

# PRODUCT SPECIFICATION

<b>Part Number</b>	BJ 4.00mm Series	<b>Rev</b>	A	<b>Date</b>	21/08/14		
<b>Product Description</b>	4.00mm Board to Board Header Connectors			<b>Page</b>	1		
<b>Doc Number</b>	BJ Series	<b>Prepared By:</b>	ST	<b>Checked By:</b>	AO	<b>Approved By:</b>	VJ

## 1.0 SCOPE

This specifies Pitch 4.00mm Header Connectors. The connector shall meet the performances, specified here under the condition with the plug connector and the receptacle connector mated.

This specification covers the product standards, requirements and qualification provisions.

## 2.0 APPLICABLE DOCUMENTS

At the time of this specifications release, the latest revisions of the following documents were used.

These documents shall form a part of this specification as described within this document.

### 2.1 Industry Specifications / Standards

UL-94 Flammability.

ASTM B-103 Phosphor Bronze or Brass Plate, Rod, Sheet, Strip and Rolled Bar.

### 2.2 EIA Specifications

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

## 3.0 REQUIREMENTS

### 3.1 Dimensional

Connectors shall meet the physical dimensions specified on the applicable product drawing.

### 3.2 Material

Each component shall be constructed of the materials specified within this document. Substitute materials must meet the performance requirements of this specification.

#### 3.2.1 Contacts

Phosphor Bronze

#### 3.2.2 Housings

LCP, flame retardant 94V-0 per UL-94; or other high performance resin.

### 3.3 Plating

#### 3.3.1 Contact Under Plate and Finish

Finish: Tin All Over (C), 70 $\mu$ " minimum – Under plate: Nickel 30 $\mu$ " minimum.

### 3.4 Design

#### 3.4.1 Mating

The connector shall be capable of mating and unmating manually with the test board.

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<b>Product Description</b>	4.00mm Board to Board Header Connectors			<b>Page</b>	2		
<b>Doc Number</b>	BJ Series	<b>Prepared By:</b>	ST	<b>Checked By:</b>	AO	<b>Approved By:</b>	VJ

## 3.5 Mechanical Requirements

### 3.5.1 Workmanship

The product shall be uniform in quality and free from defects (burrs, scratches, cracks, voids, etc.) that will adversely affect the product performance.

### 3.5.2 Insertion Force

When measured in accordance with EIA-364-13B, 1.5N Max. (Receptacle / Plug)

### 3.5.3 Unmating force

When measured in accordance with EIA-364-13B, the following details shall apply:

0.5N Min. After 30cycles(Receptacle / Plug),

### 3.5.4 Contact Retention Force

Apply axial push force on contact at a constant speed of

25.4 mm / minute. Min. Retention Force for 1.96N / Pin.

### 3.5.5 Durability

When measured in accordance with EIA-364-09C, the following details shall apply:

30 mating cycles at a rate of 10cycles / minute, contact resistance 40mΩ Max\_after test.

### 3.5.6 Vibration

When measured in accordance with EIA-364-28B/MIL-STD-202 method 213b Con.A, the following details shall apply:

Amplitude: 1.5mm P-P

Sweeptime: 10~55~10Hz in 1 minute

Duration: 2 hours in each X.Y.Z axials.

Discontinuity: 1 microsecond max

After test :Contact resistance shall be max 40mΩ

### 3.5.7 Mechanical Shock

When measured in accordance with EIA-364-27B/MIL-STD-202 Method 213b Cond. A, the following details shall apply:

Test pulse: Half sine peak value: 490m/s<sup>2</sup> (50G) duration: 11ms

Discontinuity: 1 microsecond max

After test :Contact resistance shall be max 40mΩ

## 3.6 Electrical Requirements

### 3.6.1 Current Rating: 3.0A

### 3.6.2 Voltage Rating: 300V AC / DC

# PRODUCT SPECIFICATION

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<b>Product Description</b>	4.00mm Board to Board Header Connectors			<b>Page</b>	3		
<b>Doc Number</b>	BJ Series	<b>Prepared By:</b>	ST	<b>Checked By:</b>	AO	<b>Approved By:</b>	VJ

### 3.6.3 Low Level Circuit Resistance

Measured in accordance with EIA-364-06A, Initial:  $\leq 20\text{m}\Omega$ , after environmental test:  $\leq 40\text{m}\Omega$ .

The following details shall apply:

- (a). Current: 10mA Max.
- (b). Max. Open Circuit Voltage: 20mV DC.

### 3.6.4 Dielectric Withstanding Voltage

There shall be of no evidence of flashover when the mated plug and receptacle are tested in accordance with EIA-364-20A, The following details shall apply:

- (a). Voltage: 1700V AC at 50Hz,
- (b). Duration: 60sec,
- (c). Measurement Points: Measure- between adjacent pins, and between pins and solder tags.

### 3.6.5 Insulation Resistance

Shall be a Min. of 1000M $\Omega$  When measured in accordance with EIA-364-21B, the following details shall apply:

- (a). Voltage: 500V DC.
- (b). Measurement Points: Measure between adjacent pins and between pins and solder pegs.

## 3.7 Environmental Requirements

### 3.7.1 Operating Temperature Range

-55°C~105°C. (including temperature rise)

### 3.7.2 Heat resistance

After exposure of the mated connector to a high temperature operating environment, the contact resistance shall not exceed the value specified in paragraph 3.6.3. Test shall be in accordance with MIL STD-202. The following details shall apply:

- (a). Test Condition: 105 $\pm$ 2°C, 96hours.

