

# Product Series Specification Document

sales@gradconn.com  
www.gradconn.com



**PRODUCT SERIES** 1.20mm pitch wire-to-board connectors - Headers  
WB06-DA

## SCOPE

This document covers 1.20mm header connectors. The connector will perform to the specifications outlined. All tests have been performed with the GradConn plug (pin header) connector and the GradConn crimp housing (WB06-DB) connector mated.

## APPLICABLE DOCUMENTS

When releasing this specification, we referenced the most current versions of the following documents. These documents form a part of this specification as described within this document.

Industry Specifications / Standards

UL-94 Flammability

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

EIA Specifications

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



## 1.0 REQUIREMENTS

### 1.1 DIMENSIONAL

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

### 1.2 MATERIAL

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

1.2.1 Contacts: Brass or other equivalent copper alloys.

1.2.2 Insulator: Nylon 6T in flame retardant UL94V-0.

### 1.3 FINISH

1.3.1 Contact Finish: 100 $\mu$ " minimum Matte Tin plated over Nickel 50 $\mu$ " minimum.

### 1.4 DESIGN

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

### 1.5 MECHANICAL REQUIREMENTS

1.5.1 Workmanship:

The product shall be uniform in quality and free from defects that will adversely affect the product performance.

1.5.2 Insertion/Unmating Force:

Pin header and socket mating in accordance with EIA-364-13B.

See Section 3.0 for full list by number of contacts.

1.5.3 Contact Retention Force:

When measured in accordance with EIA-364-29B, The end of a post shall be pushed in a perpendicular to base housing at a constant speed of 25mm $\pm$ 3 mm/minute. Minimum Retention Force for 1.96N/pin.

1.5.4 Vibration:

The connector shall show no evidence of physical damage, contact resistance shall be 20 m $\Omega$  Max., Electrical Discontinuity: 1 microsecond max.

When measured in accordance with MIL-STD-202 Method 201.

(a). Amplitude: 1.5mm P-P

(b). Sweep time: 40-55-10 Hz during one minute.

(c). Duration: 2 hours in each of X, Y and Z axis.

1.5.5 Mechanical Shock:

The connector shall show no evidence of physical damage, contact resistance shall be 20 m $\Omega$  Max., Electrical Discontinuity: 1 microsecond max.

When measured in accordance with MIL-STD-202 Method 213.

(a). 490/s<sup>2</sup> 50G

(b). Three strokes in each of X, Y and Z axis.



## 1.6 ELECTRICAL REQUIREMENTS

### 1.6.1 Current Rating:

When measured in accordance with EIA-364-70.

AWG 28: 1.5A AC/DC maximum based on a 30°C rise over ambient.

AWG 30: 1.0A AC/DC maximum based on a 30°C rise over ambient.

### 1.6.2 Voltage Rating:

50V AC/DC. When measured in accordance with EIA-364-20B.

### 1.6.3 Low-Level Circuit Resistance:

When measured in accordance with EIA-364-06B

Maximum contact resistance 20 mΩ.

The following details shall apply:

(a). Current: 10 mA max.

(b). Maximum Open Circuit Voltage: 20 mV DC.

### 1.6.4 Dielectric Withstanding Voltage:

There shall be of no evidence of flashover when the mated plug and receptacle are tested in accordance with EIA-364-21C. The following details shall apply:

(a). Voltage: 500V AC at 50 Hz.

### 1.6.5 Insulation Resistance:

Shall be a minimum of 100 MΩ. When measured in accordance with EIA-364-21C, the following details shall apply:

(a). Voltage: 500 V DC for 1 min.

(b). Measurement Points: Measure between 10 adjacent and 10 opposing contacts per plug and receptacle.



## 1.7 ENVIRONMENTAL REQUIREMENTS

1.7.1 Operating Temperature Range:  $-25^{\circ}\text{C} \sim 85^{\circ}\text{C}$ .

1.7.2 Temperature Life:

After exposure of the unmated connector to a high-temperature operating environment, the contact resistance shall not exceed the value specified in paragraph 1.6.3.

Test shall be in accordance with JIS C0021/MIL-STD-202 Method 213.

The following details shall apply:

(a). Test Condition:  $85 \pm 2^{\circ}\text{C}$ , 96 hours.

1.7.3 Temperature Rise:

Temperature rise shall be no more than  $30^{\circ}\text{C}$  when rated current is passed, measurement point – contact.

1.7.4 Temperature Cycling:

The connector shall show no evidence of physical damage, contact resistance shall be  $20 \text{ m}\Omega$  max.

The test shall be in accordance with JIS C0025.

(a). Temperature: 5 cycles of  $-25^{\circ}\text{C}$  for 30 minutes and  $+85^{\circ}\text{C}$  for 30 minutes.

(b). Maximum Contact Resistance:  $20 \text{ m}\Omega$  max.

1.7.5 Cold Resistance:

There shall be no evidence of physical damage when the mated module and socket are subjected to extreme cold.

The test shall be in accordance with JIS C0020.

(a). Temperature:  $-25^{\circ}\text{C} \pm 3^{\circ}\text{C}$  for 96 hours.

(b). Maximum Contact Resistance:  $20 \text{ m}\Omega$  max.

1.7.6 Humidity Test:

After exposure of the plug and receptacle to a high humidity environment, the insulation resistance shall not be less than  $100 \text{ M}\Omega$ . The dielectric withstanding voltage shall be greater than  $500 \text{ V AC}$  for 1 minute. The low-level contact resistance shall not exceed the value specified in paragraph 1.6.3.

The test shall be in accordance with EIA-364-31B. Test Condition (a):

(a).  $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ , 90-95% RH, 96 hours.

1.7.7 Salt Spray:

After exposure, the contact resistance shall not exceed that specified (see paragraph 1.6.3). The test shall be in accordance with EIA-364-26B, The following details shall apply:

(a). Gold, Test Condition:  $35^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,  $48 \pm 4$  hours,  $5\% \pm 1\%$  NaCl.

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## 1.7.8 Lead Free Soldering Temperature Profile:

ITEM	LEAD-FREE SOLDERING CONDITION
HAND SOLDERING	350°C±10°C /5sec max.
WAVE SOLDERING	Pre-Heat 100°C/60sec 260°C±5°C /5sec
REFLOW SOLDERING	<p>The graph shows a temperature profile starting from ROOM TEMPERATURE. It rises to 150°C, then to 230°C, and finally to a peak of 260°C. The time spent at 150°C is 120-150 seconds. The time spent at 230°C is 60 seconds. The time spent at the peak of 260°C is 5-10 seconds. The maximum temperature is 260°C.</p>

The peak temperature is 3-5 seconds only.



## 2.0 QUALITY ASSURANCE PROVISIONS

### 2.1 INSPECTION CONDITIONS

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

- (a) Temperature: 25°C±2°C
- (b) Relative Humidity: 30% to 70%
- (c) Barometric Pressure: Local Ambient

### 2.2 QUALIFICATION INSPECTION

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

- 2.2.1 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.

## 3.0 INSERTION/UNMATING FORCE

No of Circuits	Insertion (kfg max.)	Withdrawal (kfg min.)
2	2.0	0.40
3	2.0	0.40
4	2.5	0.40
5	2.5	0.35
6	3.0	0.35
7	4.0	0.20
8	4.0	0.20
9	4.0	0.20
10	5.0	0.15
11	5.0	0.15
12	5.0	0.15
13	5.0	0.15
14	5.0	0.15