

CLOUDSPLITTER Connector System

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for the CLOUDSPLITTER connector system.

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 DOCUMENTS

The following 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. Industry Document

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- TIA 568-C.2: Balanced Twisted Pair Telecommunications Cabling and Components Standards
- FCC Rules for Registration of Telephone Equipment Part 68, Subpart F, Connectors

2.2. Reference Documents

- 109-197: Test Specification (AMP Test Specifications vs. EIA and IEC Test Methods)
- 114-32051: Application Specification (CLOUDSPLITTER SMT jack connector)
- 114-32099: Application Specification (CLOUDSPLITTER cable plug connector)
- 501-134024: Qualification Test Report (CLOUDSPLITTER connector system)

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

- Signal Contacts:
 - Current, per pin: 1.5 amperes alternating current maximum
 - Voltage: 150 volts AC maximum
- Power Contacts:
 - Current, per pin :5 amperes direct current
 - Voltage : 50 V DC maximum
- Shielding Effectiveness: 20 dB minimum reduction from 30 to 400 MHz
- Temperature : -40°C to +85°C

3.4. Performance and Test Description

Product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawings, 114-32051 and 114-32099	EIA-364-18. Visual, dimensional and functional per applicable inspection plan.
ELECTRICAL		
Termination resistance, dry circuit.	20 mΩ maximum (Power Contacts) ΔR of 5 mΩ maximum ΔR of 30 mΩ (Signal Contacts)	EIA-364-23. Subject mated plug and jack to 20 milli-volts open circuit at 100 milli-amperes maximum. See Figure 3, 5.
Termination resistance, rated current.	20 mΩ maximum (Power Contacts) ΔR of 5 mΩ maximum ΔR of 30 mΩ (Signal Contacts)	EIA-364-6. Measure potential drop of mated plug and jack while carrying 1.5 amperes (signal contacts) and 5.0 amperes (power contacts) current. See Figure 3, 5.
Insulation resistance.	500 M Ωminimum.	EIA-364-21. Test between adjacent contacts of mated plug and jack.
Dielectric withstanding voltage.	One minute hold.	EIA-364-20, Condition I. 1000 volts AC (rms) 60 Hz. Test between adjacent contacts of mated plug and jack. Test between mated contacts and shield.
Temperature rise vs. Current	35°C maximum temperature rise at specified current (100% energized). 1.5 A for Signal contact 5.0 A for power contacts	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1°C.
Breaking capacity of power contacts - High	No evidence of physical damage.	IEC 61984, section 7.3.5. Test at 50VDC, 2A for 150 cycles
Breaking capacity of power contacts - Low	No evidence of physical damage.	IEC 61984, section 7.3.5. Test at 50VDC, 0.2A for 1500 cycles
Breaking capacity of signal contacts - High	No evidence of physical damage.	IEC 61984, section 7.3.5. Test at 50VDC, 0.3A for 150 cycles

Test Description	Requirement	Procedure
Breaking capacity of signal contacts - Low	No evidence of physical damage.	IEC 61984, section 7.3.5. Test at 50VDC, 0.01A for 1500 cycles
NEXT Loss	TIA-568-C.2 Category 5e Connecting Hardware	TIA-568-C.2
Return loss	TIA-568-C.2 Category 5e Connecting Hardware	TIA-568-C.2
Insertion loss	TIA-568-C.2 Category 5e Connecting Hardware	TIA-568-C.2
FEXT Loss	TIA-568-C.2 Category 5e Connecting Hardware	TIA-568-C.2

MECHANICAL

Vibration.	No discontinuities greater than 1 microsecond. Shall remain mated and show no evidence of physical damage.	EIA-364-28, Test Condition I. Subject mated plug and jack mounted on PCB to sinusoidal vibration for 15 minutes in each of 3 mutually perpendicular axes.
Durability.	No evidence of physical damage.	EIA-364-9. Subject plug and jack to 1500 mating and unmating cycles at the rate of 500 cycles per hour with latch inoperative.
Mating and unmating forces.	44N maximum mating 35N maximum unmating	EIA-364-13. Measure force required to mate plug and jack. Measure force required to un mate plug and jack with latch depressed.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Method A. Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Plug retention in jack.	Plug shall not dislodge from Jack. No physical damage to the Jack.	EIA-364-98. Apply axial load of 89 N to plug housing at a rate of 13 mm per minute with plug mated in jack and latch engaged. See Figure 4.
Plug latch deflection force	5 N maximum	EIA-364-13. Apply perpendicular load on the latch of the plug to depress it by 5 mm and determine the force.
Pull.	Plug shall remain mated with no evidence of damage.	EIA-364-38C, Condition E. Load cable in mated plug with a 75N pull in axial direction, rotate plug housing 45 degrees from cable axis, remove load. See Figure 4.
Jack retention to PCB. (Perpendicular)	Jack shall not dislodge from PCB. 95 N minimum after reflow soldering.	EIA-364-29C, Method C. Apply perpendicular load at a rate of 50 mm per minute to the jack mounted on a 1.57 mm thick PCB. See Figure 6.

