
MULTIGIG* Extreme

1. SCOPE

1.1. Content

This document is specific to features, performance and testing of a metal shell and hardware kit which can be installed on MULTIGIG* RT2 based connectors to provide enhanced mechanical and electrical protection of the connector and its wafers. The shell is meant as a packaging alternative for the designer meeting spacing and profile requirements of the VPX architecture. The metallic shell contains multiple interlocking features which will interact with modified MULTIGIG RT2 housing slots for connector assembly. The shell will integrate guide/key hardware and may utilize this hardware for board attachment. The features are:

- Two basic sizes (VME 3U and 6U length) with option for specials.
- Shell material is passivated stainless steel (.024 inch maximum thickness) with optional space-application compatible materials.
- Hardware/Key set consisting of an Cu/Ni/Au plated aluminum guide socket, ground fault path and a 304 stainless steel guide pin
- Two guide pins minimum to be electrically functional.
- Shell extends beyond current connector wafer.
- Shell will channel ESD to chassis ground (ground fault path).
- MULTIGIG RT2 connector with shell integrated meets spacing and envelop requirements of the relevant specification (e.g.: V46).
- Shell provides supplemental EMI shielding and enhanced EMI shielding when used with EMI gaskets or other external shielding mechanisms.

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. Successful verification testing on the subject product line was completed on 16Sep10. The Engineering Report number for this testing is 502-1310. 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 Connectivity (TE) Document

502-1310: Engineering Report (MULTIGIG* Extreme)

2.2. Industry Documents

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- EN 61000-4-2: Electromagnetic Compatibility (EMC); Part 4: Testing and Measurement Techniques; Section 2: Electrostatic Discharge Immunity Test
- GR-63-CORE: NEBS Requirements: Physical Protection (Issue 3 - March 2006)

2.3. Government Document

MIL-STD-810: Environmental Engineering Considerations and Laboratory Tests

2.4. Reference Documents

- 108-2072: Product Specification (MULTIGIG RT* Signal Connectors, Tiers 1 and 2, and RT2 Mezzanine)
- 109-197: Test Specification (TE Test Specifications vs EIA and IEC Test Methods)
- VITA 46 - 01Jan07: VPX Base Standard
- VITA 47 - 01Jan05: Environments, Design and Construction, Safety, and Quality for Plug-In Units Standard

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

- Operating Voltage: 50 volts AC peak or DC
- Current: 1 ampere at < 30°C (single circuit, free air)
- Temperature: -55 to 105°C

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.	EIA-364-18. Visual and dimensional inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low Level Contact Resistance (LLCR).	80 milliohms maximum. ΔR 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.
Electrostatic Discharge (ESD).	20 volts maximum peak coupling voltage onto signal pin.	EN 61000-4-2. Air discharge, 15 kilovolts.

Figure 1 (continued)

Test Description	Requirement	Procedure
MECHANICAL		
Random vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition V, Condition Letter D. Subject mated specimens to 11.95 G's rms between 50 to 2000 Hz. Fifteen minutes in each of 3 mutually perpendicular planes. See Figure 4.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Method 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. See Figure 4.
Durability.	See Note.	EIA-364-9. Mate and unmate specimens for 200 cycles at a maximum rate of 500 cycles per hour.
Mating force.	0.75 N [2.7 ozf] maximum per contact. 702.6 N [157.95 lbf] maximum average for entire specimen.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm per minute.
Unmating force.	0.15 N [.54 ozf] minimum per contact. 142.1 N [31.95 lbf] maximum average for entire specimen.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm per minute.
Deflection (shell stiffness).	311.4 N [70 lbf] for front deflection. 133.4 N [30 lbf] for rear deflection.	Support board on the left and right edges of the card up to 2 mm [.079 in] inboard from the edge. Deflect center guide module 2.54 mm [.10 in] from top then repeat testing on bottom.
Benchtop handling, daughter card connector.	See Note.	MIL-STD-810, Method 516.6, Procedure VI. Eight total drops from a height of 121.92 mm [4.8 in].
Drop.	See Note.	GR-63-CORE Issue 3; March 2006; Section 5.3.2, Test Procedure-Circuit Packets (free-fall drops); 99 mm [3.9 in].

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
	Test Sequence (b)				
Initial examination of product	1	1	1	1	1
LLCR	3,6,9,13	3,6,9,13	3,6,9,13		
ESD				2	
Random vibration	7	7	7		
Mechanical shock	8	8	8		
Durability	5	5	5		
Mating force	2,10	2,10	2,10		
Unmating force	4,11	4,11	4,11		
Deflection (shell stiffness)	14	14	14		
Benchtop handling, daughter card connector	12	12	12		
Drop					2
Final examination of product	15	15	15	3	3

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

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. Each test group shall consist of 1 specimen.

B. Test Sequence

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.