PRODUCT SPECIFICATION **PS-7393** Rev. C

ORIGINAL

Title: HDMI Connector Product Specification

Part Number: G45A Series / HDMF1910 Series

Description: 19 PIN 0.5MM PITCH CONN

Revisions Control

Rev.	ECN Number	Originator	Approval	Issue Date
A	Initial Release	Daniel Hsieh	Hank Hsu	09. 02. 2008
B	NE-08320	Daniel Hsieh	Hank Hsu	09. 17. 2008
C	NE-13026	Chenny Yeh	Hank Hsu	02. 20. 2013

ISSUED BY AMPHENOL TAIWAN PDF Format D.C.

Product Specification Origination

Originator:	Date:	Checked by:	Date:	Approved by:	Date:
Chenny Yeh	2/20/2012	Sondra Sang	2/20/2012	Hank Hsu	2/20/2012

1. SCOPE

This document defines the detailed requirements for the Amphenol G45A / HDMF1910 Series 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.

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
- Thermoplastic, UL94V-0
- Color: Black

3.2.2 Contact
- Copper Alloy
- Contact area: Selective Gold plating
- Solder area: 100u" Tin plating
- Under-plating: 50u" Nickel overall

3.2.3 Shell
- Copper Alloy or Stainless steel
- Solder tail: 50u" Nickel overall

3.2.4 Shield (Optional)
- Copper Alloy or Stainless steel
- Solder tail: 50u" Nickel overall

3.3 Rating

- Current rating: 0.5A max
- Voltage rating: 40 V AC
- Operating Temperature: -20°C~ +85°C
- Storage 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	Initial Contact resistance excluding conductor resistance: 10 milliohms maximum. (Target design value) Shell: Initial Contact resistance 30 milliohms maximum.	EIA 364-23 Mated connectors, Contact: measured by dry circuit, 20 m Volts Max, and 10mA. Shell: measured by open circuit, 5 Volts Max 100mA.
3	Insulation Resistance	Unmated: 100MΩMin	EIA 364-21C Unmated connectors, apply 500 Volts DC between adjacent terminal and ground.
		Mated: 10MΩMin	Mated connectors, apply 150 Volts DC between adjacent terminal and ground.
4	Dielectric Withstanding Voltage	No Breakdown	EIA 364-20C Unmated connectors, apply 500 Volts AC(RMS.) between adjacent terminal and ground. Mated connector, apply 300 Volts AC (RMS.) between adjacent terminal and ground.
5	Contact Current Rating	0.5 A Min	EIA-364-70A 55 °C, Max ambient 85 °C, Max temperature change
6	Applied Voltage Rating	No Breakdown	40 Volts AC (RMS.) continuous Max, on any signal pin with respect to the shield.

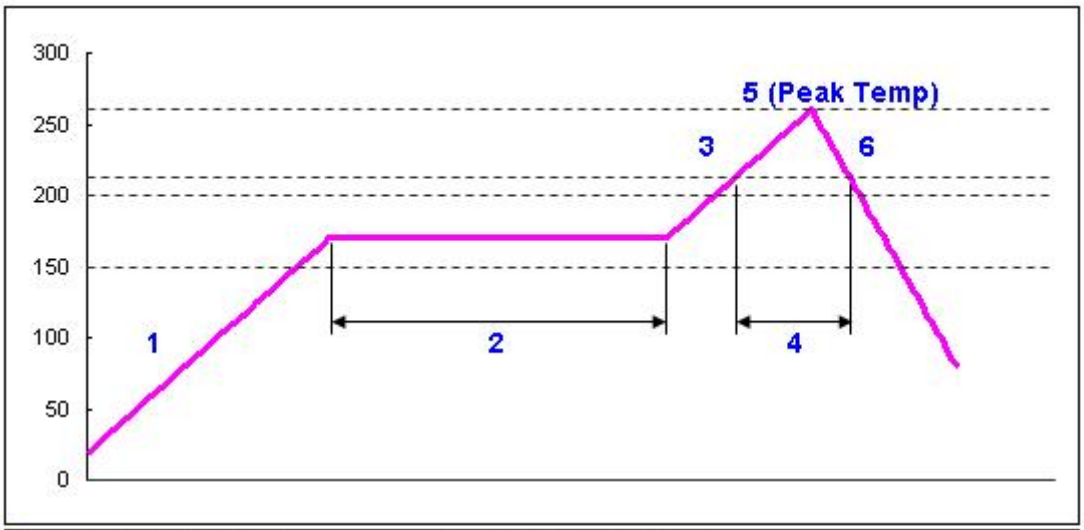
7	Electrostatic Discharge	No evidence of discharge to contacts at 8kVolts	Test unmated connectors from 1 kVolt to 8 kVolts in 1 kVolt steps using 8mm ball probe. IEC-801-2
8	TMDS Signals Time Domain Impedance	Connector Area: Type A: 100 ohms ±15% Type C: 100 ohms ±25%	EIA-364-108 Rise time≦ 200 sec(10%~90%) Signal to Ground pin ratio per HDMI designation.
		Transition Area: 100 ohms ±15%	Differential Measurement Specimen Environment Impedance=100 ohms differential
		Cable Area: 100 ohms ±10%	Source-side receptacle connector mounted on a controlled impedance PCB fixture.
9	TMDS Signals Time Domain Cross talk FEXT	Type A: 5% max. Type C: 10% max.	EIA-364-90 Rise time≦ 200 psec(10%~90%) Signal to Ground pin ratio per HDMI designation. Differential Measurement Specimen Environment Impedance=100 ohms differential Source-side receptacle connector mounted on a controlled impedance PCB fixture. Driven pair and victim pair.
Mechanical:			
10	Vibration	Appearance No Damage Contact Resistance Contact : Change from initial value: 30 mΩ maximum. Shell : Change from initial value: 50 mΩ maximum. Discontinuity 1 μs maximum.	EIA-364-28 Condition III Amplitude: 1.52 mm P-P or 147 m/s^2{15G} Sweep time: 50-2000-50Hz in 20 minutes. Duration: 12 times in each of X, Y, Z axes (Total of 36 times) Electrical load: DC 100 mA current must be conducted during the test.