Test Description	Requirement	Procedure
Jack retention to PCB. (Axial)	Jack shall not dislodge from PCB. 95 N minimum after reflow soldering.	EIA-364-29C, Method C. Apply axial load at a rate of 50 mm per minute to the jack mounted on a 1.57 mm thick PCB. See Figure 7.
ENVIRONMENTAL		
Thermal Shock	See note.	EIA-364-32 Subject mated plug and jack to 25 cycles between -40°C and + 85° C
Humidity/Temperature cycling	See note	EIA-364-31,Method III Subject specimens to 10 cycles(10days) between 25 and 65°C at 80 to 100% RH
Mixed Flow gas test	See note.	EIA-364-65,Class IIA Subject mated samples to environmental Class II A for 20 days
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4, Test Time Condition C. Subject mated specimens to 70°C for 96 hours.

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 Fig 2.

Figure 1 (end)

3.6. Connector Tests and Sequences

Test or Examination	Test group (a)										
	1	2	3	4	5	6	7	8	9	10	11
Test sequence											
Examination of product	1,8	1,6	1,8	1,7	1,7	1,6	1,3	1,4	1,6	1,3	1,3
Termination resistance, dry circuit	3,6	2,5		4,6		2,5					
Termination resistance, rated current					2,5						
Insulation resistance			2,6								
Dielectric withstanding voltage			3,7								
Temperature rise vs. current		3			3,6						
Vibration	4										
Mechanical shock	5										
Durability				5							
Mating force	2			2							
Un mating force	7			3							
Plug retention in jack								2			
Plug Latch Deflection Force						3					
Pull					4						
Jack retention to PCB – Perpendicular							2				
Jack retention to PCB – Axial								3			
Thermal shock			4								
Temperature/Humidity			5								
Mixed flow Gas test		4(c)									
Temperature life					4						
NEXT Loss									2		
Return Loss									3		
Insertion Loss									4		
FEXT Loss									5		
Breaking Capacity – High										2(d)	
Breaking Capacity - Low										2(d)	
Breaking Capacity – Signal - High										2(d)	
Breaking Capacity – Signal - Low										2(d)	

Figure 2:

Notes: (a) See paragraph 4.1.A.

(b) Numbers indicate sequence in which tests are performed.

(c) Precondition specimens with 10 durability cycles.

(d) Noted tests are run concurrently

4 QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen Selection

CLOUDSPLITTER connector test specimens shall be selected at random from current production lots and prepared for testing in accordance with current application specifications and instructions sheets. Test groups 1, 2, 3, and 5 shall each consist of at least 7 specimens. Test groups 4, 6, 7 and 8 shall consist of at least 3 specimens. Test groups 9, 10 and 11 shall consist of at least 2 specimens.

B. Test Sequence

Qualification inspection shall be verified by testing as specified in Figure 2.

4.2. Re-qualification Testing

If changes significantly affecting form, fit, or function are made to the product or manufacturing process, product assurance shall coordinate re-qualification testing, consisting of all or part of the original testing sequences as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If the product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before re-submittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

