Qualification Test Report

501-115008 Rev. A

Product Specification: 108-60086

Reference Test Report No.: TR60175-I

Date: 28JAN2010

Classification: Unrestricted

LTR	REVISION RECORD	DR	DATE
A	Released	A.H	28JAN'10

DIST

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1. Introduction

1.1 Objective

Testing was performed on the V-HDMI RECEPTACLE CONNECTOR to determine if it meets the requirements of Product Specification, 108-60086, Rev.A1.

1.2 Scope

This report covers the electrical, mechanical and environmental performance requirements of the V-HDMI RECEPTACLE CONNECTOR.
The qualification testing was performed between DEC. 2009 and JAN. 2010.

1.3 Conclusion

The V-HDMI RECEPTACLE CONNECTOR meets the electrical, mechanical and environmental performance requirements of Product Specification, 108-60086.

1.4 Test Samples

The following samples were used:

Part Number	Description
☐-1932244-☐	V-HDMI 19 POS RECEPTACLE ASSY DIP TYPE
☐-1932249-☐	V-HDMI 19 POS RECEPTACLE ASSY DIP TYPE

Fig. 1

2. Test Contents

No.	Test Items	Requirements	Judgment
2.1	Examination of Product	Visual Inspection No physical damage	Acceptable
		Electrical Requirements	
2.2	Termination Resistance (Low Level)	Contact Initial: 50 mΩ Max. Final: Δ30 mΩ Max Shell Initial: 50 mΩ Max. Final: Δ50 mΩ Max.	Acceptable
2.3	Dielectric withstanding voltage	Initial/Final; Unmated connector: 500V AC Mated connector: 300V AC 1minute, No breakdown allowed. Current leakage: 0.5mA Max	Acceptable
2.4	Insulation Resistance	Initial/Final; 100MΩ minimum(Unmated) 10MΩ minimum(mated) Unmated connectors: apply 500V DC Mated connector: apply 150V DC	Acceptable
2.5	Temperature Rising	Measure temperature rising by energized current. 30℃ Max. under loaded specified current(0.5A)	Acceptable
2.6	Electrical Discharge	Test unmated each connector from 1KV to 8KV in 1KV steps using 8mm ball prove. No evidence of discharge to contact at 8 KV	Acceptable
		Mechanical Requirements	
2.7	Insertion Force	44.1N (4.5Kgf) Max. Operation Speed: 25mm/min.	Acceptable
2.8	Withdrawal Force	9.8N (1.0Kgf) Min. 39.2N (4.0Kgf) Max. Operation Speed: 25mm/min.	Acceptable

Fig. 2

(To be continued)

No.	Test Items	Requirements	Judgment
2.9	Durability(Repeated Mate/Unmating)	No. of cycles: 10000 cycles Operation speed: 100±50 cycle/hour Contact: Δ30mΩ maximum(Final) Shell: Δ50mΩ maximum(Final)	Acceptable
2.10	Vibration (High Frequency)	Sweep time: 50~2000~50 Hz/20 minutes, Amplitude: 1.52mm(P-P) or 147m/s^2(15G) Duration: 12times in each (total of 36 times) X,Y,Z axes. 100mA applied. No electrical discontinuity greater than 1μsec shall occur. Contact: ΔR30mΩ maximum (Final) Shell: ΔR50mΩ maximum (Final)	Acceptable
2.11	Physical Shock	Duration: 11msec Waveform: Half sine 490m/s2(50G), 3 strikes in each X, Y, Z axes. No electrical discontinuity greater than 1sec allowed. Contact: ΔR30mΩ maximum(final) Shell: ΔR50mΩ maximum(Final)	Acceptable
Environmental Requirements			
2.12	Solderability	Solder temperature: 230±2℃ Immersion duration : 3±0.5seconds Flux : Alpha 100 Wet solder coverage : 95% Min	Acceptable
2.13	Thermal Shock	-55℃/30min., +85℃/30min. Making this a cycle, repeat 10 cycles. Contact: ΔR30mΩ maximum (Final) Shell: ΔR50mΩ maximum (Final)	Acceptable

Fig. 2

(To be continued)

