
Pivot Power RJ45 Modular Plug Connectors

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for pivot power RJ45 modular plug connectors designed to mate with various RJ45 modular jacks. The pivot power RJ45 modular plug connector shall be terminated to wire sizes 2 through 18 AWG or 2 through 0.75mm² as defined on the product drawing and application specification.

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.

Successful qualification testing on the subject product line was completed on 31-December-2014. The qualification test report for this testing is 501-134034. After test validation, this documentation will be on file 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 Connectivity Documents

- [114-32052](#): (Application Specification) RJ45 Pivot Power Modular Plug Connectors
- [408-32086](#): (Instruction Sheet) Pivot Power RJ45 Modular Plug Connectors
- [501-134034](#): (Qualification Test Report) Pivot Power RJ45 Modular Plug Connectors

2.2. Reference Document

[109-197](#): Test Specification (TE Test Specifications versus EIA and IEC Test Methods)

2.3. Industry Documents

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- ISO/IEC 8877: Information Technology – Telecommunications and Information Exchange Between Systems

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Ratings

- Voltage: 60 volts AC/DC
- Current: 3.5 amperes maximum per circuit at 40°C ambient temperature
- Operating Temperature (dependent on temperature rating of cable):
North American cable, i.e., Belden 6300 UE: -40 to 85°C
European cable, i.e., Leoni H03VVH2-F: -40 to 70°C

Belden and Leoni are trademarks of their respective owners.

3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

Test Description	Requirement	Procedure
Initial examination of product	Meets requirements of product drawing and Application Specification 114-32052.	EIA-364-18 Visual and dimensional (C of C) inspection per product drawing.
Final examination of product	Meets visual requirements.	EIA-364-18 Visual inspection.
Electrical		
Low level contact resistance (LLCR)	Initial maximum total resistance of 200 milliohms maximum; after conditioning, ΔR of 30 milliohms maximum.	EIA-364-23 Subject mated plug and jack to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Insulation resistance	500 megohms minimum.	EIA-364-21 Test between adjacent contacts of unmated plug specimen only.
Dielectric withstanding voltage	One minute hold with no breakdown or flashover.	EIA-364-20, Test Condition I 1000 volts AC (rms) at sea level. Test between adjacent contacts of unmated plug specimen only.
Temperature rise versus current	30°C maximum temperature rise at 3.5 amperes.	EIA-364-70, Method 1 Stabilize at a single current level until 3 readings at 5-minute intervals are within 1°C.
Current cycling	No evidence of physical damage.	EIA-364-55, Condition B, Method 2 Subject mated plug and jack to 500 cycles at 125% of rated current for 15 minutes ON and 15 minutes OFF at room temperature.
Mechanical		
Random vibration	No discontinuities greater than 1 microsecond. See note.	EIA-364-28, Test Condition VII, test letter D. Subject mated plug and jack to random vibration for 15 minutes in each of 3 mutually perpendicular axis. See Figure 4. Note: Plug cable shall not be secured to vibration fixture.

Figure 1 (cont)

Test Description	Requirement	Procedure
Mechanical shock	No discontinuities of 1 microsecond or longer duration. See note.	EIA-364-27, Condition H Subject mated specimens to 30 Gs half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 4.
Durability	See note.	EIA-364-9 Subject plug and jack to 750 mating and unmating cycles at the rate of 500 cycles per hour with latch disengaged.
Mating and unmating forces	22.24 newtons maximum for plug and jack. Neither plug nor jack shall be shielded. If present, grounding tabs of shielded mating jack may have to be removed to perform this test.	EIA-364-13 Measure force necessary to mate plug and jack. Measure force to unmate plug and jack with latch disengaged. Mate and unmate specimens at a maximum rate of 12.7 mm per minute.
Plug retention in jack	Plug shall not dislodge from jack.	EIA-364-98 Apply axial load of 89 newtons to plug housing at a rate of 12.7 mm per minute with plug mated in jack and latch engaged. See Figure 5.
Cable retention in plug	Cable shall remain terminated to plug. See note.	EIA-364-38 With a 75.0-newton pull in axial direction, rotate plug housing 45 degrees from cable axis, and remove load. See Figure 6. Test shall be performed in unmated condition.
Environmental		
Thermal shock	See note.	EIA-364-32, Test Condition I Subject only unmated plug specimen to 25 cycles between -40 and 65°C with 30-minute dwells at temperature extremes and 1-minute transition between temperatures.
Humidity/temperature cycling	See note.	EIA-364-31, Method IV Subject only unmated plug specimen to 10 cycles (10 days) between 25 and 65°C, 95% RH.
Temperature life	See note.	EIA-364-17, Method A, Test Time Condition C (500-hour duration) When terminated to North American cable, subject only unmated plug specimen to Test Condition 3 (85°C). When Terminated to European cable, subject only unmated plug specimen to Test Condition 2 (70°C).

i **NOTE** Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in product qualification and re-qualification test sequence in Figure 2.

