



MULTIGIG RT 3 Connector System

1. SCOPE

1.1. Content

This specification covers the performance, testing, and quality requirements for the TE Connectivity (TE) MULTIGIG RT 3 Signal connector system which uses a modular concept and interconnects two printed circuit boards at a right angle. Both daughtercard and backplane connectors attach to the printed circuit boards (PCB's) through compliant pin press-fit contacts. These connectors are designed to enable data rates of up to 25 Gbps.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Table 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 MULTIGIG RT 3 Connector System was completed on 26JAN2019. Additional testing to expand temperature ratings was completed on 24NOV2020. The Qualification Test Report number for this testing is 501-134091.

2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- 114-163004: Application Specification for MULTIGIG RT 2, RT 2-R, RT 2-S, and RT 3
- 108-2072: Product Specification MULTIGIG RT Signal Connectors
- 501-134091: Qualification Test Report

2.2. Industry Documents

- EIA 364 Electrical Connector Performance Test Standards

2.3. Reference Document

- [109-197](#) Test Specification (TE Test Specification vs EIA and IEC Test Methods)

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

- Operating Temperature: -55 to 105°C
- Operating Voltage: 166 volts AC peak or DC
- Current: Signal Wafers: 1.5 ampere at <30°C (Single circuit, free air)
- Storage Temperature: -65 to 125°C

3.3. Test Requirements and Procedures Summary

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

Table 1

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Initial examination of product	Meets requirements of product drawing.	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, circuit.	80 milliohms maximum initial. 5 milliohms maximum average increase. 10 milliohms maximum individual increase.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage.
Low level contact resistance, compliant pin.	1 milliohm maximum initial. Immersion Tin Plated Thru Hole: 1 milliohm maximum change. ENIG Plated Thru Hole: 3 milliohm maximum change.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage.
Withstanding Voltage	1 minute hold of no breakdown or flashover	EIA-364-20 Condition I. 500 volts AC peak or DC at sea level. Test between any adjacent pair of signal contacts, or from any signal contact to an adjacent ground pin of mated specimens.

Mechanical

Random vibration	No discontinuities of 1 microsecond or longer duration. See note.	EIA-364-28. Test Condition V, Condition letter E, 16.91 GRMS, 50-2000hz, 8 hours each axis.
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Mechanical shock	No discontinuities of 1 microseconds or longer duration. See note.	EIA-364-27 Condition G, 100G sawtooth shock pulses, 6 milliseconds, Three shocks in each direction applied along 3 perpendicular planes, 18 shocks total.
Durability (500 Cycles)	See note.	EIA-364-9 Mate and unmate specimens for 500 cycles at a maximum rate of 500 cycles per hour.
Durability (50 Cycles)	Preconditioning cycles.	EIA-364-9 Mate and unmate specimens for 50 cycles at a maximum rate of 500 cycles per hour.
Mating force	0.75 N [2.7 ozf] maximum per contact. Average for entire connector.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm [0.5 in] per minute.
Unmating force	0.15 N [.54 ozf] minimum per contact. Average for entire connector.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm [0.5 in] per minute.
Compliant pin insertion, connector	22.25N [5lbf] maximum average per pin.	IEC 60352-5 Paragraph 5.2.2.2 Measure force necessary to correctly apply a connector assembly to a printed circuit board at a maximum rate of 12.7 mm [0.5 in] per minute.
Compliant pin retention, connector	1.78N [0.4lbf] minimum average per pin.	IEC 60352-2 Paragraph 5.2.2.3 Measure force necessary to correctly remove a connector assembly from a printed circuit board at a maximum rate of 12.7 mm [0.5 in] per minute.

ENVIRONMENTAL

Temperature life	See note.	EIA-364-17, Method A. Subject mated specimens to 125°C for 1000 hours. After exposure, unmate connector, clean the mating interface using chloroform, and remate the connector prior to performing final Low Level Contact Resistance, Circuit.
Thermal shock	See note.	EIA-364-32, Test Condition III, Test Duration A-3 Except subject mated specimens to 100 cycles between -65 and 125°C. 30 minute dwells at each temperature extreme.

Humidity/temperature cycling	See note.	EIA-364-31, Method IV. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH.
Low Temperature Storage	See Note	MIL-STD-810, Method 502, Procedure I – Storage Subject unmated specimens to -65C for 72 hours after achieving stabilization.


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 Table 2.

3.4. Product Qualification and Requalification Test Sequence

Table 2

TEST OR EXAMINATION	TEST GROUP				
	1	2	3	4	5
	TEST SEQUENCE (a)				
Initial examination of product	1	1	1	1	1
Low level contact resistance, circuit	2,6	3,9	2,7		6
Low level compliant pin resistance	3,7	4,10	3,8		
Random vibration			5		
Mechanical shock			6		
Durability (500 Cycles)		6	4		
Durability (50 Cycles)	4				
Mating force		2	10		5
Unmating force		5	9		
Compliant pin insertion, connector				2	4
Compliant pin retention, connector	8	11	11	3	
Temperature life	5				
Thermal shock		7			
Humidity/temperature cycling		8			
Low Temperature Storage					2
Withstanding Voltage					3
Final examination of product	9	12	12	4	7


NOTE

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

QUALITY ASSURANCE PROVISIONS

3.5. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Each test group shall consist of a minimum of 3 specimens.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Table 1 and 2.

3.6. 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.

3.7. Acceptance

Acceptance is based on verification that the product meets the requirements of Table 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.

3.8. 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.