PRODUCT SPECIFICATION

(產品規格書)

產品名稱 Description	產品料號 Part No.	圖號 Drawing No.
9397 Series Power 90A Connector	9397-1P06S25B7SAA01	9397-DP06S25-001
	9397-2P06S25B7PAA01	9397-DS25P06-002

PRODUCT NAME (產品名稱)	DOCUMENT No.: (文件編號)	Rev. (版本)	OUPIIN (歐品)
9397 Series Power 90A Connector (RoHS)	Q9397-PSS-001	A (I800)	
	Approved (核准)	Checked (審核)	Prepared (製作)
	Q.A. Section Chief	Ruru Chen	2022.04.29

1. SCOPE 範圍

This product specification defines the product performance and the test methods to ascertain the performance of the Power 90A Connector, which is designed and manufactured by Oupiin Electronic Co.,Ltd. This product specification is applicable but not only for those part numbers which be shown in the cover page.

本產品規格書規定了由歐品電子有限公司生產的 Power 90A 型連接器，產品的特性及測試方法。本產品規格書適用於但不局限於封面所顯示的產品料號。

2. REFERENCE DOCUMENTS 參考文件

MIL-STD-1344	Test method for electrical connector 電子連接器測試方法
MIL-STD-202	Test method for electrical components 電子零件測試方法
EIA364	Test method for electrical components 電子零件測試方法
JIS C 0051	Test method for electrical components 電子零件測試方法
MIL-G-45204C	Specification for gold plating 鍍金規格
IEC-512-3	IEC standard for current carrying capacity tests IEC 電流測試標準
QQ-N-290A	Specification for nickel plating 鍍鎳規格
MIL-P-81728A	Specification for tin/lead plating 鍍錫鉛規格
MIL-T-10727B	Specification for tin plating 鍍錫規格
UL1977	UL standard for safety of attachment plug and receptacle UL 安規要求標準

3. FEATURE & DIMENSIONS 特徵及尺寸

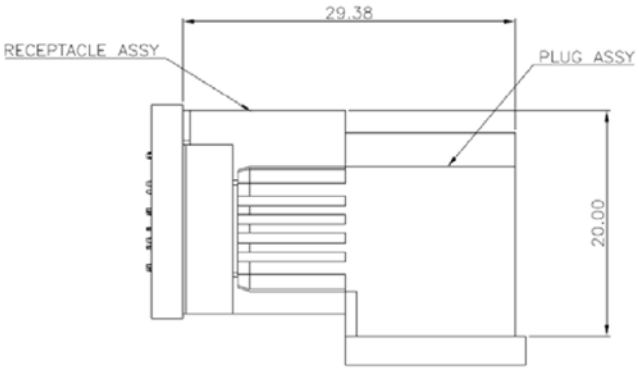
3.1. PRODUCT DIMENSION 產品尺寸

These connectors shall have the dimensions as shown in drawing.

本產品的相關尺寸參考圖面.

3.2. MALE AND FEMALE PRODUCT 公母產品裝配

3.2.1.Male and Female assembly dimension 公母產品裝配尺寸



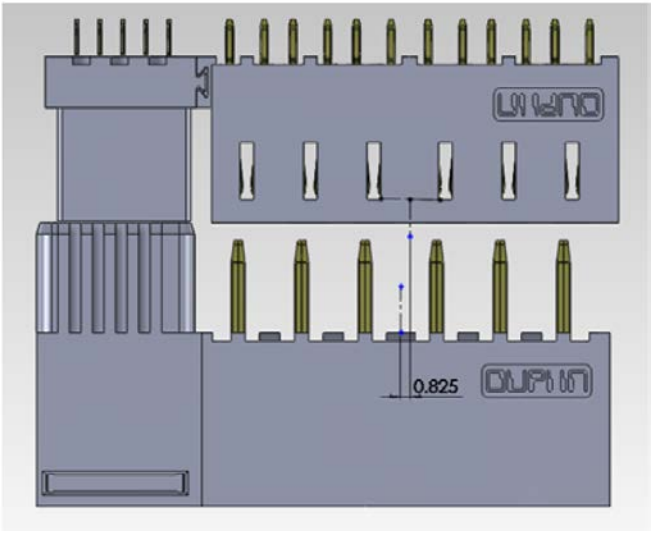
Distance between male and female is 29.38 mm

