

**PRODUCT SPECIFICATION**

**PS-7423**

Rev.  
**EX1**

**FOR REFERENCE ONLY**

**Title:** Power Connector Product Specification

**Part Number:** G87XX Series

**Description:** MINI POWER CONNECTOR

**Revisions Control**

Rev.	ECN Number	Originator	Approval	Issue Date
A	Initial Release	Daniel Hsieh	Roger Tsai	08-26-2009
B	NE-11118	Debby Hung	Arron Lin	08-25-2011
C	NE-12043	Debby Hung	Arron Lin	03-20-2012
D	NE-12081	Debby Hung	Arron Lin	05-29-2012
EX1		Debby Hung	Arron Lin	02-10-2014

**Product Specification Origination**

Originator:	Date:	Checked by:	Date:	Approved by:	Date:

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**PRODUCT SPECIFICATION****PS-7423**Rev.  
**EX1****1.0 GENERAL DESCRIPTION**

This specification covers the mechanical, electrical and environmental performances requirements and test methods for the 4.2mm pitch connector that included Wire to Wire and Wire to Board series.

**2.0 APPLICABLE DOCUMENTS (per latest revision on date of order)****Underwriters' Laboratories, Inc.**

UL-STD-94 Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.  
UL-STD-444 Communication Cables

**Federal**

QQ-B-626 Brass; bar, plate, rod, strip, flat wire and special shaped sections  
QQ-B-750 Bronze, phosphor; bar, plate, rod, sheet, strip, flat wire, and structural and special shaped sections.  
QQ-N-290 Plating, nickel (electrodeposited)

MIL-STD-1344A Test Methods For Electrical Connectors  
MIL-STD-202F Test methods for electronic and electrical component parts.  
EIA-364 Electrical connector/ socket test procedures including environmental classifications.  
MIL-G-45204 Gold plating (electrodeposited)  
MIL-P-81728 Plating; tin (electrodeposited)

**3.0 REQUIREMENTS****3.1 Material and Finish:**

- A) Insulator: high temperature thermoplastic, UL94V-0 / UL94V-2 rated.
- B) Contact: Copper Alloy
- C) Contact finish:
- D) Contact area: Gold Plated  
Termination area: Tin Plated  
Under-plated: Nickel Plated

**PRODUCT SPECIFICATION****PS-7423**Rev.  
**EX1**

**\*\*This product doesn't contain environmental hazardous materials per per Directive 2002/95/EC for RoHS or per SS-00259 for Sony GP.**

**3.2 Ratings of Connector**

- A) Rate Voltage: **500 V AC**  
B) Rate Current:

Current rating is 9A/per pin for single contact and the POS. in the table below is the series number under temp-rise testing

AWG. \ POS.	2 & 3	4 - 6	7 - 10	12 - 24
AWG#16	9	8	7	6
AWG#18	9	8	7	6
AWG#20	7	6	5	5
AWG#22	5	4	4	4
AWG#24	4	3	3	3
AWG#26	3	2	2	2
AWG#28	2	1	1	1

- C) Operating temperature: **-55°C to +105°C**  
D) Storage temperature: **-30°C to +80°C**

**3.3 Laboratory Approvals/Flammability:**

- A) Laboratory Approvals: Product shall be UL listed or recognized and CSA certified.  
B) Flammability: Plastic material used in the construction of this product shall be rated 94V-0 or 94V-2 , per UL-STD-94.

**3.4 Workmanship:**

Product shall be uniform in quality and be free from defects that adversely affect life, serviceability, performance, or appearance.

**3.5 Packaging and Shipping:**

Per Amphenol's Company Operating Procedure #COP-15-1 and Packing Specification PKS-0001

**4.0 PERFORMANCE AND TEST DESCRIPTION**

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Table I. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

