PRODUCT SPECIFICATION

產品規格書

產品名稱 Description	產品料號 Part No.	圖號 Drawing No.
9303-E Series PwrSword ® ULTRA Pro Male / Female DIP Type	9303-E1P07S20B7SAA01	9303-DP02S20P05-001
	9303-E4P07S20B7SAA01	9303-DP05S20P02-003

PRODUCT NAME 產品名稱	**DOCUMENT No.:** 文件編號	**Rev.** 版本	**OUPIIN** 歐品電子
9303-E Series PwrSword ® ULTRA Pro Male / Female DIP Type	Q9303-PSS-013	A	
	Approved 核准	**Checked** 審核	**Prepared** 制作
			XS 06/11'26

1. SCOPE 適用範圍

This product specification defines the product performance and the test methods to ascertain the performance of the PwrSword® ULTRA Pro DIP Type 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設計生產的PwrSword® ULTRA Pro DIP Type Connector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
EN/ISO5961	Determination of total lead & cadmium content 總鉛和總鎘含量測定
EN1122	Determination of total lead & cadmium content 總鉛和總鎘含量測定
EN13346	Determination of heavy metals content 重金屬含量測定
EPA3052	Determination of total lead & cadmium content 總鉛和總鎘含量測定

3. FEATURE & DIMENSIONS 特征及尺寸

3.1. 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 參見圖面。

3.2. BILL OF MATERIAL 材料清單

Harmful material controlling follows the requirements of RoHS. The bill of material 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。

3.3. 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參見圖面。

3.4. 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。

3.5. RATING CURRENT, RATING VOLTAGE AND TR 額定電流,額定電壓及溫升

rating current: see **Table I**.

額定電流: 見**附表一**。

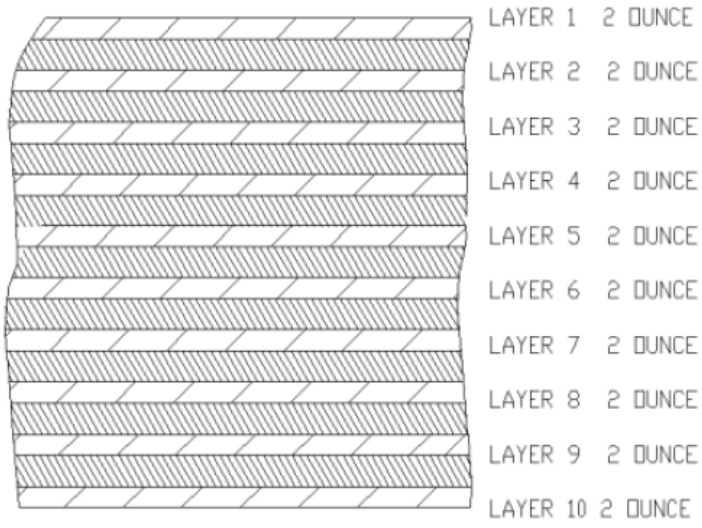
Table I - Current Rating

Types	Pitch (mm)	Single Contact	2Adjacent Contacts	4Adjacent Contacts	6Adjacent Contacts	8Adjacent Contacts	10Adjacent Contacts
High Power	9.35	140A	120A	100A	90A	85A	80A
Low Power	7.50	30A	25A	19A	17A	16A	NA

Types	Pitch (mm)	Single Contact	36 Adjacent Contacts
Signal Contact	2.00	3A	1A

NOTE: Connectors are applied to test boards with 10 layers x 2 ounces copper for power contact and 2 layers x 2 ounces copper for signal contact.

