AdrenaLINE Slingshot Connectors

1. SCOPE

1.1. Content

This specification defines performance, tests and quality requirements for 224G AdrenaLINE Slingshot Connector Assemblies.

1.2. Qualification Testing

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using applicable inspection plan and product drawings. Each test sequence shall be populated with 22 samples for qualification testing.

2. APPLICABLE DOCUMENTS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, 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 a conflict between the requirements of this specification and the referenced documents, the specification shall take precedence.

2.1. TE Documents

- 114-161295: Application Specification (AdrenaLINE Slingshot 92-Ohm 224G Cable System)
- 114-78104: Application Specification (224G AdrenaLINE Slingshot High Density R/A PCB-mount connector)
- 501-TBD: Qualification Test Report

2.2. Industry Standard

- EIA-364 Electrical Connector/Socket Test Procedures including Environmental Classifications

2.3. Reference Document

- 109-197 Test Specification (AMP Test Specifications vs. EIA and IEC Test Methods)

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Ratings

- Voltage: 80 volts AC maximum peak (1/3 of minimum withstanding voltage)
- Current: See Figure 2
- Temperature: -55 to +85 degrees Celsius

3.3. Test Performance Requirements and Procedures Summary

This product should meet the electrical, mechanical, and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

Test Description	Requirement	Procedure
Initial Examination	Meets product drawing requirements.	EIA-364-18. Visual and dimensional (CofC) inspection per product drawing.
Final Examination	Meets visual requirements.	EIA-364-18. Visual Inspection.
ELECTRICAL		
Low Level Contact Resistance (LLCR)	△R 10 milliohms maximum for individual signal reading	EIA-364-23. Subject specimens to 100 milliamps maximum and 20 millivolts maximum open circuit voltage. See Figure 3
Insulation Resistance	1000 MΩ minimum	EIA-364-21. 100 volts DC, 2 minute hold. Test between adjacent contacts of mated specimens.
Withstanding Voltage	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 250 volts AC at sea level. Test between adjacent contacts and signal contacts to ground of mated specimens.
Temperature Rise vs. Current	30°C maximum temperature rise at the current ratings shown in Figure 2.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1°C.
Signal Integrity	TBD	TBD
MECHANICAL		
Mating Force	1.5 N [.34 lb] maximum average per differential pair including ground.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Unmating Force	0.55 N [.12 lb] minimum average per differential pair including ground.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Cablet Retention	44.5 N [10 lb] minimum per cablet.	Measure force necessary to pull the cablet out of the housing at a maximum rate of 12.7 mm [.5 in] per minute.
Durability	No physical damage and post testing LLCR. See note	EIA-364-9. Mate and unmate specimens for 200 cycles at a maximum rate of 600 cycles per hour.

Figure 1 (Cont'd)

Test Description	Requirement	Procedure
Durability (Pre-Conditioning)	No physical damage and post testing LLCR	EIA-364-9. Mate and unmate specimens for 20 cycles at a maximum rate of 600 cycles per hour.
Mechanical Shock	No physical damage or discontinuities of 1 microsecond or longer in duration.	EIA-364-27, Test Condition A. Subject mated specimens to 490 m/s² (50 G's) half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 5.
Random Vibration	No physical damage or discontinuities of 1 microsecond or longer in duration.	EIA-364-28 Test Condition VII, Condition D, Subject mated specimens to 3.10 G's rms between 20 to 500 Hz. 15 minutes in each of 3 mutually perpendicular planes. Secure connector to vibrating surface and hold cable a minimum of 4" from back of connector. See Figure 5.
Minute Disturbance	No physical damage and post testing LLCR.	Unmate and mate each connector pair a distance of approximately 0.1mm [.004 in].
Minimum Bend Radius	Pass signal integrity in all bend positions.	Two SI test boards with RA connectors, a double ended cable assembly mated to each where full mating is guaranteed throughout duration of the test. Test SI with cable exiting straight then bend the cable 90° up, left, down and right testing SI at each location around min bend radius mandrel Distance from back of cabled connector TBD. Diameter of mandrel pin TBD.
Cable Pull	No physical damage or discontinuities of 1 microsecond or longer in duration and post testing signal integrity.	Two SI test boards with RA connectors, a double ended cable assembly mated to each where full mating is guaranteed throughout duration of the test. Pull an individual differential pair cable straight, 90° up, 90° left, 90° down and 90° right to 6 N at TBD mm/min and hold for 1 minute for each pull.