11	Durability	Contact Resistance Contact : Change from initial value: 30 mΩ Max. Shell : Change from initial value: 50 mΩ Max.	EIA 364-09 Measure contact and shell resistance after the following. Automatic cycling : Type A:10,000 cycles at 100 ± 50 cycles per hour Type C:5,000 cycles at 100 ± 50 cycles per hour
12	Insertion Force	44.1 N {4.5kgf} Max	EIA 364-13 Insertion and withdrawal speed: 25 mm / Min.
13	Withdrawal Force	Type A: 9.8 N {1.0kgf} Min 39.2 N {4.0kgf} Max Type C: 7 N Min 25 N Max	EIA 364-13 Insertion and withdrawal speed: 25 mm / minute.
14	Terminal Force	3.92N {0.4kgf}Min	EIA 364-29 Assembled in the housing at a rate of 25±3 mm/minute
Environmental:			
15	Solderability	Soldering Wetting : 95%of immersed area must show no voids, pin holes.	EIA 364-52 or MIL-STD-202F-208F Dip solder tails into the molten solder (held at 245±5℃) up to 1.2mm from the bottom of housing for 2~3 seconds.
16	Humidity	Appearance No Damage Contact Resistance Contact : Change from initial value: 30 mΩ Max. Shell : Change from initial value: 50 mΩ Max. Appearance No Damage Conform to item of	EIA 364-31B A) Mate connectors together and perform the test as Temperature : +25 to +85°C Relative Humidity : 80 to 95% Duration : 4 cycles (96 hours) Upon completion of the test, specimens must be conditioned at ambient room conditions for 24 hours, after which the specified measurements must be performed. EIA 364-31B B) Unmate connectors and perform the test as follows: Temperature : +25 to +85°C

		Dielectric Withstanding Voltage and Insulation Resistance	Relative Humidity : 80 to 95% Duration : 4 cycles (96 hours) Upon completion of the test, specimens must be conditioned at ambient room conditions for 24 hours, after which the specified measurements must be performed.
17	Thermal shock	Appearance No Damage Contact Resistance Contact : Change from initial value: 30 mΩ Max. Shell : Change from initial value: 50 mΩ Max.	EIA 364-32C,Condition I 10 cycles of: a) -55°Cfor 30 minutes b) +85°C for 30 minutes
18	Thermal Aging	Appearance No Damage Contact Resistance Contact : Change from initial value: 30 mΩ Max. Shell : Change from initial value: 50 mΩ Max.	EIA-364-17B, Condition 4, Method A Mate connectors and expose to (+105 ± 2)°C for 250 hours. Upon completion of the exposure period, the test specimens must be conditioned at ambient room conditions for one to 2 hours after which the specified measurements must be performed.
19	Physical shock	Appearance No Damage Contact Resistance Contact : change from initial value: 30 mΩ Max Shell : change from initial value: 50 mΩ Max Discontinuity 1 μs maximum.	EIA 364-27,Condition A Pulse width: 11 msec Wave form: half sine, 490 m/s^2 {50g's}, 3 strokes in each X, Y, Z axes. (total 18 shocks)

20	Salt Spray	Appearance No Damage Contact Resistance : change from initial value: 30 mΩ Max	EIA 364-26 Subject test samples to a salt water spray having a concentration of 5% for 48 hours at a temperature of 35°C.Measure resistane before and after salt spray exposure
21	Resistance to soldering heat	Appearance No Damage	1.Wave/DIP test a. Solder temperature: 260+0/-10°C b. Duration time:10sec 2.Soldering iron test a. Solder temperature:380±5°C b. Duration time:5sec

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	I
1	Examination of product	1,12	1,6	1,10	1,7	1,5	1,3	1	1	1,3
2	Low Level Contact Resistance	2,11	2,5	2,9	2,6	2,4		2		
3	Insulation Resistance	3,10		3,8				3		
4	Dielectric Withstanding	4,9		4,7				4		
5	Contact current rating				5					
6	Applied Voltage Rating				4					
7	Electrostatic Discharge	5								
8	TMDS Signals Time Domain Impedance							5		
9	TMDS Signals Time Domain Cross talk FEXT							6		
10	Vibration		3							
11	Durability	8								
12	Insertion force	6								
13	Withdrawal force	7								
14	Terminal Force								2	
15	Solderability						2			
16	Humidity			6						
17	Thermal shock			5						
18	Thermal Aging				3					
19	Physical shock		4							
20	Salt Spray					3				
21	Resistance to soldering heat									2
	Sample Quantity	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)

List of Appendix

□ Product Drawing

□ Qualification Test Report