The 2 layers x 2 ounces copper for signal contact is mixed with Top &Bottom layers of Power contact.



rating voltage: see **Table 2**
額定電壓: 見**附表二**。

Table 2- rating voltage:

9303 Series Male/Female Dip/Press Fit Type						
Type	Contact Pitch	Pollution Degree(office Environment)	Material Group of PCB(Base on UL Rating)	MCD of PCB (mm)	Maximum Working Voltage (AC RMS)	Maximum Working Voltage (DC/AC Peak)
Signal	2.00	2	II	0.75	38	54
High Power	9.35			1.92	271	383
Low Power	7.50			1.92	271	383
Signal	2.00	2	IIIb	0.75	35	49
High Power	9.35			1.92	192	271
Low Power	7.50			1.92	192	271

3.6 STORAGE AND OPERATING TEMPERATURE 存貯與使用溫度

Temperature range: -40°C~+125°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~+125°C,包含接觸端子的額定電流溫升.
儲存溫度：0℃~+40℃，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. WAVE SOLDER 波峰焊接

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。

4.2.2 INFRARED REFLOW 紅外線回流焊接

Each cycle consists of three consecutive phases, as shown in **Table IV.**
每個焊接週期包括三個連續的階段，見附表四。

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准。

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 II**.
本產品設計符合**附表二**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.
除非特別注明，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

at least.

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，每組測試至少有5個樣品。

5.4. TEST SEQUENCE 測試順序

Product qualification test sequence as shown in **Table III.**

產品品質測試順序見**附表三**。

Table II: Test Requirements and Methods

附表二: 測試要求與方法

Items 項目	Requirements 要求	Test Methods 測試方法
1. Confirmation of Product 產品確認	Product shall be conforming to the requirements of applicable product drawing. 產品必須符合相關產品圖面的要求。	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	High Power pin: 0.7mΩ Max initial. Low Power pin: 1.5mΩ Max initial. Signal pin: 30.0mΩ Max initial. High Power pin 初始狀態 0.7mΩ Max Low Power pin 初始狀態 1.5mΩ Max Signal pin 初始狀態 30.0mΩ Max	Subject mated contacts assembled in housing to closed circuit of 20 mA 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 20 mA max,電壓 20 mV max。適用：EIA-364-23
3. Insulation Resistance 絕緣阻抗	Signal Pin:500 MΩ Min. Power Pin:1000 MΩ Min. Signal Pin:最小500 MΩ。 Power Pin:最小 1000 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	Signal Pin and Low Power pin must withstand test potential of 1000 VDC RMS for 1minute, current leakage must be 1mA Max. High Power pin must withstand test potential of 2500VDC for 1 minute, current leakage must be 1.0mA Max. Signal Pin和Low Power pin必須承受測試電壓1000 VDC RMS，時間1分鐘，漏電流不大於1 mA。 High Power pin 必須承受測試電壓 2500 VDC，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. Per 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/Un-mating) 耐久性	after testing. High Power Pin Resistance: 0.7mΩ Max. Low Power Pin Resistance: 1.5mΩ Max. Signal Pin Resistance: 30mΩ Max. 测試後： High Power Pin 接觸阻抗最大0.7mΩ。 Low Power Pin 接觸阻抗最大1.5mΩ。 Signal Pin 接觸阻抗最大30mΩ。	Repeat mate and unmated for connector200 cycles, at a speed of 127mm per minute. Per EIA-364-09 重復進行配合產品200次插拔，速度每分鐘127mm。適用：EIA-364-09
6. Contact Retention Force 端子保持力	Signal Pin: 13.4N/Pin. Min. Power Pin:13.4N/Pin. Min 信号端子：每支最小13.4N 电源端子：每支最小13.4N	Apply axial pull out (push) force at a speed of 25.4±3 mm/minute on the contact (Lock) assembled in the housing. Per EIA-364-29 以25.4±3mm/分鐘的速度施加軸向拉（推）力從塑膠本體上拔出(頂退)端子(耳扣)。 適用：EIA-364-29
7. Mating /Un-mating Force 插入力/拔出力	Mating force Signal Pin:1N / PIN Max. High Power Pin:12N/ PIN Max Low Power Pin:2N/PIN Max Un-mating force: Signal Pin:0.2N/ PIN Min High Power Pin:2.2N / PIN Min Low Power Pin:0.3N/ PIN Min 插入力 Signal Pin:每PIN最大1N. High Power Pin: 每PIN最大12N Low Power Pin: 每PIN最大2N 拔出力 Signal Pin: 每PIN最小0.2N High Power Pin: 每PIN最小2.2N Low Power Pin: 每 PIN 最小 0.3N	At a speed of 25.4±3 mm/minute, apply axial insert the mating part into fully or pull out from the subject product. Per EIA-364-13 以 25.4±3 mm/分鐘的速度，軸向完全插入對配插件到被測產品中或從被測產品中拔出。 適用：EIA-364-13
8. Vibration 機械振動	No electrical discontinuity greater than 1μs shall occur, Contact Resistance: Signal Pin:30mΩ Max High Power Pin: 0.7mΩ Max. Low Power Pin: 1.5mΩ Max. 不允許出現超過1μs 的瞬間斷開， 接觸阻抗: Signal Pin:最大30mΩ。 High Power Pin:最大 0.7mΩ。 Low Power Pin:最大 1.5mΩ。	Subject mated connector to 20-500 Hz traversed in 1 minute at 1.5 mm amplitude, 15 minute each of 3 mutually perpendicular plane, 10 mA potential applied. Per EIA-364-28. 對測試產品，在頻率變化每分鐘從20-500Hz,振幅 1.5 mm 條件下，在互相垂直的三個面上，每個面15分鐘下測量，電流10 mA。適用：EIA-364-28。

