

NUMBER <b>DPS-12-011</b>	CATEGORY <b>PRODUCT SPECIFICATION</b>	<b>Amphenol ICC</b>	
TITLE <b>MINITEK II CONNECTOR</b>		PAGE 1 of 8	REVISION J
		GUARDIAN (VERIFIED BY) Yuan-Yuan Bao	DATE Mar 11 20
		APPROVED BY Tim Yao	
		CLASSIFICATION : <b>UNRESTRICTED</b>	

## 1.0 OBJECTIVE

This specification defines the performance, test, quality and reliability requirements of the Minithek 2.0 product.

## 2.0 SCOPE

Minithek II connector is a double rows, vertical card connector designed for used on 2.0mm center to center holes and available in vertical and right angle applications. This specification is intended to cover the performance and evaluation conditions of the connector.

## 3.0 APPLICABLE DOCUMENTS

Standards and Specifications:

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

## 4.0 MATERIAL AND FINISH

### 3.1 Receptacle Terminal

Material: Phosphor Bronze.

Finish : Overall 1.27 um Min Nickel under-plated

Solder tail – (a) Tin/Lead (85/15) plating

(b) Matte Tin

(c) Au or GXT

Contact area – (a) Matte Tin

(b) Au or GXT

### 3.2 Receptacle Housing

a) Material: Glass-Filled PBT; Color: Black; Flammability: UL 94V-0.

b) Material: Glass-Filled PCT; Color: Beige / Black; Flammability: UL 94V-0.

c) Material: Glass-Filled PA4T; Color: Black; Flammability: UL 94V-0.

d) Material: Glass-Filled PA9T; Color: Nature/Black; Flammability: UL 94V-0.

### 3.3 Header Pin

Material: Phosphor Bronze or Brass.

Finish : (a) Matte Tin over 1.27 um Nickel under-plated;

(b) Au or GXT plating over 1.27um nickel

### 3.4 Header Body

a) Material: Glass-Filled Nylon 66; Color: Black; Flammability: UL 94V-0.

b) Material: Glass-Filled PCT; Color: Beige / Black; Flammability: UL 94V-0.

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- c) Material: Glass-Filled PA4T; Color: Black; Flammability: UL 94V-0.
- d) Material: Glass-Filled PA9T; Color: Nature / Black; Flammability: UL 94V-0.

## 5.0 REQUIREMENTS

5.1 Rating Voltage: 200V, AC/DC

5.2 Rating Current: 2A, AC/DC

5.3 Operating Temperature Range : -40°C to 105°C (For Nylon 6,6 & PBT material) -55°C to 125°C (For PCT material) (including temperature rise caused by application of current)

## 6.0 PERFORMANCE

Unless otherwise specified, when tested under the ambient conditions in accordance with JIS-5020 as described below and evaluated with the sequence listed in Table 1, the connector shall meet the requirements in Para. 3.5.

- a) Temperature : 5°C to 35°C
- b) Relative Humidity : 45 to 85%
- c) Atmospheric Pressure : 860 to 1060 mb

### 6.1 Electrical Characteristics

#### 6.1.1 Contact Resistance

The contact resistance shall not exceed 20 mΩ before test or 25mΩ after test when measured under the following conditions in accordance with EIA-364-23:

- a) Method of connection: See Figure 1.
- b) Test current : 10mA DC.
- c) Open circuit voltage: 20mV DC.

#### 6.1.2 Insulation Resistance

The insulation resistance of the unmated connector shall not be less than 1000MΩ when measured in accordance with EIA-364-21, the following details shall apply:

- a) Test voltage: 500V DC for 1 minute
- b) Special preparation: The connector shall not be mounted on PCB.
- c) Points of measurement: Between adjacent terminals.

#### 6.1.3 Dielectric Withstanding Voltage

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There shall be no evidence of arc-over or insulation breakdown when the unmated connector is tested in accordance with EIA-364-20. The following details shall apply:

- a) Test voltage: 650V AC for 1 minute
- b) Special preparation: The connector shall not be mounted on PCB.
- c) Points of measurement: Between adjacent terminals.

#### 6.1.4 Temperature Rise

The temperature rise shall not exceed 30°C when measured using thermocouple under the following conditions in accordance with EIA-364-70:

- a) Current applied: 2A DC
- b) Special preparation: The connector shall be connected in series..
- c) Points of measurement: At a terminal located at or near the middle of the connector.

