

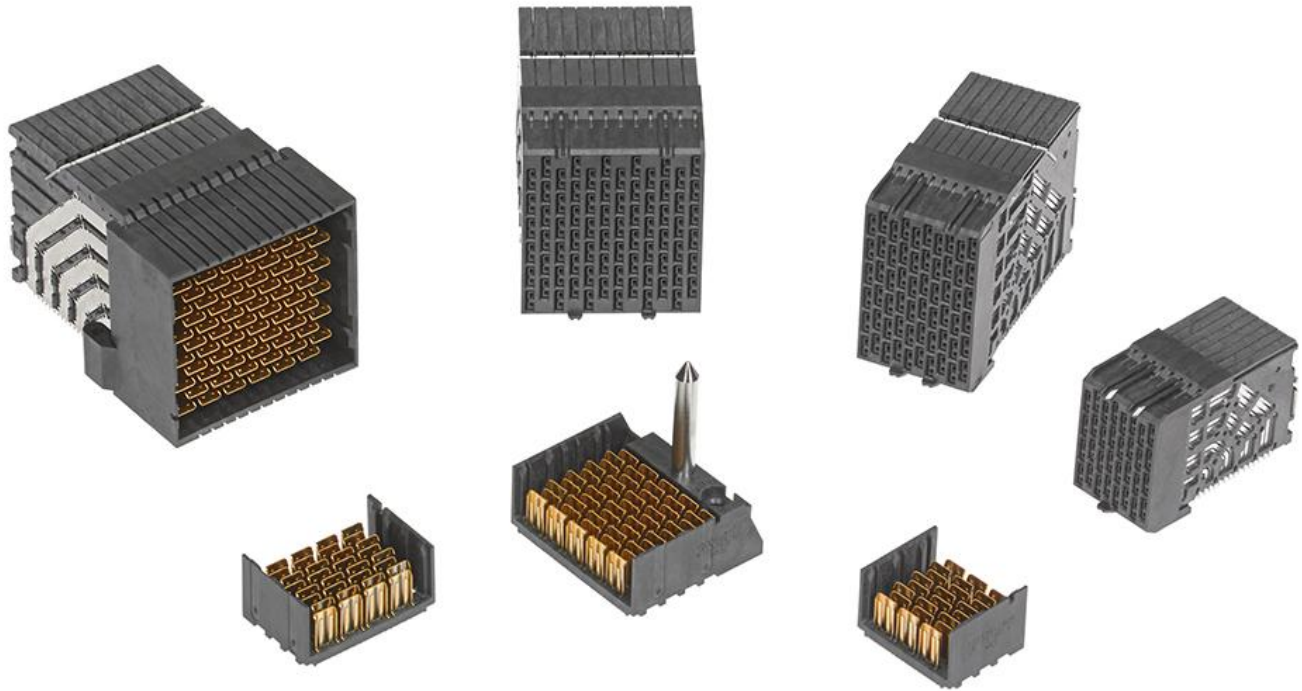


# PRODUCT SPECIFICATION

## PRODUCT SPECIFICATION FOR



## INTERCONNECT SYSTEMS



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| DOCUMENT NUMBER:<br><b>PS-171320-999</b> | CREATED / REVISED BY:<br><b>J. LAURX</b>  | CHECKED BY:<br><b>Z. BRADFORD</b>   | APPROVED BY:<br><b>D. MCGOWAN</b> |



# PRODUCT SPECIFICATION

## 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.

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# PRODUCT SPECIFICATION

## 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

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# PRODUCT SPECIFICATION

## 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      |

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# PRODUCT SPECIFICATION

## 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<br>80g max per shield         |
| 10   | Unmating Force Per Pin | Unmate daughtercard and backplane assembly per EIA-364-TP13                      | 15g min per signal pin<br>15g min per shield         |