公母之間的尺寸為29.38 mm

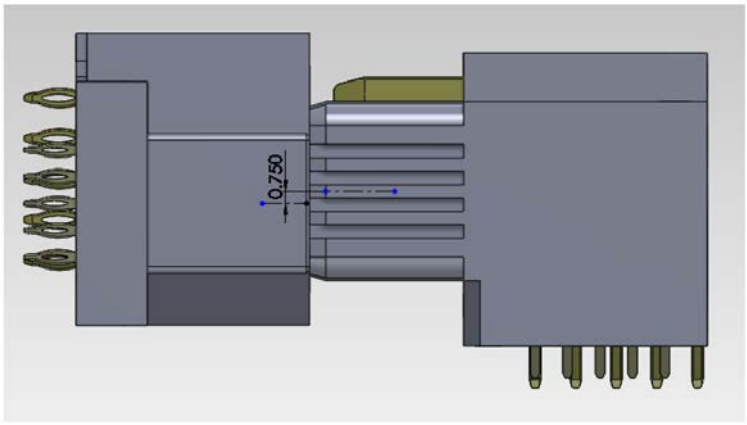
3.2.2 Perpendicular to engaging direction 垂直插入方向

The design of the centering and guiding in the Mpc of the free and fixed board connector modules shall accept a misalignment of 0.825 mm in transverse and 0.75 mm in longitudinal axes of the connector