No.	Test Items	Requirements	Judgement
2.14	Humidity	Temperature: +25~+85℃ Relative humidity: 80~95% R.H Duration: 4cycles(96 hours) ANSI/EIA-364-31 MethodⅢ Contact: ΔR30mΩ maximum(Final) Shell: ΔR50mΩ maximum(Final) Dielectric Withstanding Voltage: No creeping discharge or flashover; current leakage: 0.5mA Max Insulation Resistance: 10MΩ	Acceptable
2.15	Thermal aging	105℃, 250 hours Contact: ΔR30mΩ maximum(Final) Shell: ΔR50mΩ maximum(Final)	Acceptable
2.16	Resistance to soldering heat	Temperature: 380±5℃ for 3±1s No Physical damage occur	Acceptable
2.17	Resistance to Reflow Soldering Heat	Pre-heat 150~180℃: 60~120s Heat 230℃ minimum: 30~40s Reflow times: 2times Test connector on PCB No physical damage shall occur.	Acceptable
2.18	Salt spray	Concentration: 5% Temperature: 35℃ Duration: 3cycles(24hours) No corrosion that damages function Contact: ΔR30mΩ maximum (Final) Shell: ΔR50mΩ maximum (Final)	Acceptable

Fig. 2 (End)

3. Product Qualification Test Sequence

Test or examination	TEST – GROUP (a)												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Examination of product	1,9	1,11	1,7	1,8	1,5	1,5	1,3	1,3	1,5	1,3	1,3	1,3	1,5
Termination resistance	2,4,6,8	2,4,6,8,10	2,4,6		2,4	2,4			2,4				2,4
Dielectric withstanding voltage				2,4									
Insulation Resistance				5,7									
Temperature Rising					3								
Electrical Discharge						3							
Insertion Force							2						
Withdrawal Force								2					
Durability(100cycles)		3											
Durability(10000cycles)									3				
Vibration			3										
Physical Shock			5										
Solderability										2			
Thermal Shock	3	5		3									
Humidity	7	9		6									
Thermal aging	5	7											
Resistance to soldering heat											2		
Resistance to Reflow Soldering Heat												2	
Salt spray													3

(a) Numbers indicate sequence in which the tests are performed.

4. Test Results

Conditions	Test Item	N	Unit	Test Result			Spec.	Judge-ment
				Max	Min	Ave		
Group 1								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Termination resistance Contact	95	mΩ	38.56	23.64	27.97	50 mΩ Max	Pass
	Termination resistance Shell	5	mΩ	2.65	1.96	2.21	50 mΩ Max	Pass
After thermal shock	ΔR Contact	95	Δ mΩ	6.41	-8.86	0.32	30 mΩ Max	Pass
	ΔR Shell	5	Δ mΩ	0.11	-0.55	-0.21	50 mΩ Max	Pass
After thermal aging	ΔR Contact	95	Δ mΩ	5.5	-6.65	0.92	30 mΩ Max	Pass
	ΔR Shell	5	Δ mΩ	0.33	-0.01	0.16	50 mΩ Max	Pass
After humidity	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	ΔR Contact	95	Δ mΩ	6.4	-6.56	0.11	30 mΩ Max	Pass
	ΔR Shell	5	Δ mΩ	1.09	-0.29	0.33	50 mΩ Max	Pass

Conditions	Test Item	N	Unit	Test Result			Spec.	Judge-ment
				Max	Min	Ave		
Group 2								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Termination resistance Contact	95	mΩ	36.47	23.26	27.80	50 mΩ Max	Pass
	Termination resistance Shell	5	mΩ	2.65	2.1	2.38	50 mΩ Max	Pass
After Durability (100cycles)	Δ R Contact	95	Δ mΩ	10.44	-5.80	-0.17	30 mΩ Max	Pass
	Δ R Shell	5	Δ mΩ	1.16	-0.05	0.29	50 mΩ Max	Pass
After thermal shock	Δ R Contact	95	Δ mΩ	6.49	-4.81	0.55	30 mΩ Max	Pass
	Δ R Shell	5	Δ mΩ	1.99	-0.17	0.36	50 mΩ Max	Pass
After thermal aging	Δ R Contact	95	Δ mΩ	13.18	-6.36	1.42	30 mΩ Max	Pass
	Δ R Shell	5	Δ mΩ	2.98	0.04	0.94	50 mΩ Max	Pass
After humidity	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Δ R Contact	95	Δ mΩ	5.46	-7.62	0.11	30 mΩ Max	Pass
	Δ R Shell	5	Δ mΩ	2.80	0.22	0.95	50 mΩ Max	Pass

