

Flag HDMI Connector

1. SCOPE

1.1. Contents

This specification covers the performance, tests and quality requirements for the Tyco Electronics Flag type HDMI connector.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENT

The following Tyco documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. Tyco Electronics Documents

- 109-202: Condition B, Component Heat Resistance to Lead-Free Wave Soldering.
- 501- 60056: Qualification Test Report.

2.2. Commercial Standard

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications.
- JESD22-B102D: Solderability Test Method.

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3. Ratings

- A. Voltage: 40 Volts AC.
- B. Current: 0.5 Amperes.
- C. Temperature: -20 to 85 °C.

3.4. Performance Requirement and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per EIA-364.

DR	DATE	APVD	DATE
Francis Lee	05JUNE09	Steven Yao	05JUNE09

Test Requirements and Procedures Summary

Item	Test Description	Requirement	Procedure
3.4.1	Examination of product.	Meets requirements of product drawing.	EIA-364-18 Visual dimensional and functional per applicable quality inspection plan.
ELECTRICAL			
3.4.2	Low level contact resistance.	Initial: Terminal & Shell: 50 mΩ max. After test : (Change from initial value) Terminal: 30 mΩ max. Shell: 50 mΩ max.	EIA-364-23C Terminal: measure by dry circuit, 20 mV maximum, 10 mA. EIA-364-06B Shell: measure by open circuit, 5 V maximum, 100 mA.
3.4.3	Dielectric withstanding voltage.	1 minute hold with no breakdown or flashover. Leakage current : 0.50 mA max.	EIA-364-20C, Method A Unmated: Test between adjacent contacts or ground. Voltage: 500 VAC. Mated: Test between adjacent contacts and ground. Voltage: 300 VAC.
3.4.4	Electrostatic Discharge	No evidence of Discharge to Contact at 8kVolts	EN61000-4-2 Test unmated each connector from 1kVolts to 8kVolts in 1kVolts steps using 8mm ball probe.
3.4.5	Insulation resistance	100 megaohm min.(unmated); 10 megaohm min. (mated)	ANSI/EIA 364-21C Unmated connectors: apply 500Volts DC for 1minute between adjacent terminal or ground; Mated connectors: apply 150Volts DC for 1minute between adjacent terminal or ground;
3.4.6	Contact Current Rating	0.5 A min.	ANSI/EIA 364-70B Initial ambient temperature: 55°C Max. After temperature change: 85°C Max.
3.4.7	Applied voltage rating.	No breakdown.	40 VAC (RMS.) continuous maximum, on any signal pin with respect to the shield.
3.4.8	TMDS Signal Time Domain Impedance	Rise Time \leq 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 (ANSI/EIA-364-108)	Connector Area: Type A: 100 \pm 15% Transition Area: 100 ohms \pm 15% Cable Area: 100 ohms \pm 10%

Figure1 (continued)

3.4.9	TMD5 Signals Time Domain Cross talk (FEXT)	Rise Time \leq 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. (ANSI/EIA-364-90)	Type A: 5% maximum
MECHANICAL			
3.4.10	Insertion force	4.5 kgf (44.1 N) max.	EIA-364-13D, Method A Measure force necessary to mate the connector assemblies at a max of 25 mm/minute.
3.4.11	Withdrawal force	4 kgf (39.2 N) max. 1 kgf (9.8 N) min.	EIA-364-13D, Method A Measure force necessary to unmate the connector assemblies at a max of 25 mm/minute.
3.4.12	Durability	Contact resistance for all condition after test: (Change from initial value) Contact: 30 m Ω maximum, Shell: 50 m Ω maximum. Condition A: 50 cycles Condition B: 100 cycles Condition C: 10000 cycles	EIA-364-09C Mate and unmated connector assemblies for cycles at a maximum rate of 100 cycles/hour.
3.4.13	Mechanical shock.	Appearance: confirm to item 3.4.1; No discontinuities of 1 μ s or longer duration. Contact Resistance after test: (Change from initial value) Contact: 30 m Ω maximum, Shell: 50 m Ω maximum.	EIA-364-27 test condition A Subject mated connectors to 50g's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along three mutually perpendicular planes
3.4.14	Mechanical Vibration.	Appearance: confirm to item 3.4.1; No discontinuities of 1 μ s or longer duration. Contact Resistance after test: (Change from initial value) Contact: 30 m Ω maximum, Shell: 50 m Ω maximum.	EIA-364-28E Test Condition III Accelerate: 15G Sweep time: 50-2000-50 Hz in 20 min. Duration: 12 times in each of three mutually perpendicular planes.

Figure1 (continued)

ENVIRONMENTAL			
3.4.15	Thermal shock.	Appearance: confirm to item 3.4.1; Contact Resistance after test: (Change from initial value) Contact: 30 mΩ maximum, Shell: 50 mΩ maximum.	EIA-364-32C Test condition I Subject mated connectors to 10 cycles (half hour/cycle) between -55°C and 85°C.
3.4.16	Thermal aging	Appearance: confirm to item 3.4.1; Contact Resistance after test: (Change from initial value) Contact: 30 mΩ maximum, Shell: 50 mΩ maximum.	ANSI/EIA-364-17B, Condition 4, Method A Mated connector to $105 \pm 2^\circ\text{C}$, 250h Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2h, after which the specified measurements shall be performed.
3.4.17	Humidity.	Condition A; Appearance: confirm to item 3.4.1; Contact Resistance after test: (Change from initial value) Contact: 30 mΩ maximum, Shell: 50 mΩ maximum. Condition B; Appearance: confirm to item 3.4.1; Dielectric Withstanding Voltage: confirm to item 3.4.3 Insulation resistance: confirm to item 3.4.5	ANSI/EIA-364-31B Method III A; Mated connector B; Unmated connector $+25 \sim +85^\circ\text{C}$, 80 to 95%RH, 4 cycles (96h) Upon completion of the test, specimens shall be conditioned at ambient room conditions for 24h, after which the specified measurements shall be performed.
3.4.18	Solderability.	The inspected area of each Lead must have 95% solder coverage minimum.	JESD22-B102D, Condition C; Steam aging preconditioning: $93 \pm 3/-5^\circ\text{C}$, 8 hours ± 15 min. solder temperature: $240 \pm 5^\circ\text{C}$ solder time: 5~10 s.
3.4.19	Resistance to wave soldering heat.	See note	Tyco spec.: 109-202, Condition B. Solder temp.: $265 \pm 5^\circ\text{C}$, 10+2/-0 sec.

NOTE Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.

Figure 1 (End)

3.5. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group									
	A	B	C	D	E	F	G	H	I	J
	Test Sequence (a)									
Examination of product.	1,13	1,7	1,8	1,3	1,9	1,5	1,4	1,3	1,3	
Low level contact resistance. (terminals and shell)	2,4,6,8,10	2,4,6			3,7					
Dielectric withstanding voltage.	12		2,4,			2				
Electrostatic Discharge				2						
Insulation resistance	11		,57			3				
Contact Current Rating							2			
Applied voltage rating.						4	3			
Insertion force					2,6					
Withdrawal Force					4,8					
Durability (100cycles)	3(b)									
Durability (10000cycles)					5					
Mechanical shock.		5								
Mechanical Vibration.		3								
Thermal shock.	5,		3							
Thermal aging	7									
Humidity.(condition B)	9									
Humidity.(condition A)			6							
Solderability.								2		
Resistance to wave soldering heat.									2	
Time Domain Impedance										1
Crosstalk (FEXT)										2

NOTE (a) Numbers indicate sequence in which test are performed.

(b) 100 cycles durability performed on ½ of the samples.

Figure 2