Test Description	Requirement	Procedure
ENVIRONMENTAL		
Thermal Shock	No physical damage and post testing LLCR.	EIA-364-32, Method A, Test Condition II. Subject mated specimens to 10 cycles between -65 and 105°C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures.
High Humidity / Temperature Cycling	No physical damage and post testing LLCR.	EIA-364-31, Method IV. Subject mated specimens to 50 cycles (800 hours total, no 8 hr ambient dwell in each cycle) between 5 and 85°C at 80 to 100% RH.
Temperature Life	No physical damage and post testing LLCR.	EIA-364-17, Method A, Test time condition D. Subject mated specimens to 105°C for 1000 hours.
Temperature Life (Pre-Conditioning)	No physical damage and post testing LLCR.	EIA-364-17, Method A, Condition D. Subject mated specimens to 105°C for 497 hours.
Mixed Flowing Gas	See note.	EIA-364-65, Class IIA (4 gas). Subject specimens to environmental Class IIA for 20 days total (10 days unmated followed by 10 days mated).
Thermal Cycling	Pass signal integrity.	TBD.

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 3.

Figure 1

Pair Size	Current Rating (Amps) Fully Energized
4 - 6	0.50
7 - 12	0.25

Figure 2

3.4. Product Qualification and Requalification Test Sequence

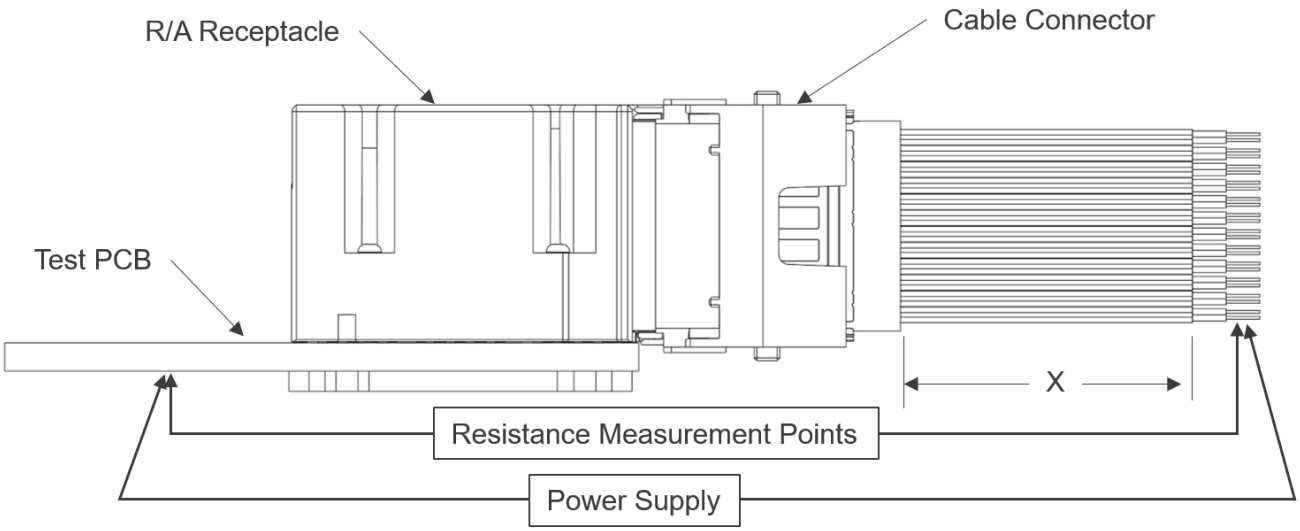
Test or Examination	Test Group							
	1a (a)	1b (a)	2	3	4	5	6	7
	Test Sequence (b)							
Initial Examination	1	1	1	1	1	1	1	1
LLCR	2,4,6,8		2,4,7,9, 11,13,15, 18	2,4,6	2,4		2, 4, 6, 8, 10, 12	
Insulation Resistance		5						
Withstanding Voltage		6						
Temperature Rise vs Current					3			
Signal Integrity						2,4		3,5
Mate Force			6,17					
Unmate Force			5, 16					
Cablet Retention				7				
Durability			8					
Durability (Pre-Condition)	3	2	3	3			3	
Mechanical Shock			14					
Random Vibration			12					
Minute Disturbance							11	
Minimum Bend Radius								2
Cable Pull								4
Thermal Shock	5	3						
High Humidity / Temp Cycling	7	4						
Temperature Life				5				
Temperature Life (Pre-Condition)			10				5	
Mixed Flowing Gas (mated)							9	
Mixed Flowing Gas (unmated)							7	
Thermal Cycling						3		
Final Examination	9	7	19	8	5	5	13	6

