

NUMBER <b>GS-12 -1953</b>	CATEGORY <b>PRODUCT SPECIFICATION</b>	<b>Amphenol ICC</b>	
TITLE <b>0.5mm Board to board® Product Specification</b>		PAGE 1 of 6	REVISION A
		GUARDIAN (VERIFIED BY) Sanford Lu	DATE 03/27/2024
		APPROVED BY Tim Yao	
		CLASSIFICATION : <b>UNRESTRICTED</b>	

## 1.0 OBJECTIVE

This specification defines the performance, test, quality and reliability requirements of 0.5mm pitch Board to board® product Mating height 7.0mm~8.5mm.

## 2.0 SCOPE

This specification is applicable to the termination characteristics of 0.5mm pitch Board to board® family of products, which provides electrical connections between parallel mounted boards.

## 3.0 GENERAL

This document is composed of the following sections:

PARAGRAPH	TITLE
1.0	OBJECTIVE
2.0	SCOPE
3.0	GENERAL
4.0	APPLICABLE DOCUMENTS
4.1	Standards and Specifications
5.0	REQUIREMENTS
5.1	Qualification
5.2	Material
5.3	Finish
5.4	Design and Construction
5.5	Rating
6.0	PERFORMANCE
6.1	Performance
6.2	Test Methods
7.0	TEST SEQUENCE

## 4.0 APPLICABLE DOCUMENTS

### 4.1 Standards and Specifications

EIA 364: Electronic connector/socket test procedures including environmental classifications.

## 5.0 REQUIREMENTS

### 5.1 Qualification

Connectors furnished under this specification shall be capable of meeting the qualification test requirements specified herein.

### 5.2 Material

5.2.1 Housing: All housing materials shall be high temperature plastic, rated flame retardant 94V-0 in accordance with UL-94.

5.2.2 Receptacle Terminal: Copper alloy.

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5.2.3 Plug Terminal: Copper alloy.

5.2.4 Hold Down: Copper alloy.

5.3 Finish

The finish for applicable components shall be specified in product drawings with plating area, plating material and plating thickness.

5.4 The thickness of the PCB solder paste

Below data is FCI recommended dimension, For some customer's process are different (such as, PCB thickness, solder temperature, solder paste type, etc.), customer can according to the actual application environment adjust the solder paste thickness. using solder paste thickness 0.15mm Min.

5.5 Design and Construction

The connector shall be a multi-piece assembly having two rows of contacts with surface mount solder-tail terminations for installation on printed wiring board.

5.6 Rating

Voltage Rating	<30V AC
Current Rating	0.5A
Temperature Rating	-40°C ~ 125°C

**6.0 PERFORMANCE**

Unless otherwise specified, the performance of connectors given in the attached list shall satisfy the values specified in Table 6.1. The performance test shall follow the test method and the test sequence given in Table 6.2 & 6.3 under the environmental conditions listed below. All connectors to be tested shall be free of defects such as burr, flaw, void, blister etc. which will affect the life and application of connectors.

- Temperature ----- 15°C ~ 35°C
- Humidity ----- 25% ~ 85%
- Pressure ----- 86 ~ 106KP

6.1 Performance

TABLE 6.1

	Test Item	Requirements
6.1.1	Visual Examination	Product shall meet the requirements of product drawings. Visual Examination performed under 10X magnification.

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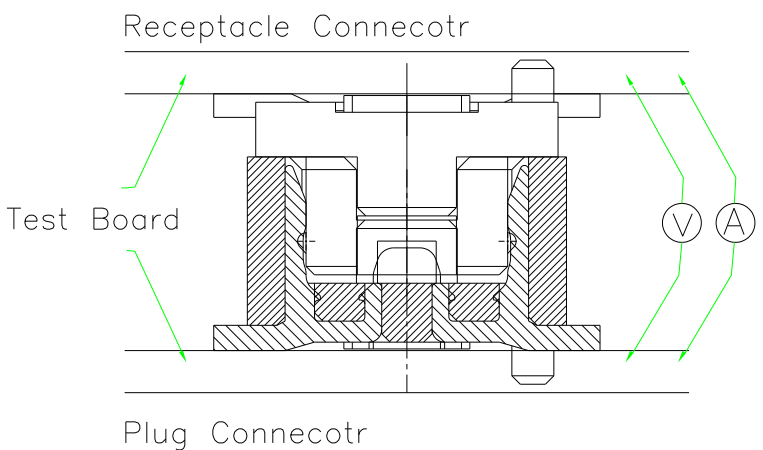
		Parts should be free from blistering, discoloration, cracks, etc
<b>Electric Requirements</b>		
6.1.2	Low Level Contact Resistance(LLCR)	Initial ----- 60 mΩ Maximum After test ----- 90 mΩ Maximum
6.1.3	Dielectric Withstanding Voltage	210 VAC,1 Minutes ,No evidence of arc-cover, insulation breakdown or leakage current in excess of 1 mA.
6.1.4	Insulation Resistance	500 MΩ Minimum
6.1.5	Current Rating	Temperature rise above ambient shall not exceed 30°C with all contacts powered at 0.5A
<b>Mechanical Requirements</b>		
6.1.6	Vibration	No discontinuity greater than 1 microsecond
6.1.7	Mating Force	10165430/10165431: 1.47N Maximum per contact
6.1.8	Un-mating Force	10165430/10165431: 0.15N Minimum per contact.
6.1.9	Normal Force	0.25N Min. Per mated Pair
6.1.10	Durability	Initial ----- 60 mΩ Maximum After test ----- 90 mΩ Maximum
6.1.11	Solder-ability	Solder coverage ----- 95% Minimum
6.1.12	Resistance to Solder Heat	No evidence of physical or mechanical damage.
6.1.13	Contact Retention Force	0.98N Minimum per contact.
<b>Environmental Requirements</b>		
6.1.14	Thermal Shock	Initial ----- 60 mΩ Maximum After test ----- 90 mΩ Maximum
6.1.15	Temperature Life	Initial ----- 60 mΩ Maximum After test ----- 90 mΩ Maximum
6.1.16	Cyclical Humidity & Temperature	Initial ----- 60 mΩ Maximum After test ----- 90 mΩ Maximum
6.1.17	Salt Spray	Initial ----- 60 mΩ Maximum After test ----- 90 mΩ Maximum