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# PRODUCT SPECIFICATION

## 5.3 ENVIRONMENTAL REQUIREMENTS

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

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# PRODUCT SPECIFICATION

## 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.

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# PRODUCT SPECIFICATION

## 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.

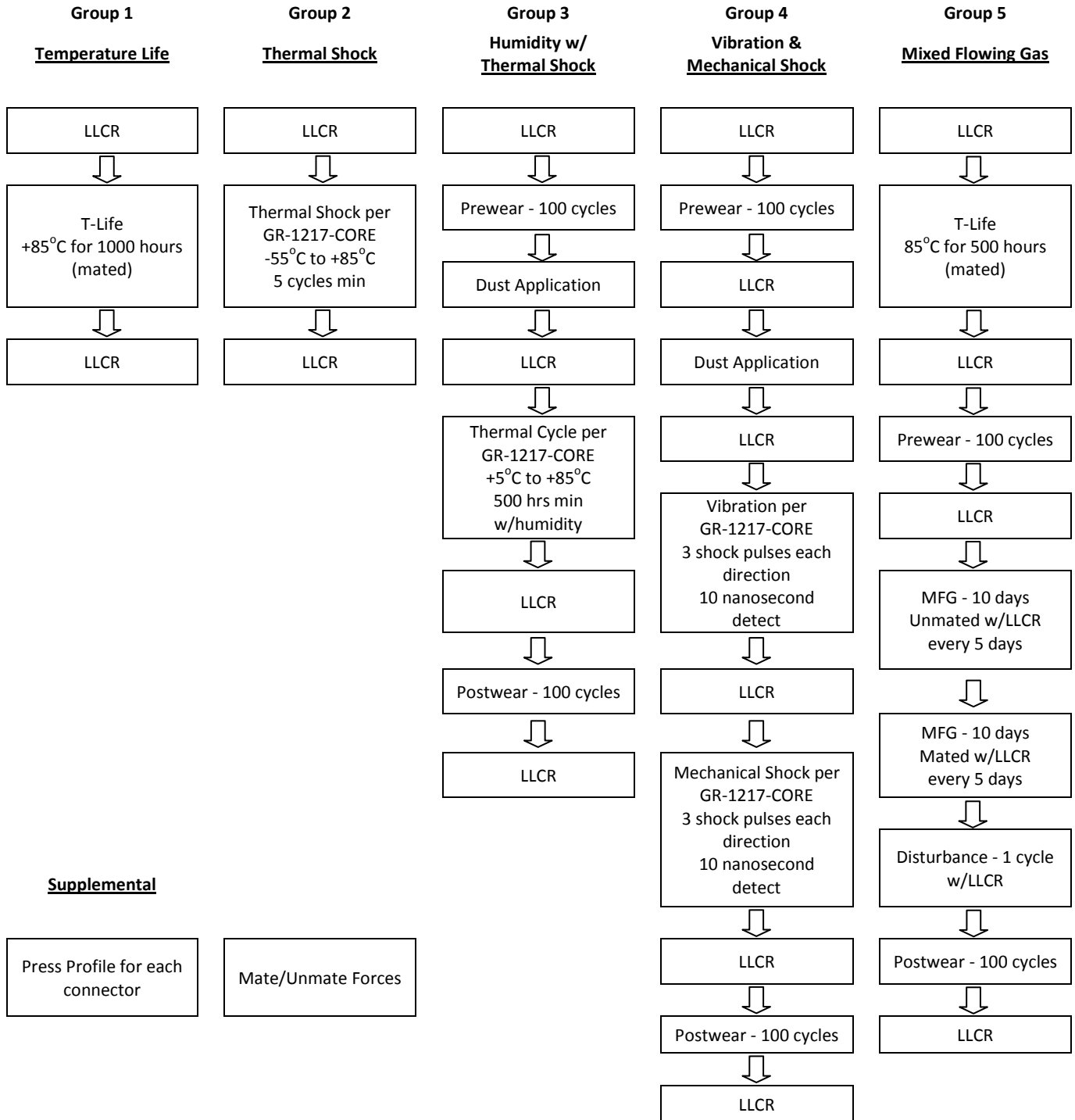
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# PRODUCT SPECIFICATION

## 6.0 TEST SEQUENCE



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