固定板連接器模件的Mpc裡，連接器設計中心線橫向可接受0.825 mm和縱向可接受0.75 mm的偏差。



allowed misalignment in transverse axes在橫向方向允許對插偏差量

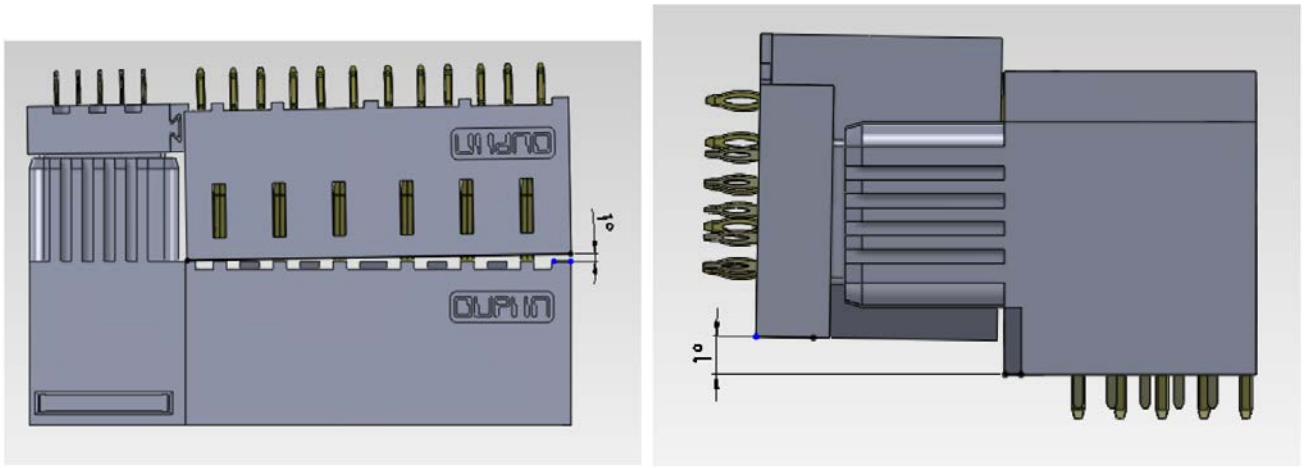


allowed misalignment in longitudinal axes在縱向方向允許對插偏差量

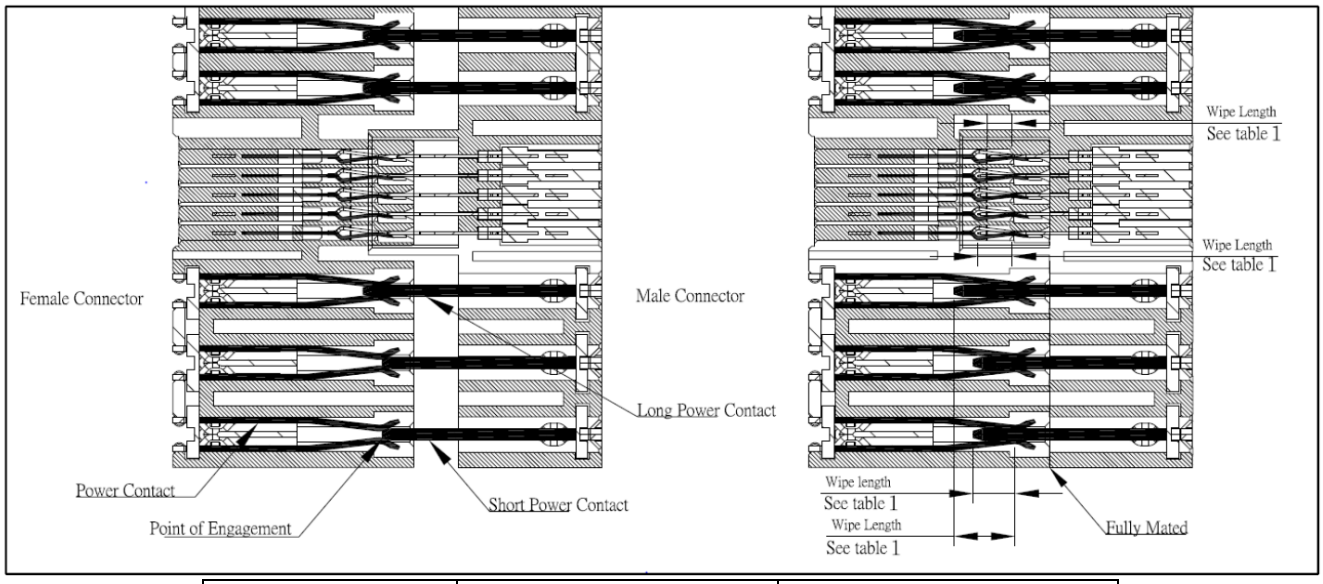
3.2.3 Inclination 傾向

The center and guiding in the Mpc of the free and the fixed board connector modules shall allow an initial angular misalignment of 1° in transverse axes and 1° in longitudinal axes

固定板連接器模件的在Mpc裡，連接器可接受橫向1°和縱向1°的最大傾斜對插角度。



3.2.4 Capability for products wipe length 產品接觸長度等級



Contact	Mating Level	Wipe Length(Min)
Power Pin	1	2.94mm
Signal Pin	1	3.53mm
	2	2.53mm

3.3. PCB/PANEL LAYOUT 印刷電路板佈局

The recommended PCB layout is shown in drawing.
本產品適用的 PCB layout 參考圖面.

3.4. BILL OF MATERIAL 材料清單

Harmful material control follow the requirement of RoHS. The bill of material and product number is described in drawing.
有害物質控制符合RoHS指令要求.本產品使用的材料參見圖面.

3.5. MECHANICAL & ELECTRICAL CHARACTERISTIC 機械及電氣特性

The connector shall have the mechanical and electrical performance as described in drawing.
本產品的機械及電氣特性見圖面

3.6. PACKAGING 包裝

Products shall be packaged according to requirements specified in purchase order for safe delivery, connector container and the packaging method are shown in package specification.
產品可依客戶指定要求包裝，包裝材料與包裝方式參見產品包裝規範

3.7. RATING CURRENT AND RATING VOLTAGE 額定電流與額定電壓

	Rating Voltage	Rating Current
Power (電源)	600VAC	90A
Signal (信號)	250VAC	1A

3.8. STORAGE AND OPERATING TEMPERATURE 儲存與使用溫度

Temperature range：-40°C~+105°C, including terminal temperature rise for rating current.
Storage Temperature：0°C~+40°C, Humidity: 80%RH under, Time limit is 18 months the products are stored.
溫度範圍：-40°C~+105°C，包含接觸端子的額定電流溫升.
儲存溫度：0°C~+40°C，濕度：80%RH以下，產品限存時間為18個月.