9.Thermal Shock 溫度沖擊	After testing, no damage, Contact Resistance :. Signal Pin:30mΩ Max High Power Pin: 0.7mΩ Max. Low Power Pin: 1.5mΩ Max. 測試後產品無損壞，接觸阻抗: Signal Pin:最大30mΩ。 High Power Pin:最大0.7mΩ。 Low Power Pin:最大1.5mΩ。	Temperature range from -40°C to +125°C. Start from -40°C, after 30 minutes, change to +125°C; change time is no more than 5 minutes, total 36 cycles. EIA-364-32. 溫度變化範圍： -40°C~ +125°C。從 -40°C 開 始，30 分鐘後換到+125°C，轉換時間不超過5 分鍾，共 36 個循環。適用：EIA-364-32
10. Mechanical Shock 機械沖擊	Electrical discontinuity less than 1μs. 电流瞬断时间小于1μs.	Accelerate Velocity: 50G; Waveform: Half-sine shock plus; Duration:11msec; 3drops each to normal and reversed directions of X,Y and Z axes; Per EIA-364-27 速度 50G; 半正弦波；持续 11 毫秒；±X, ±Y, ±Z,方向各 3 次;適用：EIA-364-TP-27。
11. Humidity-Temperature Cycle 溫濕度循環	After testing, no damage, Maximum Change: Signal Contact:30mΩ High Power Contact: 0.7mΩ. Low Power Contact: 1.5mΩ. Dielectric Strength should be OK, Power PIN Insulation Resistance should be 1000 MΩ Min, Signal PIN Insulation Resistance should be 500 MΩ Min. 測試後產品無損壞，信號 PIN 最大變化 30mΩ;High Power PIN 最大變化 0.7mΩ；LowPower PIN 最大變化 1.5mΩ；耐電壓測試 OK，Power PIN 絕緣阻抗最小 1000 MΩ, Signal PIN 絕緣阻抗最小 500 MΩ。	Subject product to 25~65°C, 94%.R.H 10Cycles, 24 hours/cycle, 240 hours total. Per EIA-364-31 產品置於 25~65°C,相對濕度:94%, 循環 10 次， 24 小時/次， 共 240 小時。適用：EIA-364-31
12. Test temperature rise for rating current 溫升測試	The test temperature rise above ambient shall not exceed 30°C. 測试溫度升高值不能超過 30°C. Ambient conditions - Still air 25°C. 周圍環境溫度 25°C。	Subject mated contacts assembled in housing to closed circuit of rating current see **Table I**. Per EIA-364-70 所述固定在外殼包的端子連結到一個封閉回路中測試，測試電流詳見附表一。適用：EIA-364-70

