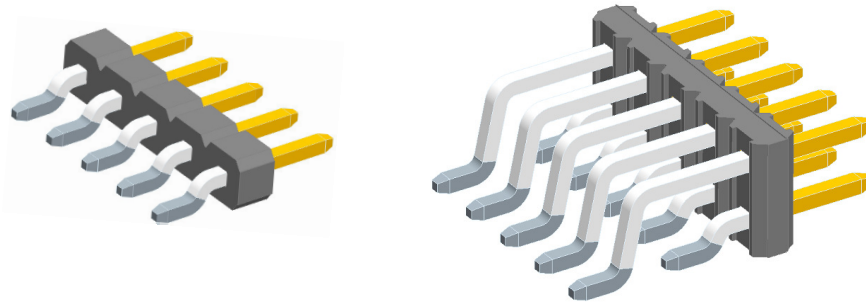
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1.0 OBJECTIVE

This specification defines the performance, test, quality, and reliability requirements of the Minitek™ Header 2.0 millimeters centerline SMT R/A.

2.0 SCOPE

This specification is applicable to the termination characteristics of the Minitek™ Header, when mated with FCI Minitek™ terminals or other 0.51mm pin compatible receptacles, 2mm centerline. This product provides board to board, board to cable, board to discrete wire capabilities in horizontal one or two row configurations.



3.0 REQUIREMENTS

3.1 MATERIAL

3.1.1 Pins: Pins shall be Phosphor Bronze Alloy UNS C51000 drawn wire in accordance with ASTM B159

3.1.2 Insulator: High temperature Glass-filled polymer with a flame retardant rating of UL-94-V0

3.2 FINISH

The finish of the pins shall be as specified herein.

3.2.1 Solder tails: 2-6µm pure matte Tin over 1.27µm nickel MIN under plating.

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

Class II -


- 0.76µm Gold/GXT over 1.27µm nickel MIN under plating.

Class III

- Gold flash over 1.27µm nickel MIN under plating
- 2µm MIN full Tin MIN over 1.27µm nickel MIN under plating

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

3.3 DESIGN AND CONSTRUCTION

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Connectors shall be of the design, construction and physical dimensions specified on the applicable product drawings 10118684 for single row & 10118690 for double row.

4.0 **APPLICABLE DOCUMENTS**

4.1 Specifications

- 4.1.1 Engineering drawings
- 4.1.2 Process drawings

4.2 Standards & Specifications

- 4.2.1 UL94 Tests for flammability of plastic materials
- 4.2.2 EIA-364

4.3 Others FCI specifications

- 4.3.1 DPS-12-011 Minitex II Connectors Product specifications
- 4.3.2 GS-22-011 Pb free Solder heat resistance procedure- convection oven reflow
- 4.3.3 GS-22-060 Product Shelf life-Storage-Solderability
- 4.3.4 GS-20-061 Product storage-Solderability
- 4.3.5 GS-22-013 Lead free Plastic evaluation Process for soldering Process suitability.

5.0 **ELECTRICAL CHARACTERISTICS**

5.1.1 The Maximum current rating of the header pin shall be 3A at 60°C ambient temp

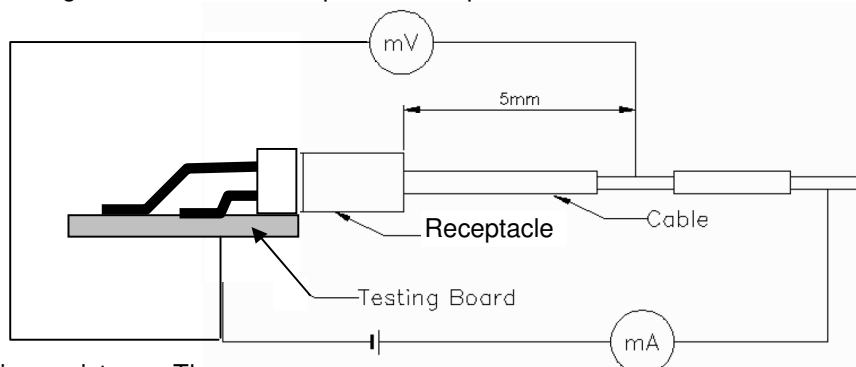
5.2 Voltage rating: 200 Volts

5.3 Operating temperature range : -55°C to 125°C including temperature rise caused by application of current.


5.4 Contact resistance ;

Then contact resistance shall not exceed 15 mΩ before test or 20mΩ after test when measured under the following conditions:

- a. Method of connection : see figure below
- b. Test current: 10 mA DC.
- c. Open circuit voltage : 20mV DC
- d. Mounting conditions : with FCI product receptacle 77138, 10044403, 55510 or 63453



5.5 Insulation resistance Th an 1000 MΩ when measured in accordance with MIL-STD-202, Method 302. The following details shall apply

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- a. Test voltage: 500 Volts DC
- b. Time: 2 minutes
- c. Points of measurement: Between adjacent pins.