**PRODUCT SPECIFICATION****PS-7423**Rev.  
**EX1****Table I - Test Requirements and Procedures Summary**

<b>Test Description</b>	<b>Requirements</b>	<b>Procedure</b>
• Examination of product	Meets requirements of product drawing.	<b>EIA 364-18</b> Visual, dimensional and functional compliance.
<b>ELECTRICAL</b>		
• Low level contact resistance	10 mΩ maximum	<b>EIA 364-23</b> Subject mated contacts assembled in housing to 20 mV maximum open circuit at 100 mA maximum. See figure 1.
• Insulation resistance	1000 MΩ minimum	<b>EIA 364-21</b> Apply 500V DC for 1 minute between adjacent pins or pin and ground.
• Dielectric withstanding voltage	NO Breakdown	<b>EIA 364-20</b> Apply 1500V AC for 1 minute between adjacent pins or pin and ground.
• Temperature rise	Temperature rise: +30°C Max.	<b>EIA 364-70</b> Measure the temperature rise at the rated current after 96 hours, during current cycling (45 minutes ON and 15 minutes OFF per hour) for 240 hours, and after final 96 hour steady state.
<b>MECHANICAL</b>		
• Insertion Force	15N Max. per pin	<b>EIA 364-13</b> Insert connectors at the speed rate of 25±6 mm / minute.
• Extraction Force	1.0N Min. per pin	<b>EIA 364-13</b> Extract connectors at the speed rate of 25±6 mm / minute.
• Contact Retention Force	4.5N Min.	Apply axial pull out force at 25±6 mm / minute on the assembly in the housing.
• Crimping Terminal Retention Force	30N Min.	Apply axial pull out force on the Terminal in the housing at a rate of 25±6 mm / minute .
• Vibration, random	Appearance No Damage  Discontinuity 1.0 microsec. MAX	Mate connector and subject to the following vibration conditions per EIA 364-28, test condition VII.

<b>Test Description</b>	<b>Requirements</b>	<b>Procedure</b>
• Durability	Contact Resistance ΔR=+10mΩ MAX.	Insertion and extraction are repeated 30 cycles with the connector at the speed rate of 10 cycles per minute.
• Mechanical Shock	Appearance	Mate connector and subject to the following

**PRODUCT SPECIFICATION**

**PS-7423**

Rev. **EX1**

	No Damage  Discontinuity 1.0 microsec. MAX	shock conditions. 3 shocks shall be applied along 3 mutually Test pulse : Half Sine Peak value: 490m / s2 Duration: 11ms
• Wire Pull out Force	AWG#16 88N Min. AWG#18 80N Min. AWG#20 59N Min. AWG#22 39N Min. AWG#24 29N Min. AWG#26 19N Min. AWG#29 9.8N Min.	Apply an axial pullout force on the wire at a rate of 25±6 mm / minute .
<b>ENVIRONMENTAL</b>		
• Temperature Life	Appearance No Damage  Contact Resistance ΔR=+10mΩ MAX.	<b>EIA 364-17</b> Mated connector, 105 ± 3°C, 96 hours.
• Thermal Shock	Appearance No Damage  Contact Resistance ΔR=+10mΩ MAX.	<b>EIA 364-32 Condition A</b> Mate connectors; expose to 10 cycles of: Temperature °C    Duration(Minutes) <b>-55 +0/-3            30</b> <b>+25 ±10                5 MAXIMUM</b> <b>+85 +3/-0             30</b> <b>+25 ±10                5 MAXIMUM</b>
• Humidity	Appearance No Damage  Contact Resistance ΔR=+10mΩ MAX.	<b>EIA 364-31 Method III Test Condition A.</b> Subject mated connectors to 168 hours (7 complete cycles)
• Solderability	Solder Wetting 95% of immersed area must show no voids, Pin holes.	Dip solder tails into the molten solder ( hold at 245 ± 5°C ) up to 0.5 mm from the tip of tails for 5 ± 0.5 sec.
• Slat Spray	Appearance No Damage  Contact Resistance ΔR=+10mΩ MAX.	Mate connector and exposed to the following salt mist conditions. Upon completion of the exposure period, salt deposits shall be removed by a gentle wash or dip in running water, after which the specified measurements shall be performed. NaCl concentration:            5 ± 1 % Spray time:                48 hours Ambient temperature: 35 ± 2°C

**PRODUCT SPECIFICATION**

**PS-7423**

Rev.