4. ENVIRONMENTAL 環境要求

4.1. SOLDERABILITY 可焊性

Connectors meet solder-ability to EIA-364-52.and shall be free of contaminants.
產品可焊性符合 EIA-364-52. 標準規定的相關要求，表面不得有污染物。

4.2. RESISTANCE TO SOLDER HEAT 耐焊接熱

4.2.1. INFRARED REFLOW 紅外線回流焊接

Each cycle consists of three consecutive phases. as shown in Table **III**.
每個焊接週期包括三個連續的階段,見附表三

Note: 說明
Device temperature measurements are referenced from the top-center of the package outer surface.
設備溫度量測時以從頂部中間位置測量為準.

5. PERFORMANCE AND TEST DESCRIPTION 性能及測試

5.1. REQUIREMENT 要求

Product is designed to meet electrical, mechanical, and environmental performance requirements specified in Table I.
本產品設計符合附表一所列的機械，電氣及環境要求.

5.2. TEST CONDITION 測試條件

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.
除非特別註明，所有測試在室溫條件下完成.

5.3. SAMPLE SELECTION 樣品選擇

Test samples shall be selected at random from current production. No test samples shall be reused. Samples are pre-conditioned with 10cycles of durability. Each group shall be containing 5 test samples.
測試樣品從現生產的產品中隨機抽取，所有測試過的樣品不得重複使用. 樣品已預先插拔10次，每組測試有5個樣品.

5.4. TEST SEQUENCE 測試順序

Product qualification test sequence as shown in Table II.
產品品質測試順序見附表二

Table I: Test Requirements and Procedures

附表一:測試要求與方法

Items (項目)	Requirements (要求)	Test Methods (檢測方法)
1. Confirmation of Product (產品確認)	Product shall be conforming to the requirements of applicable product drawing. 產品必須滿足相關檔的規定	Visually, dimensions and functionally inspected per applicable product drawing. 依相關產品圖面，檢查產品的外觀、尺寸及功能。
2. Contact Resistance (接觸阻抗)	Power Pin：0.30 mΩ Max initial. Signal Pin：30 mΩ Max initial. 電源 Pin 初始狀態 0.30 mΩ Max 信號 Pin 初始狀態 30 mΩ Max	Subject mated contacts assembled in housing to closed circuit of 100 mA max and voltage of 20mV max. Per EIA-364-23 所述固定端子連結到一個封閉回路中測試，電流 100 mA max，電壓 20 mV max。 適用：EIA-364-23
3. Insulation Resistance (絕緣阻抗)	Power and Signal Pin：5000 MΩ Min. 電源 PIN 與信號 PIN：最小 5000 MΩ.	Measure by applying test potential between the adjacent contacts, and between the contacts and ground in the mated connector. (500 V DC±10%). Per EIA-364-21 測試產品相鄰端子間以及端子與接地間的電阻 (500 V DC±10%). 適用：EIA-364-21
4. Dielectric Withstanding Voltage (耐電壓)	Power pin must withstand test potential of 1500VDC for 1 minute, current leakage must be 1 mA Max. Signal Pin must withstand test potential of 500 VDC RMS for 1 minute, current leakage must be 1mA Max. Power pin 必須承受測試電壓 1500 VDC，時間 1 分鐘，漏電流不大於 1 mA Signal Pin 必須承受測試電壓 500 VDC RMS，時間 1 分鐘，漏電流不大於 1 mA	Measure by applying test potential between the adjacent contacts, and between the contacts and ground in the mated connector. EIA-364-20 對產品相鄰端子間以及端子與接地間加載電壓，並測試其漏電流。 適用：EIA-364-20

