PRODUCT SPECIFICATION PS-7326 Rev. B1

ORIGINAL

Title: MINI SAS Connectors Product Specification

Part Number: G40 Series

Description: 0.80mm Pitch, Cable End and Board Mount

Revisions Control

Rev.	ECN Number	Originator	Approval	Issue Date
F	NE-09103	Sondra Sang	Hank Hsu	06.16.2009
A1	NE-09161	Sondra Sang	Hank Hsu	09. 28.2009
B1	NE-11151	Sondra Sang	Hank Hsu	10. 20. 2011

ISSUED BY AMPHENOL TAIWAN PDF Format D.C.

Product Specification Origination

Originator:	Date:	Checked by:	Date:	Approved by:	Date:
Sondra Sang	10/20/2011	Chenny Yeh	10/20/2011	Hank Hsu	10/20/2011

1. SCOPE

This document contains specific electrical and mechanical requirements for the 0.80 mm pitch, mini SAS cable and connector to insure functionality and reliability.

2. APPLICABLE DOCUMENT

2.1	EIA-364 Standard	Test methods for electrical connectors
2.2	UL-STD-94	Tests for flammability of plastic materials for parts in devices and appliances.
2.3	SFF-8086	Specification for Mini Multilane series: Common elements
2.4	SFF-8087	Specification for Mini Multilane series: Un-Shielded
2.5	SFF-8410	Specification for HSS Copper Testing And Performance Requirement

3. REQUIREMENT

3.1 DESIGN AND CONSTRUCTION

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2 Material and Finish

3.2.1 Housing

- High temperature thermoplastic, UL94V-0
- Color: Black

3.2.2 Contact

- Copper Alloy
- Contact area: Selective Gold plating
- Solder area: Tin plating
- Under-plating: Nickel plating

3.2.3 Shell

- Copper Alloy or Stainless steel
- Under-plating: Nickel plating (Stainless steel only)

3.3 Rating

- Current rating: 0.5A max
- Voltage rating: 30VAC
- Temperature: -20°C~ +85°C

4. Performance and testing

4.1 Test Requirement and Procedures Summary

Test Item		Requirement	Procedure
1	Examination of product	Meets requirements of drawing	EIA-364-18 Visual and dimensional inspection per product drawing.
Electrical:			
2	Low-level Contact Resistance	30 mΩ max. initially △R 20 mΩ max. after test	EIA-364-23 Mated to a compatible part, and measure by dry circuit at 20mV DC / 10mA max.
3	Dielectric Withstanding Voltage	No voltage breakdown	EIA-364-20 1. Test Voltage: 300 VDC between adjacent terminals. 2. Duration: 1 minute
4	Insulation Resistance	1000MΩ min.	EIA-364-21 Unmated to a compatible part 1. Test Voltage: 100 VDC between adjacent terminals. 2. Duration: 1 minute
5	Differential impedance	100 ± 15 ohm	EIA-364-108 Includes connector cable to connector interface and board termination pads and vias 1. Rise time: 70 ps (20~80%)
6	Within pair skew	5 ps max. (By design)	EIA-364-103
7	Near-End crosstalk	-26 dB (Frequencies up to 4.5GHz)	EIA 364-90
8	Insertion Loss	1.0 dB maximum (Frequencies up to 4.5 GHz)	EIA 364-101

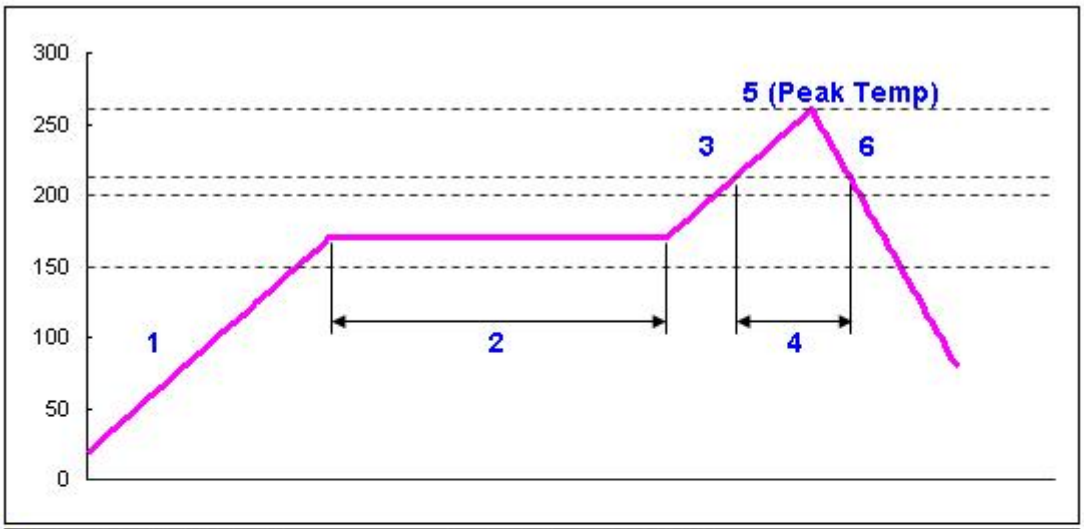
Test Item		Requirement	Procedure
Mechanical:			
9	Durability (Preconditioning)	No appearance damaged.	Connectors to be inspected for damage every 10 cycles. Failure Criteria-No evidence of physical damage. NO lubrication to be used during cycling. Cycling to be performed manually unless otherwise specified. Cycling rate – 500 cycles per hour.
10	Durability	No appearance damaged.	EIA-364-09 Cycling: 250 cycles Cycling rate: 10cycles/minute
11	Mating Force	55.5 N max.	EIA-364-13 Constant speed: 10 mm/minute
12	Un-mating Force	49.0 N max.	EIA-364-13 Constant speed: 10 mm/minute
13	Contact Normal Force	60 grams min.	EIA-364-04 Constant speed: 25 mm/minute
14	Vibration	No appearance damaged.	EIA 364-28 Test condition VII, condition D Subject mated specimens to 3.10 G's rms between 20-500 Hz for 15 minutes in each of 3 mutually perpendicular planes
15	Physical Shock	No appearance damaged.	EIA 364-27 Method H Subject mated specimens to 30 G half-sine shock pulses of 11 milliseconds duration.3 shocks in each direction applied along 3 mutually perpendicular planes,18 total shocks.