Conditions	Test Item	N	Unit	Test Result			Spec.	Judge-ment
				Max	Min	Ave		
Group 3								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Termination resistance Contact	95	mΩ	29.83	25.61	27.61	50 mΩ Max	Pass
	Termination resistance Shell	5	mΩ	2.26	1.68	2.04	50 mΩ Max	Pass
During vibration testing	Discontinuity	95	–	No discontinuity			1us Max	Pass
After vibration	ΔR Contact	95	Δ mΩ	1.24	-3.28	-2.49	30 mΩ Max	Pass
	ΔR Shell	5	Δ mΩ	0.73	0.05	0.35	50 mΩ Max	Pass
During physical shock testing	Discontinuity	95	-	No discontinuity			1us Max	Pass
After physical shock	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	ΔR Contact	95	Δ mΩ	2.22	-2.48	0.21	30 mΩ Max	Pass
	ΔR Shell	5	Δ mΩ	0.64	-0.15	0.10	50 mΩ Max	Pass
Group 4								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Dielectric strength	30	-	No creeping discharge or flashover			No abnormalities	Pass
After thermal shock	Dielectric strength	30	-	No creeping discharge or flashover			No abnormalities	Pass
	Insulation resistance	30	Ω	$3.64x10^{14}$	$2.60x10^{12}$	$2.69x10^{13}$	10MΩ Min	Pass
After humidity	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Insulation resistance	30	Ω	$1.40X10^{15}$	$6.35X10^{12}$	$1.57X10^{14}$	10MΩ Min	Pass

Conditions	Test Item	N	Unit	Test Result			Spec.	Judge-ment
				Max	Min	Ave		
Group 5								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Termination resistance Contact	95	mΩ	30.67	23.76	27.61	50 mΩ Max	Pass
	Termination resistance Shell	5	mΩ	1.68	0.98	6.21	50 mΩ Max	Pass
During Temperature rising testing	Temperature (DC 0.5A)	5	℃	7.70	1.70	5.82	30℃ Max	Pass
After temperature rising	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	ΔR Contact	95	Δ mΩ	4.35	-4.20	0.42	30 mΩ Max	Pass
	ΔR Shell	5	Δ mΩ	1.19	-0.14	2.3	50 mΩ Max	Pass
Group 6								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Termination resistance Contact	95	mΩ	30.90	24.26	27.58	50 mΩ Max	Pass
	Termination resistance Shell	5	mΩ	2.21	1.16	1.85	50 mΩ Max	Pass
During Electrical discharge testing	-	5	-	No signs of discharge to the signal contacts			No abnormalities	Pass
After Electrical discharge	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	ΔR Contact	95	Δ mΩ	6.10	-1.51	1.29	30 mΩ Max	Pass
	ΔR Shell	5	Δ mΩ	1.19	-0.14	0.38	50 mΩ Max	Pass

Conditions	Test Item	N	Unit	Test Result			Spec.	Judge-ment
				Max	Min	Ave		
Group 7								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
After insertion	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Insertion force	5	N	9.38	8.63	8.98	44.1N Max	Pass
Group 8								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
After withdrawal	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Withdrawal force	5	N	12.69	11.67	12.08	9.8N Min 39.2N Max	Pass
Group 9								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Termination resistance Contact	95	mΩ	36.74	24.78	27.80	50 mΩ Max	Pass
	Termination resistance Shell	5	mΩ	3.64	2.03	2.49	50 mΩ Max	Pass
After durability(10000cycles)	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Δ R Contact	95	Δ mΩ	25.32	-9.57	0.56	30 mΩ Max	Pass
	Δ R Shell	5	Δ mΩ	0.87	0.08	0.51	50 mΩ Max	Pass
Group 10								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
After soldering	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Appearance	5	-	Solderable area had a minimum of 95% solder coverage			95% Min	Pass

Conditions	Test Item	N	Unit	Test Result			Spec.	Judge-ment
				Max	Min	Ave		
Group11								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
After resistance to soldering heat	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Appearance	5	-	No deformation or fusion of housing and no physical damage			No abnormalities	Pass
Group 12								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
After reflow	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Appearance	5	-	No deformation or fusion of housing and no physical damage			No abnormalities	Pass
Group 13								
Initial	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Termination resistance Contact	95	mΩ	35.95	22.50	27.49	50 mΩ Max	Pass
	Termination resistance Shell	5	mΩ	2.65	1.96	2.68	50 mΩ Max	Pass
After salt spray	Examination of product	5	-	No abnormalities			No abnormalities	Pass
	Δ R Contact	95	Δ mΩ	8.86	-6.82	-0.03	30 mΩ Max	Pass
	Δ R Shell	5	Δ mΩ	2.70	1.43	2.12	50 mΩ Max	Pass