RJ45 Modular Jacks With Integrated LEDs, Cat5

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity Right Angle RJ45 Modular Jacks with LEDs designed for intra-building use only.

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.

1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed on 01Aug07. The Qualification Test Report number for this testing is 501-659. This documentation is on file at and available from Engineering Practices and Standards (EPS).

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. TE Documents

- 114-13179: Application Specification (Category 5, Shielded, Offset, Press Fit, Modular Jacks with Integrated Light Emitting Diodes (LED))
- 501-659: Qualification Test Report (RJ45 Modular Jacks With Integrated LEDs, Cat5)

2.2. Industry Standards

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- FCC Part 68 : Connection of Terminal Equipment to the Telephone, Connector Specification
- TIA 568-B.2.: Commercial Building Telecommunications Cabling Standard

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 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

- Voltage: 150 volts DC for signal pairs, 2.0 volts DC for LED signals
- Current: 0.6 ampere maximum per signal contact; 0.020 ampere maximum for LED signals
- Temperature: -40 to 85°C

| Indicates Change

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions .

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing and Application Specification 114-13179.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing. Verify LED function using 2.1 volts at 20 milliamperes.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low level contact resistance.	ΔR 25 milliohms maximum.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3
Insulation resistance.	500 megohms minimum.	EIA-364-21. 500 volts DC, 2 minute hold. Test between adjacent contacts of unmated specimens not electrically connected.
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 1500 volts AC RMS at sea level. Test between the shield of the receptacle and all separable interfaces of the plug and receptacle.
MECHANICAL		
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition VII, Condition Letter D. Subject mated specimens to 3.10 G's rms between 20 to 500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Condition H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Durability.	See Note.	EIA-364-9. Mate and unmate specimens with the plug locking tab inoperable for 750 cycles at a maximum rate of 600 cycles per hour.

Figure 1 (condinued)

Test Description	Requirement	Procedure
Mating force.	20.02 N [4.5 lbf] maximum. See Note.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm [.5 in] per minute. See Figure 4.
Unmating force.	20.02 N [4.5 lbf] maximum. See Note.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm [.5 in] per minute. See Figure 4.
Plug retention in jack.	3.62 kg [8 lb] minimum. Show no evidence of physical damage to the jack. Plug shall not disengage from the jack.	EIA-364-98. Subject specimens to specified load applied for 1 minute in 2 directions with plug mated in jack and latch engaged, plus axial pull. See Figure 4.
Press fit insertion force.	2.22 kN [500 lbf] maximum.	Measure force necessary to press connector assembly onto printed circuit board into proper seating location at a maximum rate of 5.08 mm [.2 in] per minute. See Figure 4
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32. Subject specimens to 5 cycles between -40 and 85°C with 60 minute dwells at temperature extremes.
Humidity/temperature cycling.	See Note.	EIA-364-31, Method III. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH.
Temperature life.	See Note.	EIA-364-1000.01, Table 9. Subject mated specimens to 85°C for 240 hours.
Mixed flowing gas.	See Note.	EIA-364-65, Class IIA (4 gas). Subject mated specimens to environmental Class IIA for 14 days.
Thermal disturbance.	See Note.	Subject mated specimens to 10 cycles between 15 ± 3°C and 85 ± 3°C as measured on the part. Ramps shall be a minimum of 2°C per minute. Dwell times shall ensure that the contacts reach the temperature extremes (a minimum of 5 times). Humidity not controlled.

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)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)					
	1	2	3	4	5	6
	Test Sequence (b)					
Initial examination of product	1	1(c)	1	1	1	1(c)
Low level contact resistance	2,5,7	2,4,6	2,4,6,8			3,7
Insulation resistance				2,6		
Withstanding voltage				3,7		
Vibration, random	4					4
Mechanical shock						5
Durability						6
Mating force						2
Unmating force						8
Plug retention in jack					3	
Press fit insertion force					2	
Thermal shock		3		4		
Humidity/temperature cycling	6	5		5		
Temperature life	3(d)		3(d)			
Mixed flowing gas			5			
Thermal disturbance			7			
Final examination of product	8	7(c)	9	8	4	9(c)

NOTE

(a) See paragraph 4.1.A.
(b) Numbers indicate sequence in which tests are performed.
(c) LED function test shall be performed with current limiting power supply. Verify illumination on both LEDs, all ports.
(d) Precondition specimens with 50 durability cycles.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test group 1, 2, 3, 4 and 6 shall each consist of a minimum of 4 specimens. Test group 5 shall consist of 2 specimens.

B. Test Sequence

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

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence 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 product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

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.

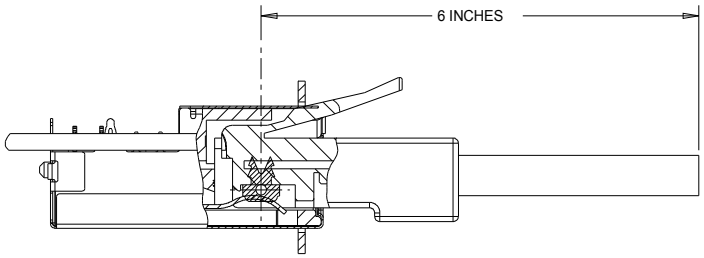

Figure 3
Low Level Contact Resistance Measurement Points

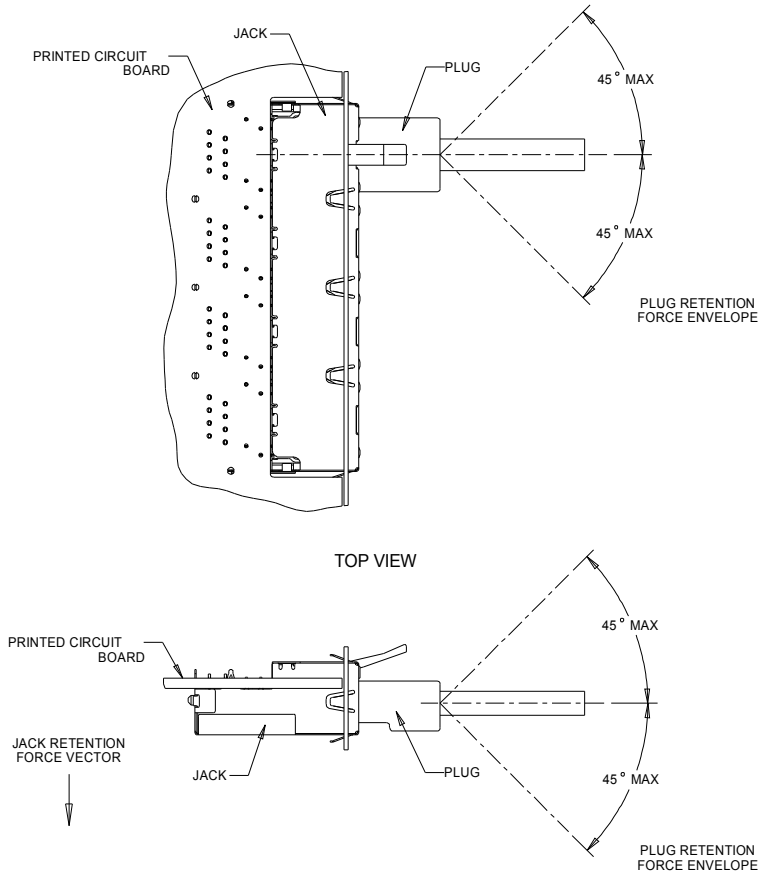

Figure 4
Mating and Unmating Forces
Plug Retention In Jack
Press Fit Insertion Force