**EX1**

<ul style="list-style-type: none"> <li>Resistance to soldering heat</li> </ul>	No evidence of physical damage	EIA-364-56 Temperature(solder): 260±5°C Duration: 10±1 seconds (wave solder profile for Nylon (Figure 1))
		Test condition: Peak temperature: 260+0/-10°C Preheating temperature: 150 – 200 °C (reflow profile for LCP or high temperature thermal plastic (Figure 2))

**Recommended Wave Solder Profiles**

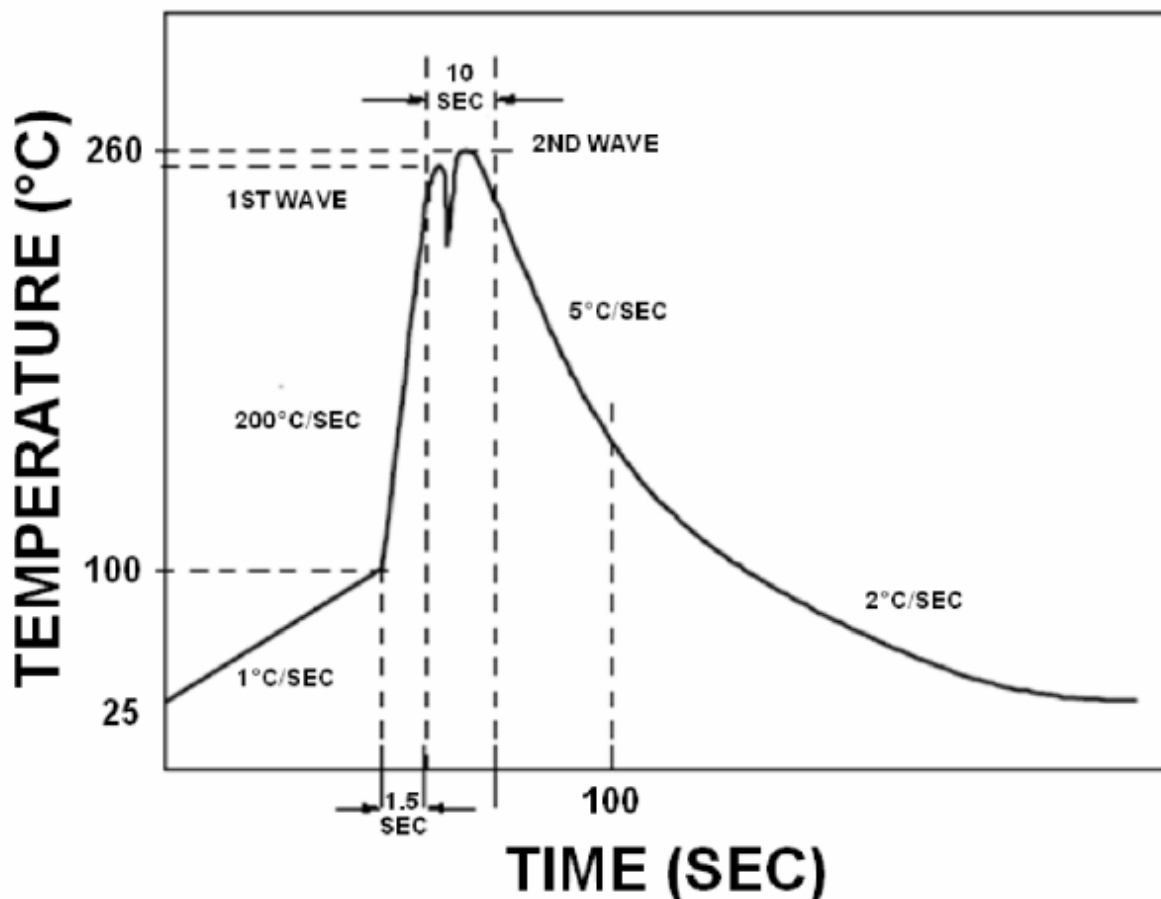
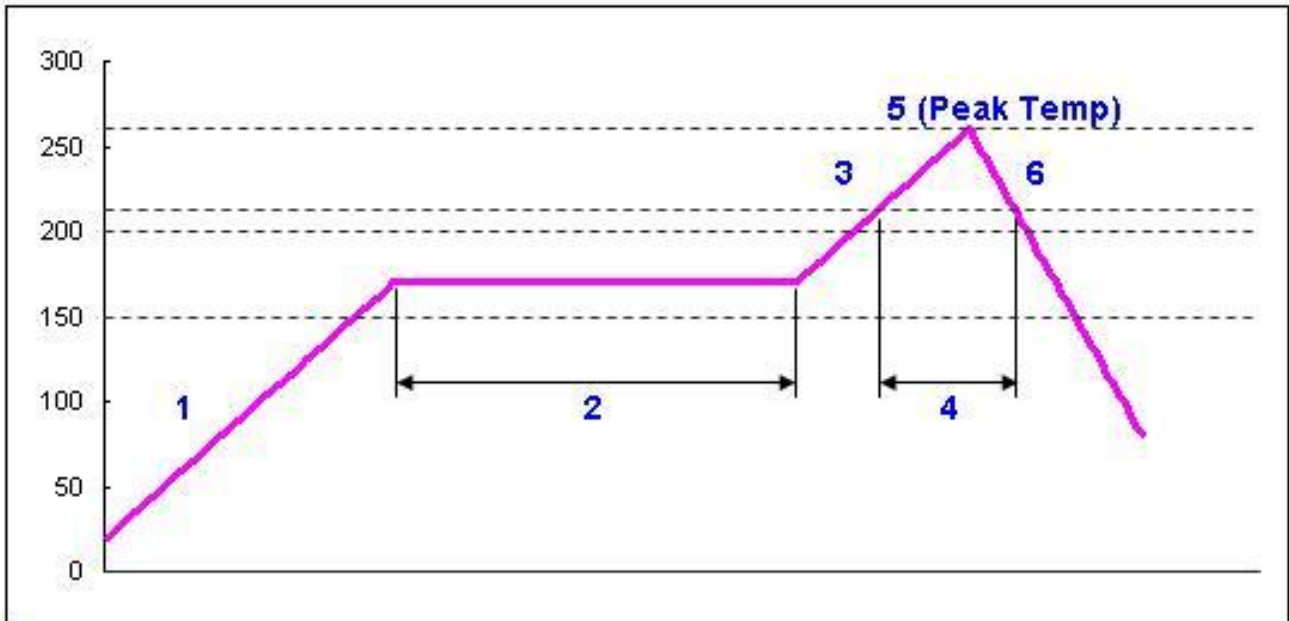