13. Salt Spray 鹽霧	After testing, no damage, Maximum Change: Signal Contact: 30mΩ ,High Power Contact: 0.7mΩ. Low Power Contact: 1.5mΩ.Dielectric Strength should be OK, I Power PIN Insulation Resistance should be 1000 MΩ Min, Signal PIN Insulation Resistance should be 500 MΩ Min. 測試後產品無損壞，信號 PIN 最大變化 30.0mΩ; High Power PIN 最大變化 0.7mΩ；Low Power PIN 最大變化 1.5mΩ；耐電壓測試 OK，Power PIN 絕緣阻抗最小 1000 MΩ, Signal PIN 絕緣阻抗最小 500 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°C。適用：EIA-364-26
14.High Temperature Life 高溫老化	After testing, no damage, Contact Resistance : Signal Pin:30mΩ Max High Power Pin: 0.7mΩ Max. Low Power Pin: 1.5mΩ Max. 測試後產品無損壞，接觸阻抗: Signal Pin:最大30mΩ。 High Power Pin:最大 0.7mΩ。 Low Power Pin:最大 1.5mΩ。	Subject product to 125±3°C for 504 hours continuously. Per EIA-364-17 產品置於 125±3°C 連續 504 小時。適用：EIA-364-17
15. 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

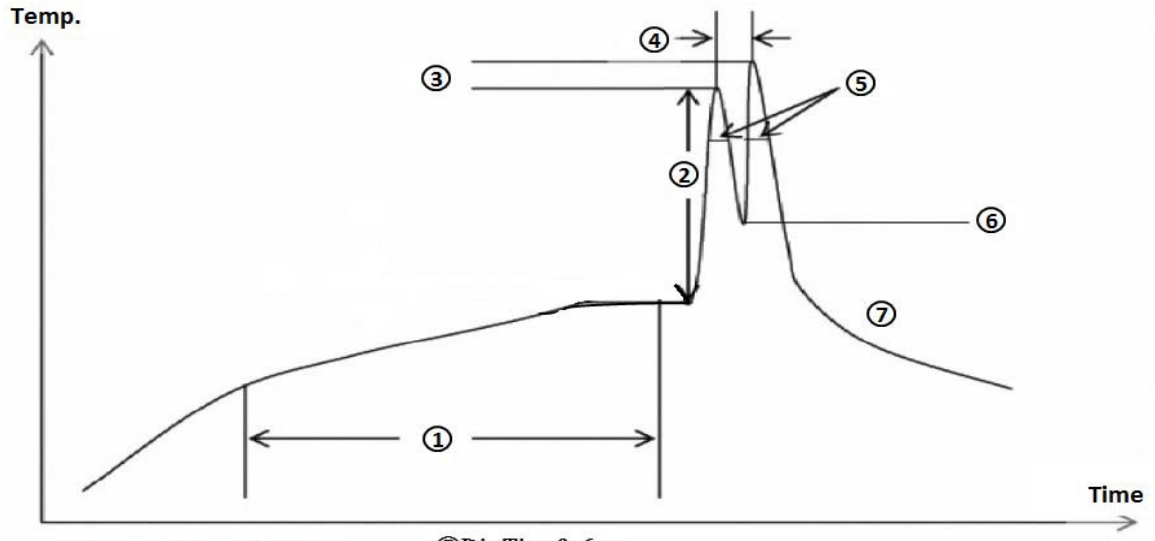
Table III: Product Qualification Test Sequence