5.6 Capacitance

The capacitance measured as per MIL-STD-202, method 305 shall not exceed 2.0 pF at the specified frequency. The following details shall apply:

- a. Frequency : 1 KHz
- b. Polarization: N.A.
- c. Mounting conditions : uncounted, unmated
- d. Adjacent contacts : yes
- e. No of measures : 8 adjacent positions/connector

5.7 Temperature rise

The temperature rise shall not exceed 30°C when measured using thermocouple under the following conditions:

- a. Current applied : 2A DC
- b. Special preparation : The connector shall be connected in series.
- c. Point of thermal measure: at a terminal located at or near middle of the connector.
- d. Mounting conditions : with FCI product receptacle 77138, 10044403, or 55510.

5.8 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 EIA-364-20. 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.

6.0 ENVIRONMENTAL CONDITIONS


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

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

Test conditions:

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

6.2 Humidity – MIL-STD-202, Method 103B

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

6.3 High temperature life –MIL-STD-202, Method 108A

- a. Test Temperature: 125°C
- b. Test duration: 288H

6.4 Solderability – GS-19-037 - MIL-STD-202, Method208F

- a. Test version “D” section 4.3
- b. Test version “E” section 4.4

6.5 Hydrogen sulfide (H₂S) exposure

There should be no evidence of cracking, swelling or other damage which would be detrimental to the function of the connector and the contact resistance shall not exceed 20mΩ after the mated connector is exposed to the moist H₂S environment.

The following conditions shall apply :

- a. Ambient temperature : 40°C
- b. Relative humidity : 70 to 80% RH
- c. H₂S density : 10 ±5 ppm
- d. Test duration: 96 Hours

6.6 Salt spray

There should be no evidence of cracking, swelling or oxidation which would be detrimental to the function of the connector and the contact resistance shall not exceed 20mΩ after the mated connector is exposed to a salt fog ambience in accordance with MIL-STD-202, Method 101D.


The following conditions shall apply :

- a. Duration: 48 Hours
- b. Ambient temperature : 35°C
- c. Salt concentration : solution 5% weight
- d. Specific treatment: The measurement shall be conducted after the mated conductor is mildly rinsed in running water to remove deposition of salt, followed by natural drying by placing it for 24 hours at room temperature.

6.7 Resistance to solder heat for Pb Free connectors

- a. GS-22-012
- b. GS-22-011 / 5.4.3 reflow 260°C

7.0 MECHANICAL CHARACTERISTICS

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7.1 Vibrations

There should be no evidence of physical or mechanical damage, or disassociation of parts, and no evidence of discontinuity greater than 1 micro second then the mated connector is subjected to mechanical vibration. The contact resistance shall not exceed 20mΩ after the tests. The test shall be in accordance with MIL-STD-202, method 201A, following conditions shall apply:

- a. Frequency : 10-55-10 Hz/min
- b. Amplitude : 1.5mm MAX
- c. Test current : 0.1 A
- d. Duration : 2 hours along each of 3 perpendicular main directions (6 hours total)
- e. Mounting conditions : with FCI product receptacle 77138, 10044403 or 55510

7.2 Mechanical shock

There should be no evidence of physical or mechanical damage, or disassociation of parts, and no evidence of discontinuity greater than 1 micro second then the mated connector is subjected to mechanical shock. The contact resistance shall not exceed 20mΩ after the tests. The test shall be in accordance with MIL-STD-1344, method 2004, test conditions A. Following conditions shall apply:

- f. Peak value : 50g
- g. Duration : 11 ms
- h. Wave form : Half Sinusoidal
- i. Velocity : 0.057 m/s
- j. No of shock : 3 shocks per each of 3 perpendicular main directions (18 total)
- k. Mounting conditions : with FCI product receptacle 77138, 10044403 or 55510

7.3 Mating-unmating

When the connector is subjected to 20 cycles of mating/unmating operation in accordance with MIL-STD-1344, method 2013, insertion and withdrawal forces shall conform to the following requirements at initial, 10th and 20th cycles.

- a. Insertion force : 2 N MAX per individual pair (one pin with one contact receptacle)
- b. Withdrawal force : 0.2 N x pos MIN

The following conditions may apply:

- a. Mounting conditions : with FCI product receptacle 77138, 10044403 or 55510
- b. Test rate : 25.4mm / min
- c. The test samples are fastened to the base plate of the stand and applicable force gauge.
- d. The fastening device has to ensure axial self alignment with receptacle sample.

7.4 Durability

Contact resistance after 100 cycles of mating/unmating operation as per test §7.3 shall not exceed 20mΩ



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Table I – qualification testing

		TEST GROUPS										
		1	2	3	4	5	6	7	8	9	10	11
Samples at PCB test.			6			6	6	6	6	6	6	
Samples free		3		3	3							3
TEST	§	TESTS SEQUENCE										
Examination of products		1,4,6,8	1,6	1,3	1,3	1,5	1,3	1,3	1,3	1,3	1,3	1,3
Contact resistance	5.4		3			4	4	4		4	4	
Insulation Resistance	5.5	2	4									
Capacitance	5.6		2									
Temperature rise	5.7			2								
Dielectric withstanding voltage	5.8	3	5									
Thermal shock	6.1	5										
Humidity, steady state	6.2	7										
High temperature life	6.3				2							
Solderability	6.4											2
Hydrogen sulfide exposure	6.5						2					
Salt spray exposure	6.6							2				
Solder heat withstanding	6.7								2			
Vibrations	7.1									2		
Mechanical shock	7.2										2	
Mating / unmating	7.3					2						
Durability	7.4					3						

Revision record

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A	ALL	RELEASED	F11-0005	11 Jan 11