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## 1.0 OBJECTIVE

This specification defines the performance, test, quality, and reliability requirements of the Duplex plated Minitek™ Eject Header 2 millimeters centerline.

## 2.0 SCOPE

This specification is applicable to the termination characteristics of the Duplex Plated Minitek™ Header. When mated with FCI Minitek™ IDC Receptacle 2mm centerlines, this product provides board to cable, in vertical two row configurations, THM, PIP and Surface Mount applications.

## 3.0 GENERAL

This document is composed of the following sections.

Paragraph	Title
1.	Objective
2.	Scope
3.	General
4.	Requirements
5.	Applicable documents
6.	Electrical characteristics
7.	Environmental conditions.
8.	Mechanical characteristics

## 4.0 REQUIREMENTS

### 4.1 Qualification


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

### 4.2 Material

4.1.1 Contact. Header pins shall be Phosphor Bronze Alloy C51000, receptacle contact shall be Phosphor Bronze Alloy C52100.

#### 4.1.2 Plastic parts.

- 4.1.2.1 Receptacle housing: Glass filled PBT, UL 94V-0
- 4.1.2.2 Header housing : Glass filled LCP, UL 94V-0
- 4.1.2.3 Header locking latch : Glass filled LCP, UL 94V-0
- 4.1.2.4 Strain relief(optional) : Unfilled PBT

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#### 4.3 Finish

The finish for each part shall be as specified herein. Substitute finishes shall meet the performance requirements of this specification.

4.3.1 Both the header and receptacle contacts shall be plated with GOLD / GXT, with Pure Tin. Minimum of 1.27µm of Nickel under plate all over.

4.3.2 Contact areas: As defined by product drawings, will be plated with the specified thickness

4.3.3 - GOLD / GXT 0.76µm

4.3.4 All other areas will be plated with 1.27µm min of nickel.

#### 4.4 design and construction

The connector system shall be of two-piece design, consisting of : a molded straight, or SMT shielded header having 0.51mm Square header contacts arranged for printed wiring board termination on a 2.0mm square grid; and a multi piece receptacle connector having self-stripping (IDC) contact terminations for flat and flexible round conductor cable 1.0mm pitch.

NOTE: While the receptacle can be mated with any 0.52mm square header contacts, Minimum pin length is 3.0mm Maximum pin length is 4.5mm. Recommended pin length is 4.0mm.

##### 4.4.1 Installation.


4.4.1.1 Header. The header shall mount on printed wire board of any thickness from 0.8mm to 1.6mm, having 0.8mm diameter holes or 4.1mm x 1.0mm pad layout for Surface mount application.

4.4.1.2 Receptacle. The receptacle shall simultaneous terminate up to 50 wires size AWG 26-28(stranded) on 1.0mm centers.

4.4.2 Latching mechanism. A latching mechanism shall be available for locking the plug into the receptacle to withstand service conditions without disconnecting and help to disconnect the connectors without any tools.

4.4.3 Strain relief . An optional strain relief shall be available to protect the receptacle terminations against pull and flexing forces.

4.4.4 Polarizing feature. An optional molded-in polarizing feature shall be available to insure correct orientation of the receptacle connector and its mating header.

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4.4.5 Mating. The connector shall be capable of mating and unmating by hand without the use of special tools within the specified temperature.

## 5.0 APPLICABLE DOCUMENTS

### 5.1 Specifications

- 5.1.1 Engineering drawings
- 5.1.2 Process drawings

### 5.2 Standards & Specifications


- 5.2.1 UL94 Tests for flammability of plastic materials
- 5.2.2 EIA-364

### 5.3 FCI specifications

- 5.3.1 DPS-12-011 Minitex II Connectors Product specifications
- 5.3.2 BUS-12-115 Minitex IDC
- 5.3.3 GS-22-011 Pb free Solder heat resistance procedure- convection oven reflow
- 5.3.4 GS-22-012 Pb free Solder heat resistance procedure – wave solder
- 5.3.5 GS-20-061 Product storage-Solder ability
- 5.3.6 GS-22-013 Lead free Plastic evaluation Process for soldering Process suitability.

## 6.0 ELECTRICAL CHARACTERISTICS

- 6.1 Current rating. the maximum current rating of the connector shall be 1 ampere AC or DC.
- 6.2 Contact resistance. The contact resistance shall not exceed 12 milliohms initially (15 milliohms after environment exposure when measured in accordance with EIA-364-06.
  - a) Method of connection: attach current and voltage leads as shown in fig 1.
  - b) Test current 1.0 ampere DC.
- 6.3 Low level circuit resistance. The low level circuit resistance shall not exceed 12 milliohms (15 milliohms after environment exposure.
- 6.4 Operating temperature range : -40°C to 125°C including temperature rise caused by application of current)

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6.5 Insulation resistance The insulation of the mated connector shall be not less than 1000 mega ohms after exposure to humidity, when measured in accordance with EIA-364-21. The following details shall apply

- a. Test voltage: 500 Volts DC
- b. Special preparation: the header and receptacle shall not be mated.
- c. Points of measurement: Between adjacent pins.