Figure 1 (end)

3.4. Product Qualification and Re-Qualification Test Sequence

Test or Examination	Test Group (a)					
	1	2	3	4	5	6
	Test Sequence (b)					
Initial examination of product	1	1	1	1	1	1
LLCR	3,6	2,5,7,9		2,4	2,4	4,6
Insulation resistance			2,6			
Dielectric withstanding voltage			3,7			
Current cycling					3	
Temperature rise versus current		3,10				
Random vibration	4	8 (d)				
Mechanical shock	5					
Durability						5
Mating force	2					2
Unmating force	7					3
Plug retention in jack	8					
Cable retention in plug				3		
Thermal shock			4			
Humidity/temperature cycling		4 (c)	5			
Temperature life		6				
Final examination of product	9	11	8	5	5	7



NOTES

(a) All test groups shall consist of a minimum of 10 connectors terminated to stranded wire size 18 AWG (7x26 AWG stranded) copper wire, and a minimum of 10 connectors terminated to wire size 0.75mm² (23 strands of 0.21 diameter).

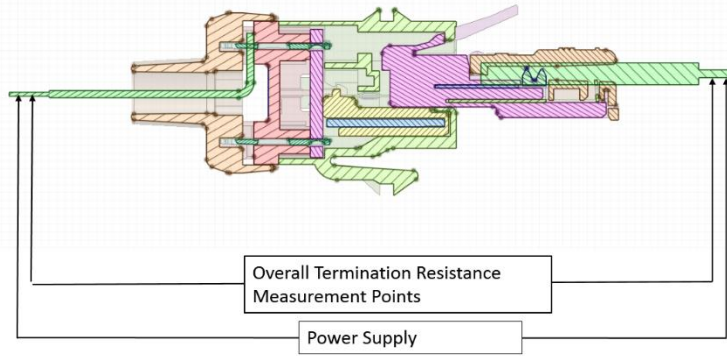
The two wire cable using the above described discrete wire types shall conform to the requirements described in 114-32052.

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

(c) Precondition with 5 durability cycles.

(d) Energize mated plug and jack to an 18°C T-rise level with 100% connector loading.

Figure 2



i NOTE

- (a) Termination resistance of this assembly consists of plug to jack contact resistance plus printed circuit board trace plus IDC terminal to discrete wire contact resistance. Printed circuit board trace length varies with each jack position, therefore, significant variations in termination resistance readings can be expected within each jack assembly.
- (b) Millivolt drop (resistance) due to wire lengths shall be subtracted from all readings.

Figure 3
LLCR Measurement Points

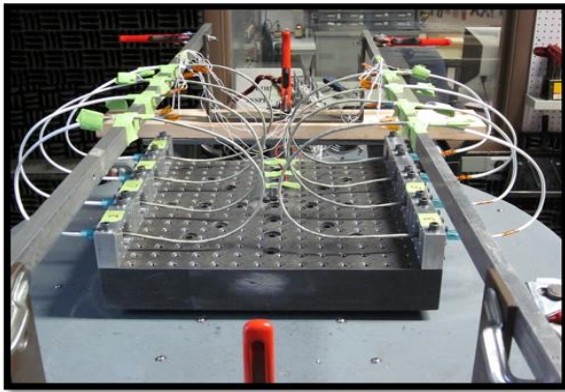


Figure 4
Vibration and Mechanical Shock Mounting Fixture

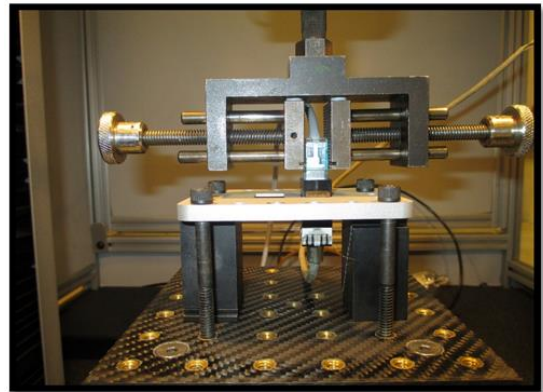


Figure 5
Plug Retention in Jack

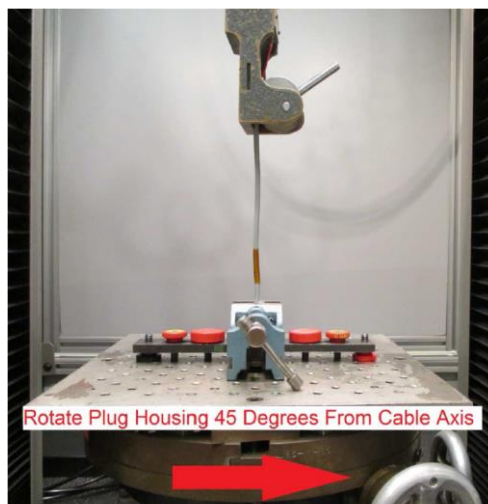


Figure 6
Cable Retention in Plug