附表三: 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	I	J
1. Conformation of Product 產品確認	1	1,6	1,9	1,9	1,9	1,9	1,9	1,9	1,9	1
2. Contact Resistance 接觸阻抗		2,5	2,6	2,6	2,6	2,6	2,6	2,6	2,6	
3. Insulation Resistance 絕緣阻抗			3,7	3,7	3,7	3,7	3,7	3,7	3,7	
4.Dielectric Withstanding Voltage 耐電壓			4,8	4,8	4,8	4,8	4,8	4,8	4,8	
5.Durability 耐久性		4								
6. Contact (lock) Retention Force 端子(耳扣)保持力	2									
7.Mating/Un-mating Force 插入/拔出力		3								
8. Vibration Sinusoidal Low Frequency 低頻正弦振動			5							
9 Thermal Shock 溫度衝擊				5						
10. Mechanical Shock 機械冲擊					5					
11. Humidity-Temperature Cycle 溫濕度循環						5				
12. Current rating 溫升測試							5			
13. Salt Spray 鹽霧								5		
14. High Temperature Life 高溫老化									5	
15. Solder-ability 可焊性										2

Table III: Wave Soldering Profile

附表三：波峰焊接曲線圖



① Preheat 80sec（1~2℃/s）
② ΔT<150℃
③235~265℃
④1~3sec
⑤Dip Time 3~6sec
⑥>200℃
⑦Cooling -5℃/s

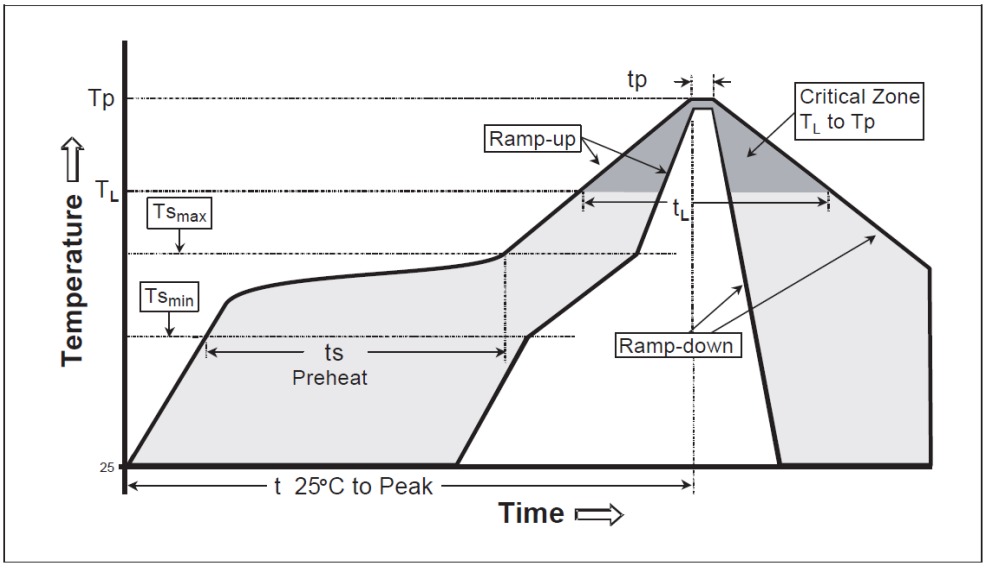
Table IV: Reflow Soldering Profile

附表四：回流焊接曲線圖

Lead-free reflow profile requirements:

無鉛回流焊接曲線

Paramete r	Reference 參考	Specifi cation
升溫區 Ramp-up	**25℃ ~150℃**	3℃/S Max
預熱區(Pre-heatimg) Temperature Min(Ts_{min}) Temperature Max(Ts_{max}) Time(Ts_{min} to ts_{max})	**150℃ ~200℃**	60~180sec
Time maintained above(保持时间) Temperature(TL) Time(tL)Reflow	**217℃**	60~150sec
Time within 5°C of actual peak Temperature(tp)	**260-/+5℃**	20~40sec
冷卻區 Cooling	**Peak Temp.~150℃**	-6℃/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。