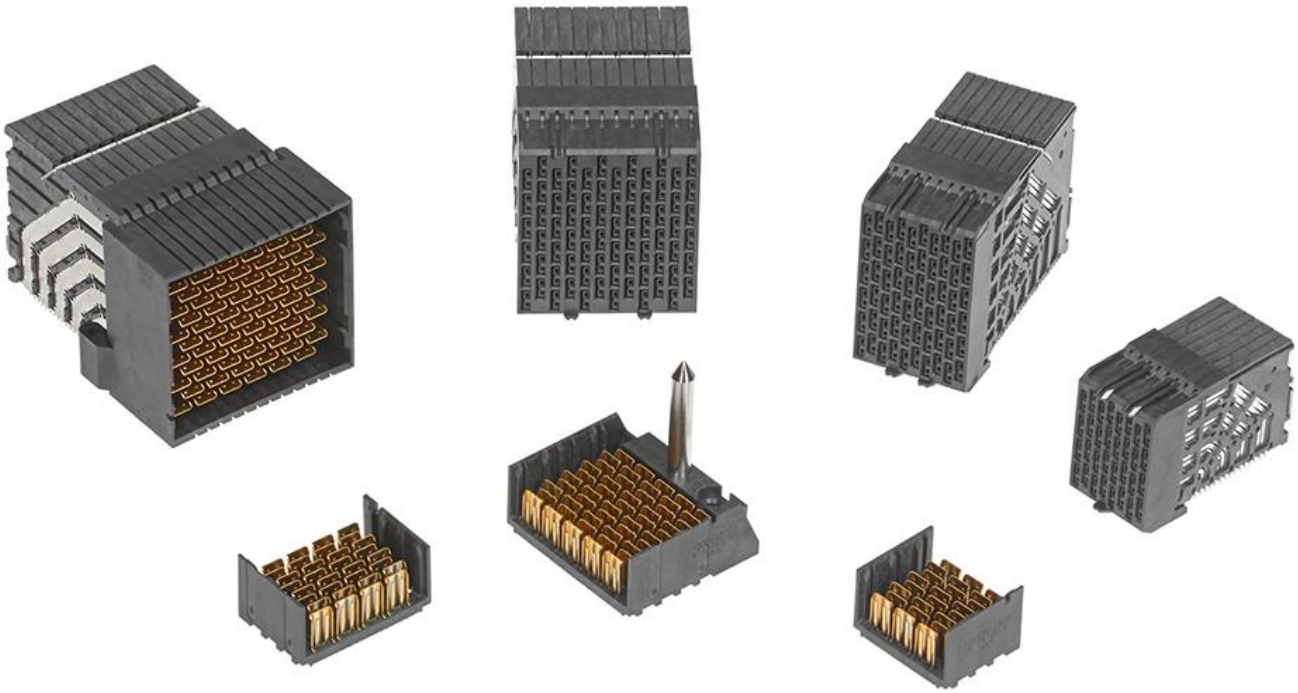
PRODUCT SPECIFICATION

PRODUCT SPECIFICATION FOR

Impel™

INTERCONNECT SYSTEMS



REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A1	EC No: **UCP2015-5282** DATE: **2015 / 06 / 12**	**PRODUCT SPECIFICATION FOR IMPEL INTERCONNECT SYSTEMS**	**1** of **9**

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1.0 SCOPE

This specification covers the performance requirements and test methods for the following products listed by series numbers:

* 171745	IMPEL 2 Pair Backplane Signal Module
* 171750	IMPEL 2 Pair Daughtercard Signal Module
* 171743	IMPEL 2 Pair Custom Backplane Signal Module
* 171335	IMPEL 3 Pair Backplane Signal Module
* 171990	IMPEL 3 Pair Daughtercard Signal Module
* 171333	IMPEL 3 Pair Custom Backplane Signal Module
* 171315	IMPEL 4 Pair Backplane Signal Module
* 171320	IMPEL 4 Pair Daughtercard Signal Module
* 171313	IMPEL 4 Pair Custom Backplane Signal Module
* 172140	IMPEL 4 Pair Right Angle Male (RAM) Signal Module
* 171325	IMPEL 4 Pair Backplane Signal Module – 3mm Pitch
* 171329	IMPEL 4 Pair Daughtercard Signal Module – 3mm Pitch
* 171323	IMPEL 4 Pair Custom Backplane Signal Module – 3mm Pitch
* 172135	IMPEL 4 Pair Right Angle Male (RAM) Signal Module – 3mm Pitch
* 172005	IMPEL 5 Pair Backplane Signal Module
* 172010	IMPEL 5 Pair Daughtercard Signal Module
* 172003	IMPEL 5 Pair Custom Backplane Signal Module
* 171395	IMPEL 6 Pair Backplane Signal Module
* 171400	IMPEL 6 Pair Daughtercard Signal Module
* 171393	IMPEL 6 Pair Custom Backplane Signal Module
* 172130	IMPEL 6 Pair Right Angle Male (RAM) Signal Module
* 171755	IMPEL 6 Pair Backplane Signal Module – 3mm Pitch
* 171760	IMPEL 6 Pair Daughtercard Signal Module – 3mm Pitch
* 171753	IMPEL 6 Pair Custom Backplane Signal Module – 3mm Pitch
* 171495	IMPEL 6 Pair Ortho Backplane Signal Module
* 171500	IMPEL 6 Pair Ortho Daughtercard Signal Module
* 171493	IMPEL 6 Pair Ortho Custom Backplane Signal Module
* 171740	IMPEL 6 Pair Ortho Direct RAM Signal Module

The IMPEL interconnect system consists of modular groupings of differential signals with optional integrated guidance. These connectors are two-piece devices, which connect two printed circuit boards. The right angle receptacle connectors (daughtercard) and header pin connectors (backplane) are through-hole devices with eye-of-the-needle compliant pin terminals.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME

IMPEL

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

Refer to the appropriate sales drawings for information on dimensions, materials, platings, and markings. The backplane header pins and shields are lubricated in the contact area with an approved lubricant per industry standard Telcordia GR-1217-CORE, Section 5.3.

Standard Product Plating:

Mate Zone:	30μIN Minimum Gold over 50μIN Minimum Nickel
Tail Zone:	30μIN to 60μIN Matte Tin over 50μIN Minimum Nickel
Overall:	50μIN Minimum Nickel

2.3 SAFETY AGENCY APPROVALS

UL File Number: E29179

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

Refer to the appropriate sales drawings and other sections of this specification for the necessary referenced documents and specifications.

3.1 MOLEX DOCUMENTS

AS-171320-990	IMPEL Routing Guide
AS-171500-990	IMPEL Ortho Routing Guide

3.2 COMMERCIAL STANDARDS

EIA-364	Electrical Connector Test Procedure
GR-1217-CORE	Generic Requirements for Separable Electrical Connectors used In Telecommunications Hardware

4.0 RATINGS

4.1 CURRENT AND TEMPERATURE RATING

Agency Voltage:	29.9 VAC RMS/DC max
Non-Agency Voltage:	150 VAC RMS/DC max
Signal Contact:	0.75 Amp per contact
Temperature:	-55°C to 85°C

4.2 ELECTRICAL RATINGS

Description	Value
Mating interface contact resistance change	10mΩ maximum
Compliant pin to plated through hole resistance	1mΩ maximum
Insulation resistance	1000 MegaΩ
Dielectric Withstanding Voltage	500 VAC

5.0 PERFORMANCE

5.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	**Contact Resistance (Low Level)**	Mated,100mA max, 20mV per EIA-364-TP23	10 milliohm maximum change
2A	**Insulation Resistance**	Unmated, 500VDC per EIA-364-TP21	1000 megaohms minimum
2B	**Insulation Resistance**	Mated State, 500VDC per EIA-364-TP21	1000 megaohms minimum
3A	**Dielectric Withstanding Voltage**	Unmated, 500VAC per EIA-364-TP20	No breakdown or flashover
3B	**Dielectric Withstanding Voltage**	Mated State, 500VAC per EIA-364-TP20	No breakdown or flashover
4	**Signal Continuity**	Mated per EIA-364-TP87	No interrupts greater than 10 nanoseconds
5	**Compliant Pin Interface Resistance**	Contact inserted into PCB per EIA-364-TP23	1 milliohm Maximum

