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**Industrial Ethernet RJ45 Cable Assembly**

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**1. Scope**

## 1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of Industrial Ethernet Connector.

Applicable product description and part numbers are as shown in Fig 1.

P/N	Description	Note
1983523-1	RJ45 Robust Connector Plug Module	

Fig. 1

## 1.2 Qualification

When tests are performed on the subject product line, procedures specified in Figure 2 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 applied. 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

- 501-106053: Test Report

## 2.2 Industry Standard

- ANSI/TIA/EIA-568: Commercial Building Telecommunications cabling Standard
- EIA-364: Electrical Connector/Socket Test Procedures Including Environment Classifications
- IEC 60068: Basic Environmental Testing Procedures
- IEC 60512: Electromechanical Components For Electronic Equipment; Basic Testing Procedures and Measuring Methods Part 1: General

### 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. All used materials shall be RoHS compliant.

#### 3.3 Ratings

- Voltage: 150 Volts AC (rms)
- Current: 1.0A
- Temperature: - 40 to 70 ° C

#### 3.4 Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Fig 2. Unless otherwise specified, all tests shall be performed at ambient environmental condition.

#### 3.5 Test Requirements and Procedures Summary

Test description	Requirement	Procedure
<b>General Inspection</b>		
Examination of product	Product will be confirmed to the requirements of the applicable product drawing and spec.	Visually, dimensionally and functionally inspected per applicable quality inspection plan
<b>Electrical Inspection</b>		
Termination Resistance (Low level)	100 milliohms Maximum.	IEC 60512-2-1 Subject mated plug and terminated jack to 50millivolts maximum open circuit voltage at 100 milliamperes maximum. See Figure 4.
Insulation Resistance	500 megohms Minimum.	IEC 60512-3-1 Test voltage of 100 volts DC with 1 minute hold. Test between adjacent contacts of mated plug and terminated Jack.
Voltage proof	1 minute hold with no breakdown or flashover.	IEC 60512-4-1 1000 volts AC at sea level. Test between adjacent contacts of mated plug and jack.

Fig. 2 (continued)

Test description	Requirement		Procedure
Insertion Loss	Frequency (MHz) 1.0 4.0 8.0 10.0 16.0 20.0 25.0 31.25 62.5 100.0	Maximum Loss (dB) 3 3.9 5.5 6.2 7.9 8.9 10 11.2 16.2 21	ANSI/TIA/EIA-568, Category 5E (Link Performance).
Return Loss Measurement	Frequency (MHz) 1.0 4.0 8.0 10.0 16.0 20.0 25.0 31.5 62.5 100.0	Maximum Loss (dB) 19.0 19.0 19.0 19.0 19.0 19.0 18.0 17.1 14.1 12.0	ANSI/TIA/EIA-568, Category 5E (Link Performance).
Near End cross talk (NEXT) Measurement	Frequency (MHz) 1.0 4.0 8.0 10.0 16.0 20.0 25.0 31.25 62.5 100.0	Maximum Next (dB) 60.0 54.8 50.0 48.5 45.2 43.7 42.1 40.5 35.7 32.3	ANSI/TIA/EIA-568, Category 5E (link Performance).
<b>Mechanical Inspection</b>			
Plug insertion Force, Jack-plug interface	35 N Maximum		IEC 60512-13-1 Measure force required to mate plug and jack with latch depressed at a maximum rate of 12.7mm/minute.
Plug withdrawal Force, Jack-plug interface	36 N Maximum		IEC 60512-13-1 Measure force required to mate plug and jack with latch depressed at a maximum rate of 12.7mm/minute.
Durability, jack-plug interface	See Note		IEC 60512-9-1 Mate and unmate plug and jack interface with latch inoperative for 750 cycles at maximum rate of 500 (automatic) or 300 (manual) cycles per hour.
Cable pull-out	Plug shall remain mated with no evidence of damage.		Load cable in mated plug with 30N pull in axial direction, rotate plug housing 45degrees from cable axis, remove load. Fig 5.

