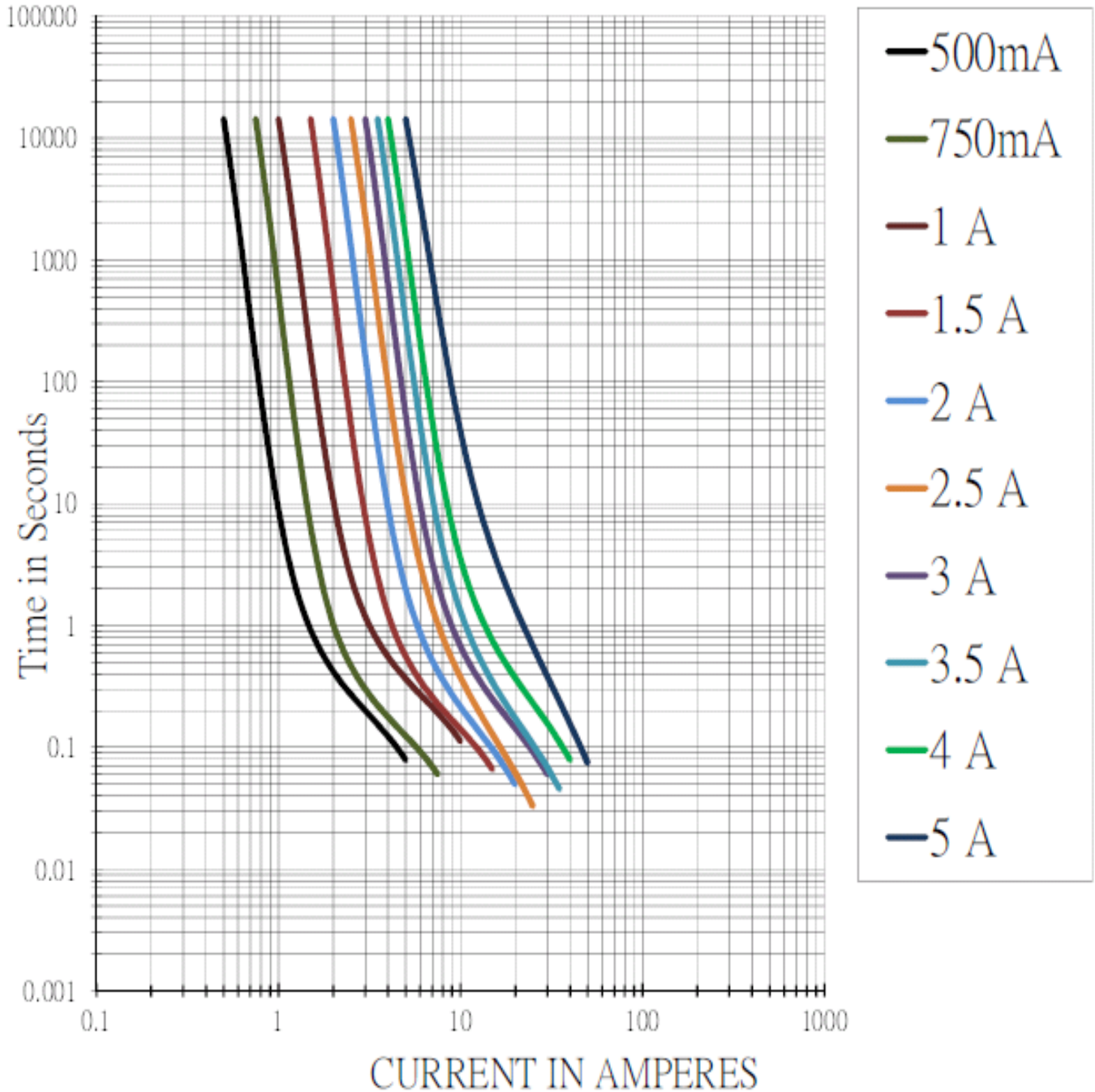
Reflow Condition		Pb-free assembly
Pre-Heat	Temperature Min. (T _{s (min)})	150°C
	Temperature Max. (T _{s (max)})	200°C
	Time (Min to Max) (t _s)	60 - 180 sec
Average Ramp-up Rate (Liquidus Temp (T _L) to peak)		3°C / sec max
T _{s (max)} to T _L -Ramp-up Rate		5°C / sec max
Reflow	Temperature (T _L) (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, 3Sec. max.