5. Durability (Repeated Mating/Unmated) (耐久性)	After testing, Contact Resistance Maximum Change： Power Pin：0.3 mΩ Max. Signal Pin：10 mΩ Max. 測試後， Power Pin 接觸阻抗最大 0.3 mΩ Signal Pin 接觸阻抗最大 10 mΩ	Repeat mate and unmated for connector 200 cycles, at a speed of 10 cycles per minute. EIA-364-09 重復進行配合產品 200 次插拔，速度每分鐘 10 次 適用：EIA-364-09
6. Contact Retention Force (端子保持力)	Power Pin：1.36 Kg. Min. Signal Pin：0.90 Kg. Min. 電源 Pin 最小 1.36 kg 信號 Pin 最小 0.90 kg	Apply axial pull out force at a speed of 25.4±3 mm/minute on the contact assembled in the housing. Per EIA-364-29 以 25.4±3mm/分鐘的速度施加軸向拉力從塑膠本體上拔出端子 適用：EIA-364-29
7. Mating/Un-mating Force (插入力/拔出力)	Mating force Power Pin：650g/pin Max Signal Pin：90g/pair pin Max. Un-mating force: Power Pin：100g/pin Min (after upper board) Signal Pin：10g/pair pin Min 插入力最大 Power Pin：650g/pin Max Signal Pin：90g/pair pin Max. 拔出力最小 Power Pin：100g/pin Min (打板後) Signal Pin：10g/pair pin Min	At a speed of 25.4±3mm/minute, apply axial insert the mating part into fully or pull out from the subject product. Per EIA-364-37 以 25.4±3mm/分鐘的速度，軸向完全插入對配外掛程式到被測產品中或從被測產品中拔出。 適用：EIA-364-37
8. Normal Force (正向力)	The contact normal force shall not be less than 40 grams per contact 每 PIN 不能小於 40g	Exert the axial pressure from carrying the plastics under the sub radian highest point at the speed of 25.4±3mm / minute. Per EIA-364-04. 以 25.4±3mm/分鐘的速度施加軸向壓力從端子弧度最高處下壓到塑膠面。 適用：EIA-364-04。

9. Compliant Pin Insertion Force (壓接力) Compliant Pin Retention Force (壓接保持力)	Power Pin: 7.98 kg/pin MAX 電源 Pin：7.98Kg/Pin 最大 Signal module: 4.54 kg/pin MAX 信號端子：4.54 Kg/Pin 最大 Power Pin:1.09 Kg/pin MIN 電源 Pin：1.09Kg/Pin 最小 Signal Module：0.50 Kg/pin MIN 信號模塊：0.50Kg/pin 最小	Insert / Pull-out contact at a rate of 25.4±3 mm per minute 以 25.4±3mm/分鐘的速度插入/拔出端子
10. Vibration (機械振動)	After testing, no damage. No electrical discontinuity greater than 1μs shall occur, Contact Resistance: Maximum Change: Signal Contact: 10 mΩ Power Contact: 0.30 mΩ 測試後，產品無損壞，不允許出現超過 1μs 的瞬間斷開，接觸阻抗信號 PIN 最大變化 10 mΩ；電源 PIN 最大變化 0.30 mΩ	Subject mated connector to 20-500Hz traversed at Power spectral density 0.02 g^2/Hz, Overall rms 3.10 g 1 hour each of 3 mutually perpendicular planes, test current at:10mA . Per EIA-364-28. 20-500 Hz, 0.02g^2/Hz, 3.10 g(rms)條件下，在互相垂直的三個面上，每個面 1 小時下測量，測試電流 10 mA 適用：EIA-364-28。
11. Mechanical Shock (機械冲擊)	After testing, no damage. No electrical discontinuity greater than 1μs shall occur, Contact Resistance: Maximum Change: Signal Contact: 10 mΩ Power Contact: 0.30 mΩ 測試後，產品無損壞，不允許出現超過1μs的瞬間斷開，接觸阻抗信號PIN最大變化 10 mΩ；電源PIN最大變化0.30 mΩ	Subject mated connector and shock at 50g with 1/2 sine wave（11 millsecond）shocks in the 3 axes（18 shocks total） Per EIA-364-27 加載 50g 半正弦波，持續 11 毫秒，三個方向共 18 次 適用：EIA-364-TP-27
12. Thermal Shock (溫度冲擊)	After testing, no damage. Contact Resistance: Maximum Change: Signal Contact: 10 mΩ Power Contact: 0.30 mΩ 測試後，產品無損壞，接觸阻抗信號 PIN 最大變化 10 mΩ;電源 PIN 最大變化 0.30 mΩ	Temperature range from -55°C to +85°C. Start from -55°C, after 30 minutes, change to +85°C; change time is no more than 5 minutes, total 10 cycles. Per EIA-364-32 溫度變化範圍：-55°C~ +85°C。從-55°C 開始，30 分鐘後換到+85°C，轉換時間不超過 5 分鍾，共 10 個循環 適用：EIA-364-32