6.6 Dielectric Withstanding Voltage – There shall be no evidence of arc-over, insulation breakdown or excessive leakage current (> 1milliampere) when the unmated connector is tested in accordance with MIL-STD-202 method 301. The following details shall apply:


- a. Test voltage: 650 Volts ( DC,RMS or AC, 60Hz)
- b. Test duration: 60 seconds
- c. The connectors are unmated.
- d. Points of measurement: Between adjacent pins.

## 7.0 Mechanical Characteristics

7.1 Total mating force. The total force to mate the header and receptacle shall not exceed the values shown in table 1.

TABLE 1 – TOTAL INSERTION FORCE

Contact population	Force / Newton's
2x3	13.0
2x4	23.0
2x5	26.0
2x6	29.0
2x7	31.0
2x8	34.0
2x9	36.0
2x10	39.0
2x12	44.0
2x13	47.0
2x15	52.0
2x17	57.0
2x20	65.0
2x22	70.0
2x24	75.0
2x25	78.0

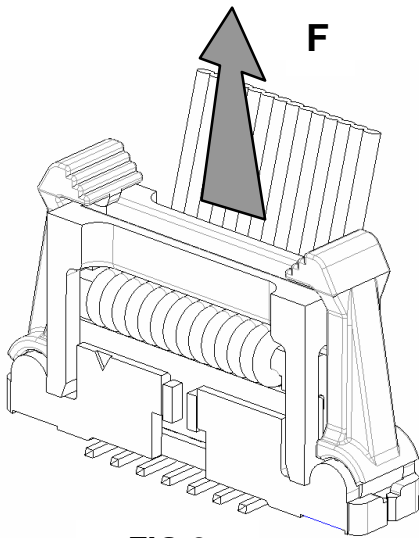
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7.2 Receptacle retention The receptacle when locked on the header shall withstand an evenly distributed pull out axial force of 1.6N per contact as shown in figure 2.

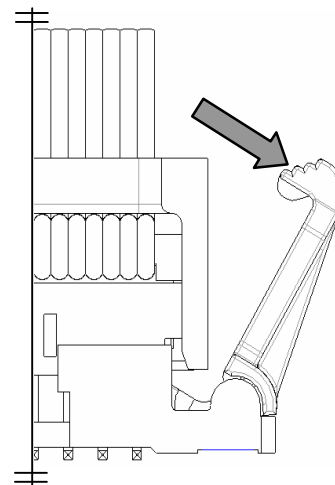
7.3 Locking latch resistance The locking latch shall withstand a force of 30N MIN when applied as show on fig 3

7.4 Cable flex resistance The strain relief on the receptacle mated with the eject header shall withstand 50 cycles of cable flexing when tested with stranded wire. The following details apply.

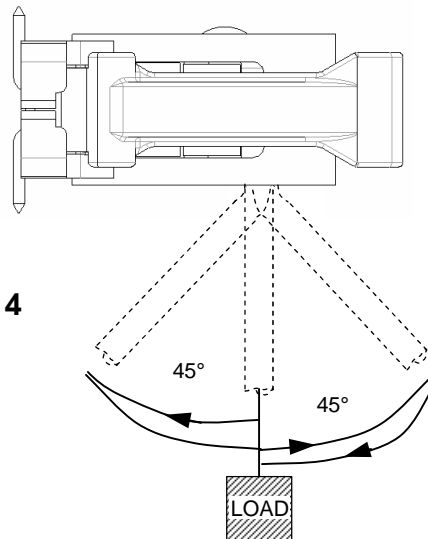
- a) Flex angle :  $\pm 45^\circ$  ( see fig 4)
- b) Fixed loaded: 0.5N per conductor.




**FIG 2**



**FIG 3**



**FIG 4**

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## 8.0 Environmental Conditions

After exposure to the following conditions in accordance with the specified test procedure and details, the connector will show no physical damage.

### 8.1 Thermal shock – MIL-STD-202, Method 107G.

- a. Test conditions:
- b. Temperature range: -55°C to +125°C
- c. Time at each temperature: 30 minutes.
- d. Transfer Time: 5 minutes maximum.

### 8.2 Humidity – MIL-STD-202, Method 103B

- a. Temperature: +40°C
- b. Relative humidity: 95%
- c. Test duration: 96 Hours

### 8.3 Solder ability – FCI BUS-19-002 - MIL-STD-202, Method208F

- a. Steam aging: 4 hours
- b. Contact areas evaluated shall meet the method 208 requirements


### 8.4 Resistance to solder heat for Pb Free headers

- a. GS-22-012 wave solder 260°C
- b. GS-22-011 / 5.4.2 reflow 245°C
- c. GS-22-011 / 5.4.3 reflow 260°C

### 8.5 Infrared Reflow for SMD and PIP Pb free Headers

There shall be not evidence of physical damage after reflow.

- a. Peak temperature: 260°C +0/-5°C for volume <350mm<sup>3</sup> to >2000mm<sup>3</sup> and package thickness <1.6mm ( ref to JEDEC J-STD-020D)
- b. Time: 20-40 sec maximum
- c. Others package and volume to be subjected to Peak temperature 245°C +0/-5°C / 10-30 sec.

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REVISION RECORD

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