5.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6	**Durability**	200 Cycles minimum, mated and unmated per EIA-364-TP09	10 milliohm max change in LLCR
7	**Vibration**	Mated, 10-500Hz, 10g's, 8 hr, 3 axis per EIA-364-TP28 with 10 ns event detection	10 milliohm max change in LLCR, zero events detected
8	**Mechanical Shock**	Mated, 30g half-sine,11ms, 3 axis per EIA-364-TP27 With 10 ns event detection	10 milliohm max change in LLCR, zero events detected
9	**Mating Force Per Pin**	Mate daughtercard and backplane assembly per EIA-364-TP13	60g max per signal pin 80g max per shield
10	**Unmating Force Per Pin**	Unmate daughtercard and backplane assembly per EIA-364-TP13	15g min per signal pin 15g min per shield

5.3 ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
11	**Thermal Shock**	Mated, 5 cycles from -55°C to 85°C per EIA-364-TP32	10 milliohm max change in LLCR
12	**Temperature Life**	Mated, 85°C for 1000 hours min per EIA-364-TP17	10 milliohm max change in LLCR
13	**Humidity Cycling**	Relative humidity 80 to 100% for 500 hrs per EIA-364-TP31	10 milliohm max change in LLCR
14	**Dust**	Unmated per EIA-364-TP91	10 milliohm max change in LLCR
15	**Mixed Flowing Gas**	10 days unmated 10 days mated per EIA-364-TP65 (Class IIA)	10 milliohm max change in LLCR

5.4 COMPLIANT PIN PERFORMANCE

5.4.1 Insertion Force for Various Plating Types

COMPONENT	MAX
IMPEL Backplane Pin	6 lbs
IMPEL Daughtercard Pin	6 lbs

Note: These max values are intended for press sizing only. Typical peak values are less than 4 lbs per pin. The peak force value will occur prior to the final seating of the connector. Plating surface finish and PCB materials will impact actual values.

5.4.2 Retention Force for Various Plating Types

COMPONENT	MIN
IMPEL Backplane Pin	0.8 lb
IMPEL Daughtercard Pin	0.8 lb

Note: Chart reflects minimum expected values for retention forces when tested in plated through holes drilled and plated as described in Section 5.4.3. Plating surface finish and PCB materials will impact actual values.

Radial hole deformation: 1.5 mils max Axial hole deformation: 1.0 mil max

5.4.3 Printed Circuit Board Specifications

Refer to the appropriate Sales Drawing for the recommended pcb thickness.
Refer to routing guide AS-171320-990 for the detailed plated hole requirements.

5.4.4 Torque Specification for Mounting Screws

PRODUCT TYPE	SCREW TYPE	BOARD THICKNESS	RECOMMENDED TORQUE **
BACKPLANE HEADERS	2-56 Machine Screw	6.5mm MAX	2.0 in-lbs
DAUGHTERCARD RECEPTACLES 2P	2-32 Self-Tapping Screw	1.6mm to 2.4mm	1.0 in-lbs
DAUGHTERCARD RECEPTACLES 3P THRU 6P	2-32 Self-Tapping Screw	4.4mm MAX	2.0 in-lbs

** Note: The thread forming screws used for the daughtercard guidance modules will require varying torque to seat the screw dependent upon the screw engagement in the module. The screw length and the pcb 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.

6.0 TEST SEQUENCE

Group 1	Group 2	Group 3	Group 4	Group 5
Temperature Life	**Thermal Shock**	**Humidity w/ Thermal Shock**	**Vibration & Mechanical Shock**	**Mixed Flowing Gas**
LLCR	LLCR	LLCR	LLCR	LLCR
T-Life +85°C for 1000 hours (mated)	Thermal Shock per GR-1217-CORE -55°C to +85°C 5 cycles min	Prewear - 100 cycles	Prewear - 100 cycles	T-Life 85°C for 500 hours (mated)
LLCR	LLCR	Dust Application	LLCR	LLCR
		LLCR	Dust Application	Prewear - 100 cycles
		Thermal Cycle per GR-1217-CORE +5°C to +85°C 500 hrs min w/humidity	LLCR	LLCR
		LLCR	Vibration per GR-1217-CORE 3 shock pulses each direction 10 nanosecond detect	MFG - 10 days Unmated w/LLCR every 5 days
		Postwear - 100 cycles	LLCR	MFG - 10 days Mated w/LLCR every 5 days
		LLCR	Mechanical Shock per GR-1217-CORE 3 shock pulses each direction 10 nanosecond detect	Disturbance - 1 cycle w/LLCR
			LLCR	Postwear - 100 cycles
			Postwear - 100 cycles	LLCR
			LLCR	
Supplemental				
Press Profile for each connector	Mate/Unmate Forces			