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

13 IT曲線圖 Clear Time Curve (I vs t curve):

Time Current Characteristic Curve



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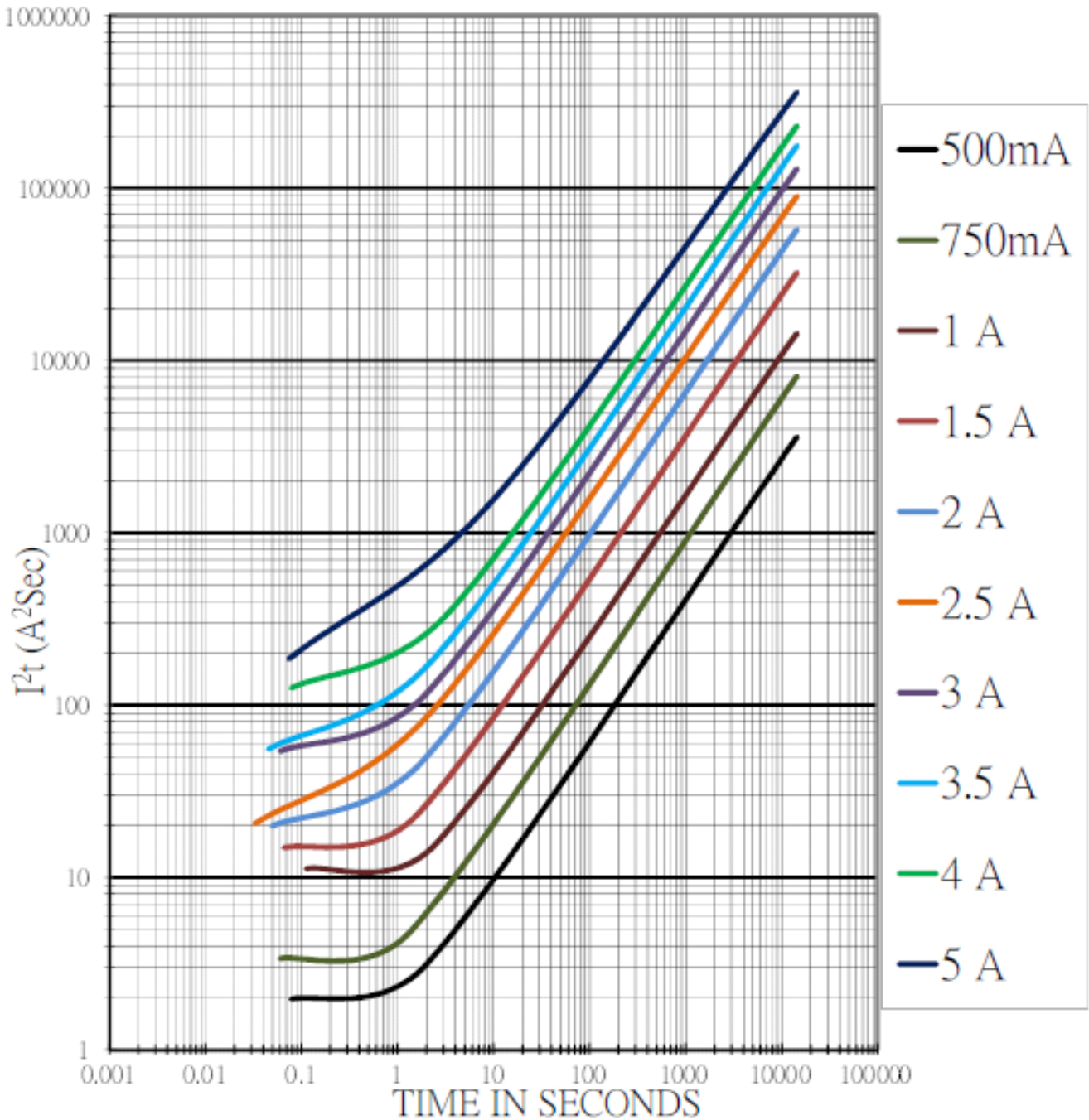
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14 I^2t 曲線圖 Standing Pulse (I^2t vs t curve):

Average Melting I^2t 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±0.5°C) & High Humidity (95±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 Minutes/cycle (X-Y-Z,120 Cycles) 6hrs, 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 96hrs, 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%