

**ChipConnect Cable Assembly**

**1. SCOPE**

1.1. Content

This specification covers performance, test and quality requirements for the ChipConnect Cable Assembly as described in the Intel® Internal Faceplate-to-Processor cable assembly specification.

1.2. Qualification

When tests are performed on the subject cable assembly, procedures specified in Section 3.3 shall be used.

1.3. Qualification Test Results

Successful qualification testing on the subject cable assembly is documented in Engineering Test Report 502-130033.

**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

- 502-130033: Qualification Test Report

2.2. Intel Documents

#	Document No	Description
1	570411	Intel® Omni-Path Internal Faceplate-to-Processor (IFPA) Cable Assembly Design Specification
2	567280	Intel® Omni-Path Internal Faceplate-to-Processor (IFP) Cable Measurement Procedure
3	568627	Intel® IFP Cable MMM Test Script + User's Guide

2.3. Industry Documents

#	Document No	Description
1	ANSI/EIA-364-1000	Environmental Test Methodology for Assessing the Performance of Electrical Connector and Sockets used in Business Office Applications
2	ANSI/EIA-364-09	Durability
3	ANSI/EIA-364-17	Temperature Life
4	ANSI/EIA-364-32	Temperature Cycle
5	JESD22-A101C	Temperature Humidity

6	ANSI/EIA-364-53	Porosity
7	ANSI/EIA-364-38	Static Pull
8	ANSI/EIA-364-41	Strain Relief
9	ANSI/EIA-364-65	Mixed Forced Gas

**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

Current	Temperature
0.5 A per contact	Operating Condition: 24C, 78%RH to 77C, 6%RH

3.3. 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.	
Final examination of product	Meets visual requirements.	

**ELECTRICAL**

<b>Low Level Contact Resistance (LLCR)</b>	<b>Termination of connector to board carrier shall be included in the measurement</b> <b>Post Stress: The resistance change, which is defined as the change in LLCR between the reading after stress and the initial reading, shall not exceed 20 milliohms per contact for a maximum of 6 contacts per daisy chain</b>	<b>ANSI/EIA-364-23B, Option 1, 4-wire method, Subject mated contacts assembled in housing to 20 mV max open circuit at 100 milliohms max</b>

<b>MECHANICAL</b>		
<b>Durability</b>	<b>No evidence of physical damage. Cable must meet electrical requirements post stress</b>	<b>ANSI/EIA-364-09 Precondition 30 plug/unplug cycles</b>
<b>Shock Unpackaged Board Level</b>	<b>No visible mechanical damage, no chaffing of cables, cable must meet electrical requirements post stress</b>	<b>Trapezoidal shock 50g, +/- 10%, velocity change 170 inches/sec, +/- 10%, 3 drops in each of six directions are applied to each of three samples, configured as in a complete system, mounted in a rigid fixture that duplicates the support points in the actual application of the cable on the board</b>
<b>Vibration Unpackaged Board Level</b>	<b>No visible damage, chaffing of cables, cable must meet electrical requirements post stress</b>	<b>5 Hz @ 0.01 g<sup>2</sup>/Hz @ 0.02 G<sup>2</sup>/Hz (slope up), 20 Hz to 500 Hz @ 0.02 g<sup>2</sup>/Hz (flat), input acceleration is 3.13 g RMS, 10 minutes per axis for all 3 axes on all samples, random control limit tolerance is +/- 3 dB configured as in a complete system, mounted in a rigid fixture that duplicates the support points in the actual application of the cable on the board</b>
<b>Cable Bend Radius</b>	<b>Cable management in a system Cable must meet electrical requirements post stress</b>	<b>ANSI/EIA-364-41, test condition 1, circular jacket cable: 1) Individual Twinax strand, 90 degree tie around mandrel radius of 37.5 mm (2-port) and 25 mm (1-port) 2) Bundled cable, 90 degree tie around mandrel radius of 37.5 mm (2-port) and 25 mm (1-port)</b>
<b>Static Pull</b>	<b>Cable handling Cable must meet electrical requirements post stress</b>	<b>ANSI/EIA-364-38B, 1) Grip the LEC 54 backshell and pull on the cable to test cable attachment to the backshell &gt;= 10lb force, 3) Grip the IFP Plug and pull on the cable to test cable attachment to the plug &gt;= 10lb force</b>

