Impact 85-Ohm Interconnect Systems

1. SCOPE

1.1. Content

This specification defines the performance, tests and quality requirements for the TE Connectivity (TE) Impact 85-ohm interconnect systems, which consists of modular groupings of broad-edge coupled signals with optional integrated guidance. These connectors are two-piece devices, which connect two printed circuit (pc) boards. The right-angle receptacle connectors (daughter card) and header pin connectors (backplane) are through-hole devices with eye-of-needle (EON) compliant pin terminals.

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 11 FEB 15.

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 Documents

501-134039: Qualification Test Report (Impact Interconnect Systems)
109-197: Test Specification (TE Test Specifications vs. EIA and IEC Test Methods)

2.2. Industry Documents

EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications

3. REQUIREMENTS

Design and Construction

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

3.1. Ratings

Non-Agency Voltage:	150 volts AC, rms DC maximum
Agency Voltage:	29.9 volts AC, rms DC maximum
Current:	0.75 ampere maximum per contact
Temperature:	-55° to 85°C

3.2. 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	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)	AR 10 milliohms maximum	EIA-364-23 Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Insulation Resistance	1000 megohms minimum	EIA-364-21 500 volts DC, 2 minute hold. Test between adjacent contacts of unmated specimens.
Withstanding Voltage	1-minute hold with no breakdown, flashover or leakage exceeding 5 milliamperes	EIA-364-20, Condition I 500 volts AC at sea level. Test between adjacent contacts of unmated specimens.
Compliant Pin Interface Resistance	1 milliohm maximum	EIA-364-23 Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. Contact inserted into pc board.
Mechanical		
Sinusoidal Vibration	No discontinuities of 10 nanoseconds or longer duration. 10 milliohms maximum change in LLCR. See Note (a).	EIA-364-28, Test Condition II Subject mated specimens to 10 to 500 to 10 Hz traversed in 1 minute with 1.5 mm maximum total excursion or 10-G peak. Three hours in each of 3 mutually perpendicular planes. See Figure 4.
Mechanical Shock	No discontinuities of 10 nanoseconds or longer duration. 10 milliohms maximum change in LLCR. See Note (a).	EIA-364-27, Condition H Subject mated specimens to 30-G half-sine shock pulses of 11-millisecond duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 4.
Durability	10 milliohms maximum change in LLCR.	EIA-364-9 Mate and unmate specimens for the numbers of cycles specified in Figure 2 at a maximum rate of 500 cycles per hour.
Mating Force	40 grams (average maximum per pin over entire assembly)	EIA-364-13 Measure force necessary to mate daughter card and backplane at a maximum rate of 25.4 mm per minute.
Unmating Force	8 grams (average minimum per pin over entire connector)	EIA-364-13 Measure force necessary to unmate daughter card and backplane at a maximum rate of 25.4 mm per minute.

Figure 1 cont.

Test Description	Requirement	Procedure
	Environmental	
Thermal Shock	10 milliohms maximum change in LLCR.	EIA-364-32, Test Condition I Method A, Test Duration A Subject mated specimens to 5 cycles between -55 and 85°C with 30-minute dwells at temperature extremes and 1-minute transition between temperatures.
Humidity/Temperature Cycling	10 milliohms maximum change in LLCR.	EIA-364-31, Method IV Subject mated specimens to 500 hours between 25° and 65°C at 80 to 100% RH
Temperature Life	10 milliohms maximum change in LLCR.	EIA-364-17, Method A, Test Condition 3, Test Time Condition C Subject mated specimens to 85°C for 500 hours.
Mixed Flowing Gas	10 milliohms maximum change in LLCR.	EIA-364-65, Class IIA (4 Gas) Subject specimens to environmental Class IIA for 20 days (10 days unmated followed by 10 days mated). Measure LLCR every 5 days.
Dust	10 milliohms maximum change in LLCR.	EIA-364-91 Subject unmated specimens to number 1 (benign) dust for 1 hour. Specimens shall not be removed from the chamber for a minimum of 1 hour after completion of the test.
Minute/thermal	See note.	Eia-364-110 (thermal Cycling) Condition A, Duration A Subject mated specimens to 10 cycles between 15 and 85 °C. Dwell until acclimated, transition approximately 10 degrees per minute.

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 given in Figure 2.