Fig. 2 (continued)

<b>Test description</b>	<b>Requirement</b>	<b>Procedure</b>
Lock Strength	Connector must not unmate. No destruction on lock elements. No harmful damage on other part.	Mate connector and make lock mechanism effective. Apply axial load to cable on plug connector. 98N. 1 minute.
Vibration, jack-plug interface	No discontinuities of 1 microsecond maximum. Shall remain mated and show no evidence of physical damage. See Note.	EIA364-28 0.35mm magnitude@ 10...58Hz, 5G peek@ 58...500Hz; All 3 axis; 20cycles per axis
Mechanical shock, jack-plug interface	No discontinuities of 5 microseconds maximum. See Note.	EIA364-27 Accelerated Velocity: 50G Waveform: Half-sine wave Duration: 11 m sec. Number of Drops: 12drops each to normal and reversed direction of X,Y and Z axes, totally 72 drops.
<b>Environmental Inspection</b>		
Temperature Life(Heat Aging)	See Note	EIA 364-17 Subject mated plug and terminated jack at 85°C Duration: 96Hours
Thermal shock, jack-plug interface	See Note	IEC 60512-11-9 Subject mated plug and terminated jack to 25 cycles between -40 and 70°C Duration: 96Hours
Humidity- Steady state	See Note	IEC 60512-11-12 Subject mated plug and terminated jack to 55°C and 95% R.H. for 10 days
Humidity- Temperature Cycling	See Note	IEC 60068-2-38 Subject mated plug and terminated jack at Temperature: between 25 and 65°C Humidity: 80~100% R.H. Cycle: 7(cycle time 24 hours) sub-Cold shock -10°C performed
Mixed Flowing Gas	See Note	IEC 60512-11-7, Method 3. Subject mated plug and terminated jack to exposure for 21 days.

**NOTE** *Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Re qualification Test Sequence shown in Figure 3.*

Fig. 2 (end)

**3.6 Product Qualification Test Sequence**

Test or Examination	Test Group (a)									
	1	2	3	4	5	6	7	8	9	10
	Test Sequence (b)									
Examination of product	1,9	1,7	1,5	1,9	1,3	1,3	1,6	1,5	1,5	1,5
Termination Resistance (Low level)	2,6	2,5		2,8			2,5	2,4	2,4	2,4
Insulation Resistance	3,7	3,6								
Voltage proof	4,8									
Insertion Loss			2							
Return Loss Measurement			3							
Near End cross talk (NEXT) Measurement			4							
Plug insertion Force, Jack-plug interface				3,6						
Plug withdrawal Force, Jack-plug interface				4,7						
Durability, jack-plug interface				5						
Cable pull-out					2					
Lock Strength						2				
Vibration, jack-plug interface							3			
Mechanical shock, jack-plug interface							4			
Temperature Life(Heat Aging)								3		
Thermal shock, jack-plug interface									3	
Humidity- Steady state	5									
Humidity- Temperature Cycling		4								
Mixed Flowing Gas										3

**NOTE**

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which the tests are performed.

Fig. 3

**4. QUALITY ASSURANCE PROVISIONS**

**4.1 Qualification Testing**

**A. Specimen Selection**

Plugs and jacks shall be prepared in accordance with applicable Instruction Sheet and shall be selected at random from current production. Each test group shall consist of a minimum of 5 specimens.

**B. Test Sequence**

Qualification inspection shall be verified by testing specimens as specified in figure 3.

**4.2 Requalification testing**

If changes significantly affecting form, fit or function are made to the product or manufacturing process or controlling industry specification, 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 2. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmitted.

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.

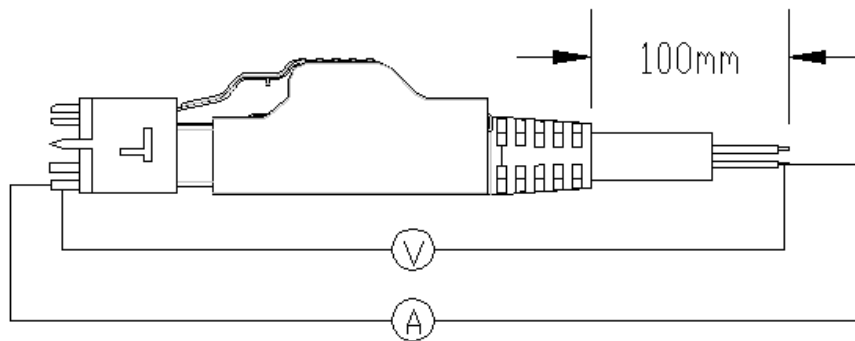


Figure 4  
Low Level Terminal Resistance Measurement Point

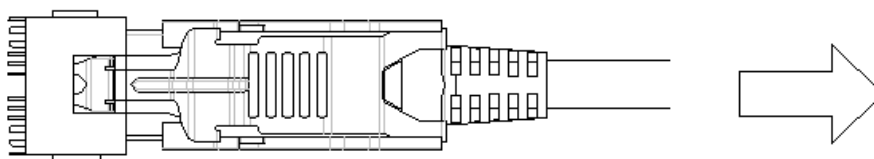


Figure 5  
Cable Pull-Out Measurement Method