### 3.7.3 Cold Resistance

After exposure of the mated connector to a low temperature operating environment, the contact resistance shall not exceed the value specified in paragraph 3.6.3. Test shall be based upon EIA-364-105.

The following details shall apply:

- (a). Test Condition: -45 $\pm$ 5°C, 96 hours.

### 3.7.4 Thermal Shock Test

Mate the connector and subject to below condition

The test shall be in accordance with EIA-364-32B, Test Condition a, b:

- (a). Temperature: -55°C/30min to +85°C/30min, 5 cycles.
- (b). After Test: contact Resistance: 40m $\Omega$  Max.

# PRODUCT SPECIFICATION

<b>Part Number</b>	BJ 4.00mm Series	<b>Rev</b>	A	<b>Date</b>	21/08/14		
<b>Product Description</b>	4.00mm Board to Board Header Connectors			<b>Page</b>	4		
<b>Doc Number</b>	BJ Series	<b>Prepared By:</b>	ST	<b>Checked By:</b>	AO	<b>Approved By:</b>	VJ

### 3.7.5 Humidity Test

After exposure of the plug and receptacle to a high humidity environment, the insulation resistance shall not be less than 500 M $\Omega$  and pass the dielectric withstanding voltage test of 1700V AC for 1 minute.

The test shall be in accordance with EIA-364-31A.

- (a). Test Condition: (40 $\pm$ 2 $^{\circ}$ C, 90-95% RH, 96 hrs).

### 3.7.6 Salt Spray

After exposure, the contact resistance shall be max 40m $\Omega$

The test shall be in accordance with EIA-364-26A, The following details shall apply:

- (a). Test Condition: 35 $\pm$ 2 $^{\circ}$ C, 24hrs, 5% NaCL.
- (b). Special Handling: The mated connector shall be mildly rinsed in water to remove salt residue and allowed to dry for 24 hours at room temperature before measurements are to be taken.

### 3.7.7 Resistance to reflow Soldering Heat

There shall be no evidence of physical damage when the unmated connector is subjected to the reflow soldering process.

The following details shall apply:

- (a). Test Condition: Test connector shall be placed on the PCB.
- (b). Pre-Heat Temperature: 150~200 $^{\circ}$ C for 90~120 seconds Max.
- (c). Temperature: Min. 230 $^{\circ}$ C for 30 seconds Max.
- (d). Peak Temperature: 260+0/-5 $^{\circ}$ C, 5~10sec.

### 3.7.8 Resistance to Hand Soldering Heat

There shall be no evidence of physical damage when the unmated connector is subjected to hand soldering.

The following details shall apply:

- (a). Soldering time: 3secs
- (b). Temperature: 350 $^{\circ}$ C

### 3.7.9 Solderability Test

The contact solder tails shall have a minimum of 95% solder coverage after dipped into solder bath. The covered area must not show any evidence of voids or pinholes.

The test shall be in accordance with EIA-364-52, the following details shall apply:

- (a). Solder Dwell Time: Contacts shall be held above the solder for 5 $\pm$ 0.5 seconds before being immersed in the solder.
- (b). Test Temperature : 245 $\pm$ 5 $^{\circ}$ C, 5 $\pm$ 0.5 sec.

# PRODUCT SPECIFICATION

<b>Part Number</b>	BJ 4.00mm Series	<b>Rev</b>	A	<b>Date</b>	21/08/14		
<b>Product Description</b>	4.00mm Board to Board Header Connectors			<b>Page</b>	5		
<b>Doc Number</b>	BJ Series	<b>Prepared By:</b>	<b>ST</b>	<b>Checked By:</b>	<b>AO</b>	<b>Approved By:</b>	<b>VJ</b>

## 4.0 QUALITY ASSURANCE PROVISIONS

### 4.1 Inspection Conditions

Unless otherwise specified, all inspections shall be performed under the following ambient conditions.

- (a) Temperature: 25±5°C.
- (b) Relative Humidity: 30% to 70%.
- (c) Barometric Pressure: Local Ambient.

### 4.2 Qualification Inspection

Qualification inspections shall be performed on sample units produced with production equipment.

#### 4.2.1 Sample Selection

Connectors shall be prepared according to applicable instruction sheets. Samples shall be selected at random from current production. A total of 26 samples are required for the specified test sequence.

#### 4.2.2 Test Sequence

The sample connectors shall be subjected to the inspections specified in the order shown.

Test Item	A	B	C	D	E	F	G	H	I	J
<b>Sample Size</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
Examination of Product	1,6	1,7	1,5	1,10	1,6	1,3	1,3	1,3		
contact Resistance	2,5	2,6	2,4	2,9	2,5					
Insulation Resistance				3,8						
Dielectric Withstanding Voltage				4,7						
Heat resistance					3					
Cold resistance					4					
Humidity Test				5						
Thermal Shock				6						
Solderability						2				
Resist to reflow Soldering Heat							2			
Resist to hand solder heat								2		
Contact Retention Force									1	
Durability		4								
Salt Spray			3							
Insertion Force		3								
withdraw Force		5								
Vibration	3									
Mechanical shock	4									