Figure 1

3.3. Product Qualification and Re-Qualification Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)					
	1	2	3	4(b)	5	6(c)
	TEST SEQUENCE (d)					
Initial Examination of Product	1	1	1	1	1	1
Low Level Contact Resistance	3,5	3,5	2,5,7,9	2,4,7,9,11	2,4,6,8,10, 12,14,16,18	
Insulation Resistance						2,6
Withstanding Voltage						3,7
Sinusoidal Vibration				6		
Mechanical Shock				8		
Durability			3(e),8(e)	3(e),10(e)	5(f),17(f)	
Mating Force	2,7	2,7				
Unmating Force	6	6				
Minute Thermal Disturbance					15	
Thermal Shock		4				4
Humidity/Temperature Cycling			6			5
Temperature Life	4				3(g)	
Mixed Flowing Gas					7,9,11,13	
Dust			4	5		
Final Examination of Product	8	8	10	12	19	8

a) Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production. Test groups 1, 2, 3, 5 and 6 shall each consist of 5 mated pairs.

b) Test group 4 shall consist of 10 specimens because separate specimens must be run for LLCR and discontinuity monitoring.

c) This test group not mounted on pc boards.

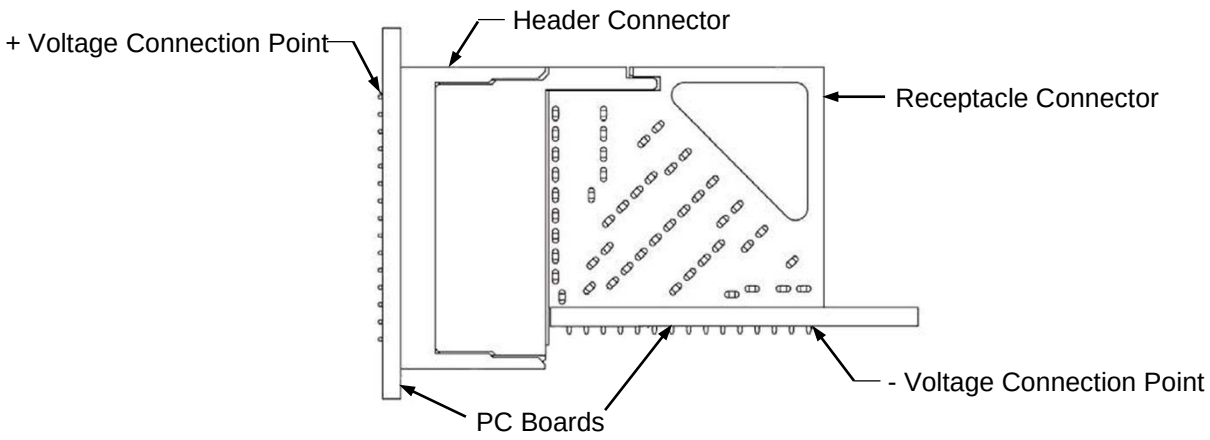
d) Numbers indicate sequence in which tests are performed.

e) 100 cycles only.

f) 98 cycles only.

g) 300 hours only.

Figure 2



± Current Applied Via PC Board Series Bus (All Contacts)

Figure 3. LLCR Measurement Points

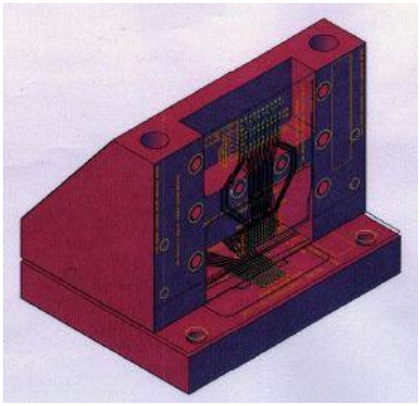


Figure 4. Vibration and Mechanical Shock Mounting Fixture

The thread forming screws used for the daughter card guidance modules will require varying torque to seat the screw dependent upon the screw engagement in the module. The screw length and the pc board thickness will both impact the screw engagement into the module. It is recommended that the torque applied be the minimum necessary to fully seat the screw for the specific application. For applications in which the board thickness exceeds the listed recommendations, testing should be conducted to confirm that 1.0 in.-lbs of torque can successfully be applied.

Connector	Screw	PC Board Thickness (mm)	Recommended Torque (in./lbs)
2- through 6-Pair Backplane Headers	2-56 Machine	6.5 Max	2.0
2- Pair Daughter Card Receptacles	2-32 Self-Tapping	1.8-2.4	1.0
3- Pair Standard Daughter Card Receptacles		1.9-2.5	1.5
3- Pair Ortho Daughter Card Receptacles		2.4 Max	1.0
4- through 6-Pair Daughter Card Receptacles		4.4 Max	2.0
3- through 5-Pair Mezzanine Receptacles	2-32 Self-Tapping	4.4 Max	2.0
2- Pair Ram Headers		4.0 Max	1.0
3- Pair Ram Headers		4.4 Max	1.5
4- through 6- Pair Ram Headers		4.4 Max	2.0

Figure 5. Torque Specification for Mounting Screws