13. Humidity-Temperature Cycle (溫濕度循環)	After testing, no damage. Contact Resistance: Maximum Change: Signal Contact: 10 mΩ Power Contact: 0.30 mΩ 測試後，產品無損壞，接觸阻抗信號 PIN 最大變化 10 mΩ；電源 PIN 最大變化 0.30 mΩ	Subject product to 40°C, 90-95%.R.H , 96H. Per EIA-364-31 產品置於 40℃，相對濕度：90-95%， 循環 96 小時 適用：EIA-364-31
14. Test Temperature Rise for Rating Current (溫升測試)	The temperature above ambient shall not exceed Δ30°C at one point in the system when one power powered. The temperature above ambient shall not exceed Δ30°C at one point in the system when one signal contact are powered. 當一個電源觸點通電時，測試中該點的溫度不得超過Δ30°C。當一個信號觸點通電時，測試中該點的溫度不超得過Δ30℃	a. Ambient conditions Still air at 25°C b. Demand test current is Power Pin 90 Amp, Signal Pin 1 Amp. c. Test time is 8H. Per EIA-364-70 a. 環境條件靜止空氣在 25℃。 b. 求測試電流為 Power Pin 90A, Signal Pin 1A c. 測試時間 8H 適用：EIA-364-70
15. Salt Spray (鹽霧)	After testing, no damage. Contact Resistance: Maximum Change: Signal Contact: 10 mΩ Power Contact: 0.30 mΩ 測試後，產品無損壞，接觸阻抗信號 PIN 最大變化 10 mΩ；電源 PIN 最大變化 0.30 mΩ	5±1% salt concentration(PH=7.0), 48 hours, 35±2°C Per EIA-364-26 鹽水濃度 5±1%(PH=7.0)，時間 48 小時，溫度 35±2℃ 適用：EIA-364-26
16. High Temperature Life (高溫老化)	After testing, no damage. Contact Resistance: Maximum Change: Signal Contact: 10 mΩ Power Contact: 0.30 mΩ 測試後，產品無損壞，接觸阻抗信號 PIN 最大變化 10 mΩ；電源 PIN 最大變化 0.30 mΩ	Subject product to 105°C for 240 hours continuously. Per EIA-364-17 產品置於 105℃，連續 240 小時 適用：EIA-364-17

17. Solder ability (可焊性)	Appearance of the specimen shall be inspected after the test with the assistance of a magnifier capable of giving a magnification of 10 X for any damage such as pinholes, void or rough surface. 5% maximum dewetting 產品在測試完成後，在放大倍數為 10 倍的顯微鏡下，檢查外觀損壞如：小 孔，空焊，外觀粗糙度。 未沾錫區不大於 5%	Soldering time: 5 seconds. Temperature: 245±5°C. Per EIA-364-52. 焊接時間：5 秒 溫度：245±5°C 適用：EIA-364-52

