
Connector System, RAST-Style, 7mm

1. SCOPE

1.1. Content

This specification covers performance, tests, and quality requirements for the TE Connectivity 7mm RAST-Style Connector System. The system is comprised of vertical mount, RAST-Style Printed Circuit Board (PCB) Headers and mating Positive Lock MKIII Receptacles with latching, keying and polarization similar to RAST 5 connectors.

1.2. Qualification

When tests are performed on the subject product line, the procedures specified in TE Connectivity 109-series specifications 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 conflicts between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. TE Connectivity Documents

- A. 109-1: General Requirements for Testing
- B. 109-series: Test Specification as indicated in Figure 2 (comply with EIA-364)
- C. 501-series: applicable Qualification Test Report

2.2. Industry Documents

- A. EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications (as specified/applicable)
- B. IEC 60512-11: Climatic Tests (as applicable/specified)

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

- A. Housings, header and receptacle: Thermoplastic, UL94V-0
- B. Contacts, Header: Copper Alloy, plating: Selective Tin over Nickel overall
- C. Contacts, Receptacle: Copper Alloy, plating: Tin overall

3.3. Ratings

- A. Voltage Rating: 250 VAC
- B. Current Rating: (USR and CNR)
 - 1. 20 amperes for selective tin over nickel plated header contacts, 3 positions max
 - 2. 16 amperes for selective tin over nickel plated header contacts mated to Positive Lock MKIII receptacles, 3 positions max
 - 3. Temperature Rating: -40°C to +120°C (UL certified RTI 140°C max)

3.4. Performance Requirements and Test Descriptions

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 per Test Specification 109-1.

3.5. Test Requirements and Procedure Summary (Figure 1)

NO.	TEST ITEMS	REQUIREMENTS	PROCEDURES
3.5.1	Examination of Product	Meets requirements of product drawing. No physical damage.	Visually, dimensionally and functionally inspected per applicable inspection plan.
ELECTRICAL REQUIREMENTS			
NO.	TEST ITEMS	REQUIREMENTS	PROCEDURES
3.5.2.1	Insulation Resistance	5000 Mohms min. (Initial) 5000 Mohms min (Final)	Measure by applying test potential between adjacent contacts of unmated connectors. EIA-364-21
3.5.2.2	Dielectric Strength	Tab headers must withstand test potential of 3000VAC for 1 min. Current leakage limit to 0.5mA max.	Measure by applying test potential between adjacent contacts of unmated connectors. EIA-364-20, Method B
3.5.2.3	Temperature Rise vs. Current	30°C Max T-Rise	Measure temperature rise of mated pair. Wire size and current per Whirlpool C-4, Table 5
MECHANICAL REQUIREMENTS			
NO.	TEST ITEMS	REQUIREMENTS	PROCEDURES
3.5.3.1	Header Tab Contact Retention Force	26.7 N [6 lbf] minimum. 22.2 N [5 lbf] minimum for parts using Glow Wire resin	Measure force necessary to remove contact tab from housing at a maximum rate of 12.7 mm [.5 in] per minute.
3.5.3.2	Contact Mating Force	40 N [9lbf] maximum	Measure force needed to mate Positive Lock MKIII Receptacle to PCB Header Tab. Depth of mating to be established by the receptacle dimple engaging with the tab hole. EIA 364-13 Method A
3.5.3.3	Latch Retention Force	4.45 N [1 lbf] MIN/57.8 N [13 lbf] MAX	Measure force needed to separate Positive Lock MKIII housing from mating header with no terminals present. EIA 364-98

Figure 1 (cont.)

NO.	TEST ITEMS	REQUIREMENTS	PROCEDURES
3.5.3.4	Receptacle Contact Insertion Force	13.35 N [3 lbf] MAX	Measure force needed to insert Positive Lock MKIII receptacle contact into receptacle Housing EIA 364-05.
3.5.3.5	Receptacle Contact Retention Force	80 N [18 lbf]MIN	Measure force needed to pull Positive Lock MKIII receptacle contact from receptacle housing. Condition parts prior to testing by drying in an oven at 35°C for 24hrs before testing. Parts must be tested within 2 hours after removing from the oven EIA 364-29

ENVIRONMENTAL REQUIREMENTS

NO.	TEST ITEMS	REQUIREMENTS	PROCEDURES
3.5.4.1	Temperature Life	No Physical Damage	Subject unmated connectors to temperature life at 85°C±2°C for 96 hours. EIA 364-17 Condition 3, Time Condition A
3.5.4.2	Humidity-Temperature Steady State	No Physical Damage	Subject unmated connectors to steady state humidity at 40°C±2°C and 90-95% R.H for 96hrs. EIA-364-31, Method II, Condition A
3.5.4.3	Solder ability	The inspected area of each lead must have 95% solder coverage minimum.	Temperature: 245±5°C, 3±0.5sec. EIA-364-52, Class I. Category 1.
3.5.4.4	Resistance to Soldering Heat	No Physical Damage	For through hole product: EIA-364-56, Procedure 3, Condition B. Subject connectors to solder bath at 260±5°C for 5±1 seconds (Flow soldering). The distance between the mounting surface and solder surface shall be 1.5 mm to 2.54mm
3.5.4.5	Cold	No Physical Damage	Acc. IEC 60512-11-10: -40°C, duration time: 2 hours Unmated
3.5.4.6	Dry Heat	No Physical Damage	Acc. IEC 60512-11-9 : 120°C, duration time: 7 days Unmated

Figure 1 (end)



NOTE

Product must be free of rust, corrosion transformation, crack and discoloration.



NOTE

Product shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification.

3.6. Product Qualification Test Sequence (Figure 2)

Test or Examination	Test Group								
	1	2	3	4	5	6	7	8	9
	Test Sequence (see Note)								
Examination of product	1	1,3	1,3	1,3	1	1,3	1,4	1,3	1
Insulation resistance					2,6				
Dielectric withstanding voltage					3,7				
Header tab contact retention force	2								
Latch retention force				2					
Temperature life					4				
Humidity-temperature cycling					5				
Solder ability		2							
Resistance to soldering heat			2						
Contact mating force						2			
Cold							2		
Dry heat							3		
Temperature rise vs current								2	
Receptacle contact insertion force									2
Receptacle contact pull out force									3

Figure 2



NOTE

The numbers indicate the sequence in which the tests shall be performed.

4. QUALITY ASSURANCE PROVISIONS

4.1. Test Conditions

Unless otherwise specified, all the tests shall be performed in any combination of the following test conditions shown in Figure 3.

Temperature	15-35°C
Relative Humidity	45-75%
Atmospheric Pressure	86.6-106.6 Kpa

Figure 3

4.2. Qualification Testing

A. Test Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test Group 1 shall consist of a minimum of ten (10) specimens. Test Groups 2 thru 8 shall each consist of a minimum of six (6) specimens.

B. Test Sequence

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

4.3. 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.

4.4. Acceptance

Acceptance is based on verification that the product meets the requirements as specified in 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.

4.5. 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.