Figure 1. Recommended Wave Solder Profiles.

**PRODUCT SPECIFICATION**

**PS-7423**

Rev.  
**EX1**



<b>1</b>	Average ramp rate	3°C per second max.
<b>2</b>	Pre-heat temp.(minimum)	150°C
	Pre-heat temp.(maximum)	200°C
	Pre-heat time	60 to 120 seconds
<b>3</b>	Ramp to peak	3°C per second max.
<b>4</b>	Time over liquidus(217°C )	60 to 150 seconds
<b>5</b>	Peak temp.	260 +0/-10°C
	Time within 5°C of peak	10 seconds max.
<b>6</b>	Ramp- cool down	6°C per second max.
	Time 25°C to peak	8 minutes max.

Figure 2. Recommended IR Reflow Profiles.

**PRODUCT SPECIFICATION****PS-7423**Rev.  
**EX1****6.0 PRODUCT SHAPE, DIMENSIONS AND MATERIALS**

Dimensions, Materials, Platings and Markings should be refer to appropriate customer drawing.

**Table II - Product Qualification Test Sequence**

Test or Examination	Test Group (a)							
	A	B	C	D	E	F	G	H
SEQUENCE	Test Sequence (b)							
• Examination of connectors	1	1,11	1	1,5	1,3	1,3	1,3	1,
• Low Level Contact Resistance	2,6	2,6,8	2,4,6,8	2,4				
• Insulation Resistance		3,9						
• Dielectric Withstand Voltage		4,10						
• Pin Insertion Force ( Max )	3							
• Pin Extraction Force ( Min )	4							
• Contact Retention force ( Min )								2
• Crimping Terminal Retention Force (Min.)								3
• Durability	5							
• Mechanical Shock			7					
• Vibration			5					
• Latch Yield Strength								
• Wire Pull out force								4
• Temperature Life			3					
• Thermal Shock		5						
• Humidity		7						
• Temperature cycling								
• Slat Spray				3				
• Solderability						2		
• Temperature Rise					2			
• Resistance to soldering heat							2	
Sample Size	5	5	5	5	5	5	5	5