Table II: Product Qualification Test Sequence

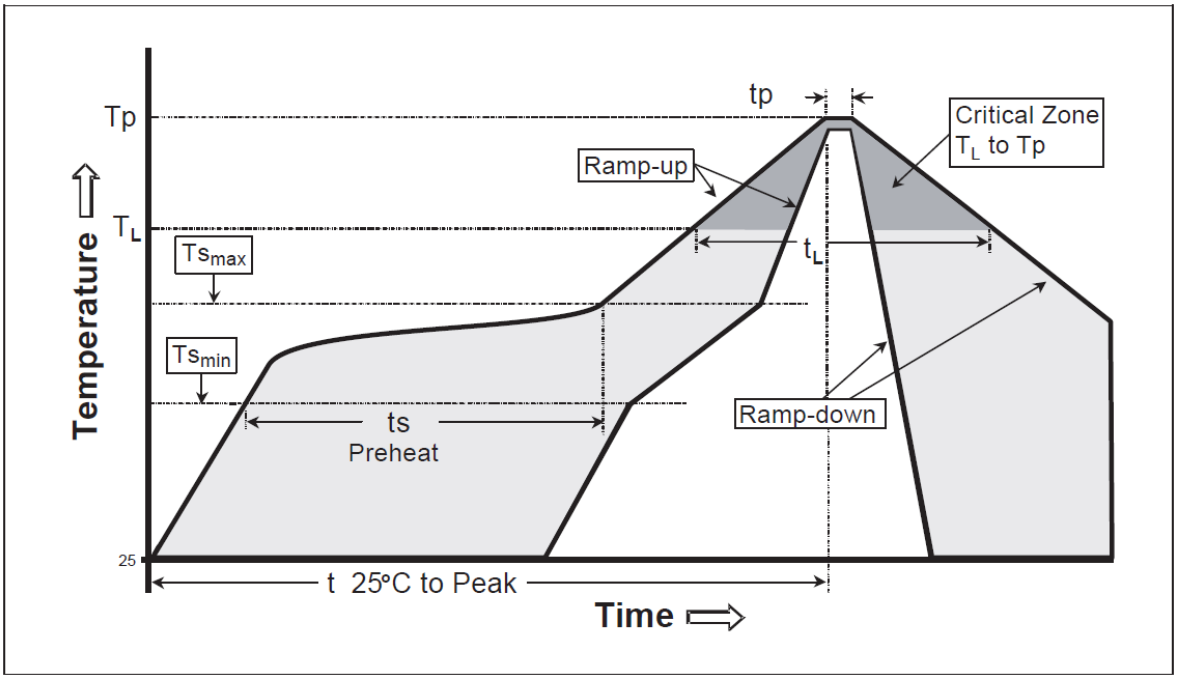
附表二: 產品測試順序

Test Description 測 試 描 述	Test Group 測 試 分 組							
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
1. Conformation of Product 產品確認	**1,6**	**1,11**	**1,8**	**1**	**1,3**	**1**	**1**	**1,3**
2. Contact Resistance 接觸阻抗	**2,5**	**3,6,8,10**		**3,5**				
3. Insulation Resistance 絕緣阻抗			**2,6**					
4.Dielectric Withstanding Voltage 耐電壓			**3,7**					
5.Durability 耐久性		**4**						
6. Contact Retention Force 端子保持力								
7. Mating/Un-mating Force 插入/拔出力		**2,5**		**2,6**				
8. Normal Force 正向力						**3**		
9. Insertion/Retention Force 壓接力/壓接保持力							**2**	
10. Vibration 機械振動	**4**							
11. Mechanical Shock 機械沖擊	**3**							
12. Thermal Shock 溫度沖擊		**7**	**4**					
13. Humidity-Temperature Cycle 溫濕度循環		**9**	**5**					
14. Current rating 溫升測試					**2**			
15. Salt Spray 鹽霧								**2**
16. .High Temperature Life 高溫老化				**4**				
17. Solder-ability 可焊性						**2**		

Table III : Reflow Soldering Profile

附表三：回流焊曲線圖

Parameter (參數)	Reference (參考)	Specification (規格)
Ramp-up (升溫區)	25°C ~150°C	3°C /S Max
Pre-heating (預熱區) Temperature Min(Tsmin) Temperature Max(Tsmax) Time(Tsmin to tsmax)	150℃ ~200℃	60~180 sec
Time maintained above (保持時間) Temperature(TL) Time(tL)	217℃	60~150 sec
Time within 5°C of actual peak Temperature(tp)	260-/+5°C	20~40 sec
Cooling (冷卻區)	Ramp-Down Rate	6°C /S(Max)
Time 25°C to Peak Temperature	25°C ~ Peak Temp.	8 minutes maximum



This profile is the minimum requirement for evaluating soldering heat resistance of components.Heat transfer method used for reflow soldering is hot air convection.The actual air temperatures used to achieve the specified profile largely dependent on the reflow equipment.

這個曲線圖是評估元件器件焊接抗熱的基本要求，應用在對焊接中的熱傳遞方式是熱氣對流，達到特定曲線圖地實際溫度主要依賴與回流焊接設備。