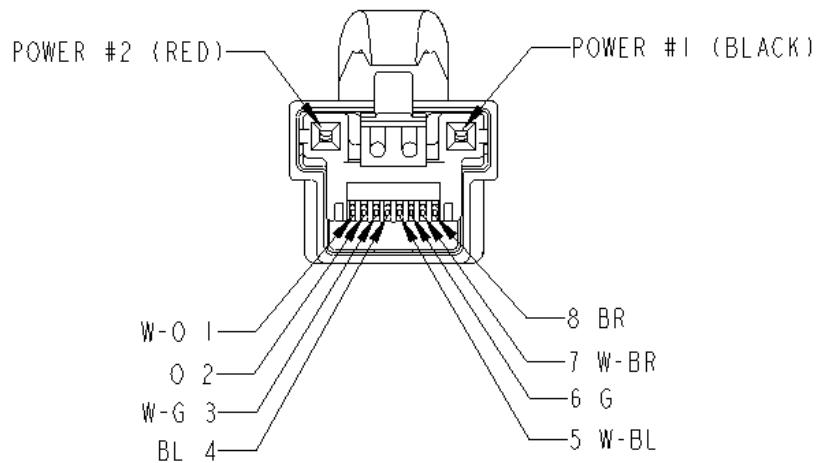


Figure 3
Front View CLOUDSPLITTER Plug
Cable Side LLCR and Discontinuity

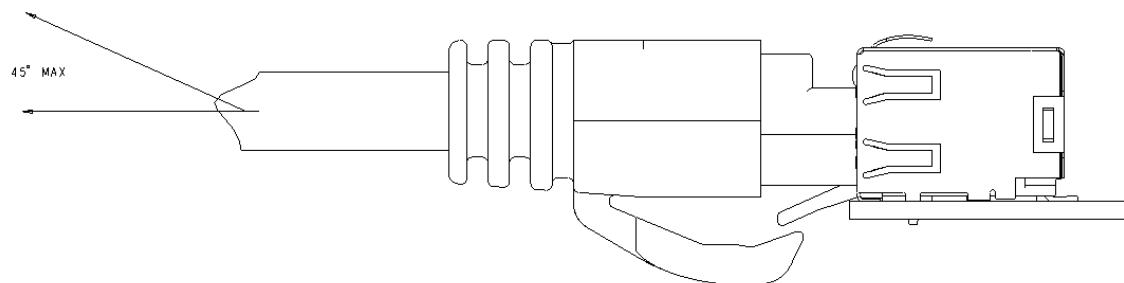
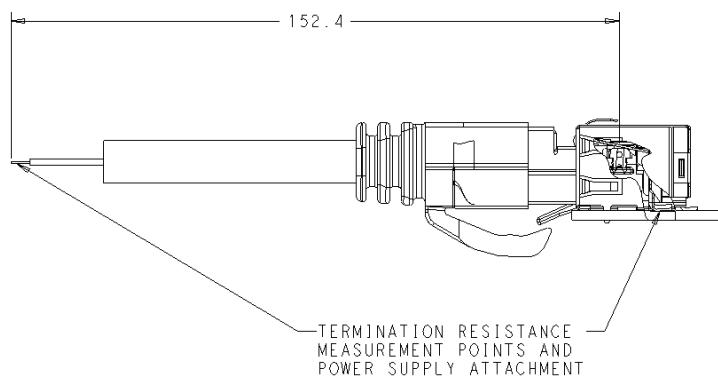


Figure 4
Plug Mating, Unmating and Retention Forces



NOTE: MILLIVOLT DROP (RESISTANCE) DUE TO WIRE LENGTH SHALL BE SUBTRACTED FROM ALL READINGS

Figure 5
Termination resistance measurement points

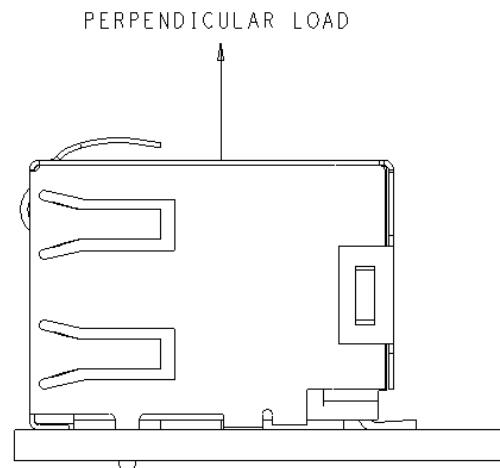


Figure 6
Jack retention force - Perpendicular

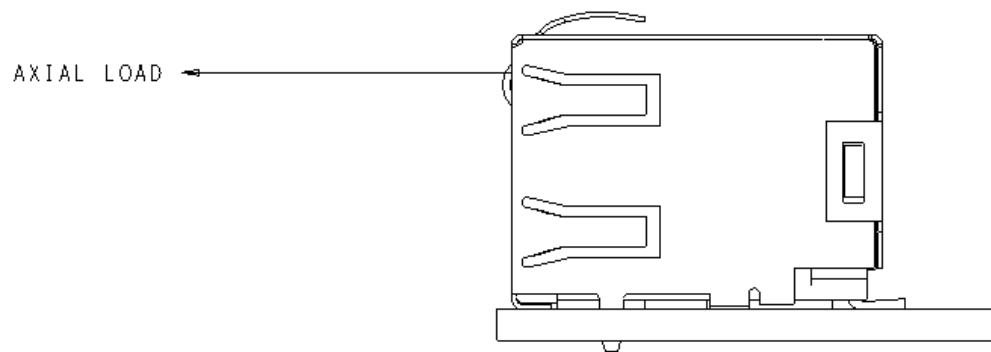


Figure 7
Jack retention force - Axial