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<b>Cable Agitation Test</b>	<b>Cable must meet electrical requirements post stress</b>	<b>While the connectors are all plugged in, at each interconnect, rotate the cable side clockwise and counterclockwise to agitate the connector interface to check for continuity disruptions of <math>\geq 5</math> ms</b>
<b>Strain Relief Test</b>	<b>Cable must meet visual inspection criteria and electrical requirements post stress</b>	<b>EIA364-41C, Mount cable in strain relief fixture, bend termination around mandrel, check for mechanical damage to termination, overmold strain relief and cable sheath</b>

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**ENVIRONMENTAL**

<p><b>Temperature Life</b></p>	<p>The mated connectors shall withstand 1000 hours maximum operating temperature Cable must meet electrical requirements post stress</p>	<p>ANSI/EIA-364-17, Method A (without electrical load) Assuming Arrhenius acceleration model activation energy = 0.7eV based on 77 C use condition for 7 years Test 125 C, 240 hours Perform in mated condition Precondition samples with five (5) mating and unmatings minimum</p>
<p><b>Temperature Cycle</b></p>	<p>Basis, cable mass = 3 gms Cable must meet electrical requirements post stress</p>	<p>ANSI/EIA-364-32, method A, test condition 1, test duration A-4, 500 cycles, -40 C (+0, -10C) to 100 C (+10, -0), Dwell time 30 minutes (-0/+1 minute), cycle time 60 minutes (-0/+2 minutes), soak time (15 minutes, product soaked at the two temperatures)</p>
<p><b>Temperature-Humidity</b></p>	<p>Cable assembly bend to 25mm bend radius or 37.5mm bend radius using bend radius fixture Cable must meet electrical requirements post stress</p>	<p>JESD22-A101C, 85C-85%RH 144 hrs, or 85C-60%RH 264 hrs, or 77C-60%RH 464 hrs</p>
<p><b>Porosity</b></p>	<p>Shall meet visual requirements.</p>	<p>ANSI/EIA364-53B: Nitric Acid Vapor Test, Gold Finish, Test Procedure for Electrical Connectors and Sockets</p>



**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.

3.4. Product Qualification and Requalification Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)							
	0	1	2	4a	4c	5	7	
	TEST SEQUENCE (b)							
Precondition 4x		1	1	1	1	1	1	
HSIO Test (Freq Domain)	1,7	2,7,11	2,7,11	2,8,12	2,8,12		2,7,11,15,19	
HSIO Test (Time Domain)	2,8	3,8,12	3,8,12	3,9,13	3,9,13		3,8,12,16,20	
Low Level Contact Resistance	3,6	4,6,10	4,6,10	4,7,11	4,7,11		4,6,10,14,18	
Visual Inspection	5			6	6	2,4		
Durability	4							
Temperature Life		5						
Reseat (c)		9	9	10	10		9,17	
Temperature Cycle			5					
Bend Radius							5(a)	
Temp-Humidity							13	
Unpackaged Vibration				5				
Unpackaged Shock					5			
Porosity						3		
Static Pull – Type 1								
Static Pull – Type 3								
Cable Agitation								
Strain Relief								
Final examination of product	9	13	13	14	14		21	



**NOTE**

- (a) Maintain cable in bent condition for the remainder of the test sequence
- (b) Numbers indicate sequence in which tests are performed.
- (c) Only required if initial post stress fails LLCR
- (d) LEC
- (e) IFP Plug

TEST OR EXAMINATION	TEST GROUP (a)						
	8b	9	10				
	TEST SEQUENCE (b)						
Precondition 4x	1	1	1				
HSIO Test (Freq Domain)	2,7,11,15,19	2,8,12	2,7,11,15,19				
HSIO Test (Freq Domain)	3,8,12,16,20	3,9,13	3,8,12,16,20				
Low Level Contact Resistance	4,6,10,14,18	4,7,11	4,6,10,14,18				
Visual Inspection		6					
Durability							
Temperature Life							
Reseat (c)	9,17	10	9,17				
Temperature Cycle							
Bend Radius							
Temp-Humidity							
Unpackaged Vibration							
Unpackaged Shock							
Porosity							
Static Pull – Type 1	5						
Static Pull – Type 3	13						
Cable Agitation		5					
Strain Relief			5(d),13(e)				
Final examination of product	21	14	21				



**NOTE**

- (a) Maintain cable in bent condition for the remainder of the test sequence
- (b) Numbers indicate sequence in which tests are performed.
- (c) Only required if initial post stress fails LLCRC
- (d) LEC
- (e) IFP Plug

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