NOTE

a) Test Group 1a – samples on test boards for LLCR measurement. Test Group 1b – Loose-Piece samples for IR/DWV testing.

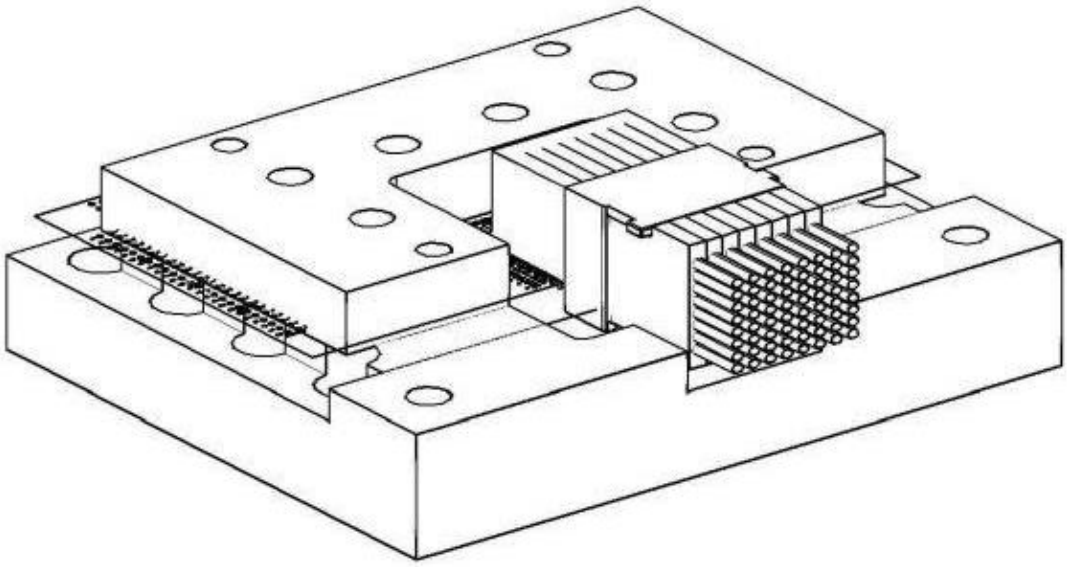
b) Numbers indicate sequence in which tests are performed.

Figure 3



Note: ”X“ Length of wire bulk include in initial measurement.
For cable-to-cable test configuration. Dim X applies to both side,

LLCR Measurement Points
Figure 4



Vibration and Mechanical Shock Mounting Fixture
Figure 5