6.2 Test Methods

TABLE 6.2

	Test Item	Test Methods
6.2.1	Visual Examination	Visually and functionally inspected. Under 10X magnification.

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6.2.2	Low Level Contact Resistance(LLCR)	 <p style="text-align: center;">Figure 1</p> <p><b>EIA-364-23</b>  Test method of connection as Figure 1.  Test current ----- 100 mA Maximum  Open circuit ----- 20 mV Maximum  Number of readings ----- 100 separable contact interface minimum or 3 connectors whichever is greater</p>
6.2.3	Dielectric Withstanding Voltage	<p><b>EIA-364-20</b>  Test voltage ----- 210 Vrms AC  Duration ----- 1 minute  Current----- 1 mA Max  Measure between adjacent terminals of mated connectors.  Number of readings ----- 30 (10 readings per connector set)</p>
6.2.4	Insulation Resistance	<p><b>MIL-STD-202 Method 302</b>  Test voltage ----- 100 V DC  Measure between adjacent terminals of mated connectors.  Number of readings ----- 30 (10 readings per connector set)</p>
6.2.5	Current Rating	<p><b>EIA-364-70</b>                    25°C  Ambient still -----air  All contact powered -----0.5A</p>
6.2.6	Vibration	<p><b>EIA-364-28</b>  Frequency ----- 10-55-10 Hz  Amplitude-----1.5mm  Current----- 10 mA Max  Duration ----- 2 hours in each of three mutually perpendicular axes (6 hours total).</p>
6.2.7	Mating Force	<p><b>EIA-364-13</b>  Operating speed ----- 25 mm/minute  No lubrication and utilize free-floating fixture.  Number of connectors ----- 5 mated pair</p>
6.2.8	Un-mating Force	<p><b>EIA-364-13</b>  Operating speed ----- 25 mm/minute  No lubrication and utilize free-floating fixture.  Number of connectors ----- 5 mated pair</p>
6.2.9	Norma Force	<p><b>EIA-364-04A Method A</b></p>

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		Speed: 1mm/Min. Displacement: 0.075mm
6.2.10	Durability	<b>EIA-364-09</b> Operating speed ----- 25 mm/minute Number of cycles ----- 30
6.2.11	Solder-ability	<b>EIA-364-52</b> For Non- leaded: Solder temperature ----- 230 ± 5°C. Dip duration =3 sec Criteria: 95% coverage min
6.2.12	Resistance to Solder Heat	<b>EIA-364-56</b> For Non- leaded: Peak temperature ----- 260 ± 5°C. Duration ----- 60 seconds No damage
6.2.13	Contact Retention Force	Operating speed ----- 25 mm/minute
6.2.14	Thermal Shock	<b>EIA-364-32 Method A</b> Temperature range ----- -40 +0/-5°C to 125 +5/-0°C Time at temperature extremes ----- 30 minutes Test Duration (A-4) ----- 10 cycles Transfer Time ----- 5 minutes maximum
6.2.15	Temperature Life	<b>EIA-364-17</b> Subject product to 85±2°C for 96 hours
6.2.16	Cyclical Humidity & Temperature	<p><b>EIA-364-31, Method III (omit step 7b)</b> Temperature and humidity are listed figure 2. Duration ----- 10 cycles.</p>
6.2.17	Salt Spray	<b>EIA-364-26</b> 5±1% salt concentration 24 hours 35±2°C

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## 7.0 QUALIFICATION TEST MATRIX

TEST ITEM	TEST GROUP										
	Section	1	2	3	4	5	6	7	8	9	10
Visual Examination	6.2.1	1,9	1,5	1,3	1,3	1,3	1,7	1,5	1,10	1,5	1,3
Low Level Contact Resistance (LLCR)	6.2.2	2,8	2,4				2,4,6	2,4		2,4	
Dielectric Withstanding Voltage	6.2.3								3,6,9		
Insulation Resistance	6.2.4								2,5,8		
Current Rating	6.2.5										2
Vibration	6.2.6		3								
Mating Force	6.2.7	3,6									
Un-mating Force	6.2.8	4,7									
Normal Force	6.2.9										
Durability	6.2.10	5									
Solder-ability	6.2.11			2							
Resistance To Solder Heat	6.2.12				2						
Contact Retention Force	6.2.13					2					
Thermal Shock	6.2.14						3		4		
Temperature Life	6.2.15							3			
Cyclical Humidity & Temperature	6.2.16						5		7		
Salty Spray	6.2.17									3	
Number of Samples		5	3	3	3	3	3	3	3	5	3

## 8.0 RECORD RETENTION

REV	PAGES	DESCRIPTION	EC #	DATE
A	ALL	NEW RELEAS	-	27 Mar '24