Test Item		Requirement	Procedure
16	Reseating	No appearance damaged.	The receptacle and plug test sample connector shall be manually plug/unplug for total of 3cycles. The test sample connector shall show no evidence of physical damage.
17	Terminal Retention Force	4 N MINIMUM	Axial pullout force on the Terminal in the housing at Rate of 25 mm (1 in) per min.
Environmental:			
18	Thermal Shock	No appearance damaged.	EIA 364-32C Condition I Mated to a compatible part 1. -55°C to +85°C 2. 30 minute dwell at each Temperature extreme. 3. Testing cycles 10
19	Humidity temperature cycling	No appearance damaged.	EIA-364-31 1. Humidity : 90%-95%. 2. Temperature Range 25°C to 65°C 3. Duration: 60 cycles (480hours)
20	Temperature Life (Preconditioning)	No appearance damaged.	The intent of this test is encompassed in the latest version of EIA-364-17. Testing should be performed per Method A, using table 9 for reference. Sample Size-Dependent upon current test group, refer to section 5.2 for specific sample sizes. Temperature and duration:105°C for 300 hrs.

Test Item		Requirement	Procedure
21	Temperature Life	No appearance damaged.	EIA-364-17 Method A, Test condition 2,Test Time Condition C Subject mated specimens to 70°C for 500 hours
22	Mixed Flowing Gas	No appearance damaged.	EIA 364-65 Class IIA Subject specimens to environmental Class IIA for 7 days unmated, and 7 days mated.
23	Thermal Disturbance (10Cycles)& Thermal cycling (500 Cycles)	No appearance damaged.	EIA 364-32 Cycle the connector between 15±3°C and 85±3°C, as measure on part. Ramps should be a minimum of 2°C per minute. And dwell times should insure that the contacts reach the temperature extremes (a minimum of 5 minutes). Humidity is not controlled. Perform 10 such cycles.
24	Dust	No appearance damaged.	EIA-364-91 (begin dust composition) Unmated
25	Solderability	95% of immersed area must show no volids or pin holes.	EIA-364-52 The surfaces to be tested shall be immersed in the flux for a minimum of 5 to 10 seconds. Any droplets of flux that may form shall be removed by blotting, taking care not to remove the flux coating from the surfaces to be tested. The test samples being tested shall be allowed to dry in ambient air for 5 to 20 seconds prior to solder immersion. The test sample termination shall be immersed to a depth equal to a length from its tip to a location normally not less than 0.5 mm below the connector seating

			plane. Temperature: 245±5℃ Duration: 4~5 seconds

4.2 Recommended IR Reflow Profile(Lead-free)



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

5.0 TEST PROCEDURE

Test or Examination		Test Groups							
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
1	Examination of product	1,9	1,9,12 ,17	1,10	1,14	1,12	1,11	1,5,10 ,13	
2	Low-level Contact Resistance	2,5,8	2,8,11 ,16	2,7,9	2,7,9, 11,13	2,7,9, 11	2,6,8, 10	2,7,9, 12	
3	Dielectric Withstanding Voltage		5,14						
4	Insulation Resistance		6,15						
5	Differential impedance								1
6	Within pair skew								1
7	Near-End Isolation								1
8	Insertion Loss								1
9	Durability (Preconditioning)	3	3	3	3	3	3		
10	Durability	4	4	4	4	4	4	4	
11	Mating Force							3	
12	Un-mating Force							6	
13	Contact Normal Force								1
14	Vibration			8				8	
15	Physical Shock							11	
16	Reseating	7	13		12	10	9		
17	Terminal Retention Force								1
18	Thermal Shock		7						
19	Humidity temperature cycling		10						
20	Temperature Life (Preconditioning)			5	5	5			
21	Temperature Life	6		6	6	6			
22	Mixed Flowing Gas				8				
23	Thermal Disturbance (10Cycles) &Thermal cycling (500 Cycles)				10	8	7		
24	Dust						5		

25	Solderability								1

Notes:

1. Test specimens: 5pcs/group

List of Appendix

- ☐ Product Drawing
- ☐ Qualification Test Report