### 6.2 Environmental characteristics

#### 6.2.1 High Temperature Life

There shall be no evidence of cracking, swelling or other damage which would be detrimental to the function of the connector. The contact resistance shall not exceed 25mΩ after the mated connector is exposed to a high temperature environment in accordance with EIA-364-17. The following details shall apply:

- a) Ambient Temperature : 105 +/- 2°C.
- b) Duration: 44 hours.

#### 6.2.2 Humidity

There shall be no evidence of cracking, swelling or other damage which would be detrimental to the function of the connector after the mated connector is exposed to a high humidity ambience in accordance with EIA-364-31. The contact resistance shall not exceed 25mΩ and insulation resistance shall not be less than 100mΩ .

The dielectric withstanding voltage test shall be performed after the humidity test and the connector shall meet the requirements described in Para. 6.1.3. The following details shall apply:

- (a) Ambient Temperature: 40 +/- 2°C.
- (b) Duration: 96 hours.
- (c) Relative humidity: 90 to 95%

#### 6.2.3 Salt spray

There shall 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 25mΩ after the mated connector is exposed to a salt fog ambience in accordance with EIA-364-26. The following details shall apply:

- a) Salt Solution: 5% by weight.

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- b) Ambient temperature : 35°C.
- c) Duration: 48hours.
- 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.

#### 6.2.4 Thermal shock

There shall be no evidence of cracking, swelling or other damage which would be detrimental to the function of the connector after the mated connector is exposed to alternate cycles of extreme high and low temperature in accordance with EIA-364-32. The contact resistance shall not exceed 25mΩ. The following details shall apply:

- a) Temperature range: -55°C +0°C/-3°C for 30 minutes  
followed by 85°C +3°C/-0°C for 30 minutes.
- b) Number of cycles: 5 cycles.

#### 6.2.5 Hydrogen sulfide (H2S) exposure

There shall 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 25mΩ after the mated connector is exposed to a moist H2S environment. The test shall be in accordance with IEC60068-2-43, and the following details shall apply:

- a) Ambient temperature: 40°C.
- b) Relative humidity: 70 to 80%
- c) H2S density: 10+/- 5PPM.
- d) Duration: 96 hours.

### 6.3 Mechanical characteristics

#### 6.3.1 Vibration

There shall be no evidence of physical or mechanical damage, or disassociation of parts, And no evidence of discontinuity greater than 1 microsecond when the mated connector is subjected to mechanical vibration. The contact resistance shall not exceed 25mΩ after the test. The test shall be in accordance with EIA-364-28, and the following details shall apply :

- a) Frequency: 10-55-10 Hz/Min, sweep vibration.
- b) Amplitude: 1.5mm Max.
- c) Test current: 0.1A.
- d) Duration: 2 hours along each of three perpendicular axes (6 hours total).
- e) Mounting : See figure 2.

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### 6.3.2 Contact retention fore (Receptacle)

Each contact retention force shall be more than 0.2kgf when the solder leg is pushed along axial direction at the speed of 25mm/min. The test shall be in accordance with EIA-364-29.

### 6.3.3 Post retention force (Header)

Pin retention force shall be more than 0.5kgf in either direction at the speed of 25mm/min. The test shall be in accordance with EIA-364-29.

### 6.3.4 Mating / Unmating force

When the connector is subjected to 20 cycles of mating/unmating operation, insertion and withdrawal forces shall conform to the following requirements st initial, 10th and 20th cycles, the test shall be in accordance with EIA-364-13.

- a) Insertion force : 180g x Pos. Max.
- b) Unmating force : 20g x Pos. Min.

### 6.3.5 Durability

The test shall be in accordance with EIA-364-09. Contact resistance after 100 cycles of mating/unmating operation shall not exceed 25mΩ.

### 6.3.6 Solderability

The test shall be applied to solder leg of both contact and post. No less than 90% of the dipped surface of the solder leg is dipped in solder bath. The test shall be in accordance with J-STD-002, and the following details shall apply:

- a) Flux: Alpha 100, GX-5 or GX-7.
- b) Solder: 60-40 Tin/Lead.
- c) Flux immersion time: 5 to 10 seconds.
- d) Solder temperature: 230°C +/- 5°C.
- e) Dipping time: 3+/-0.5 seconds.

### 6.3.7 Solder heat resistance

The test shall be applied to solder leg of both contact and post. There shall be no evidence of physical damage detrimental to the function of the connector when each solder leg of the connector mounted onto a PCB is dipped in a bath. The test shall be in accordance with EIA-364-56, and the following details shall apply:

- a) Solder temperature : 260°C +/-5°C.
- b) Dipping time: 5+/-0.5 seconds.
- c) Immersion depth: The end of the solder leg coming through the PCB.

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CONTACT RESISTANCE

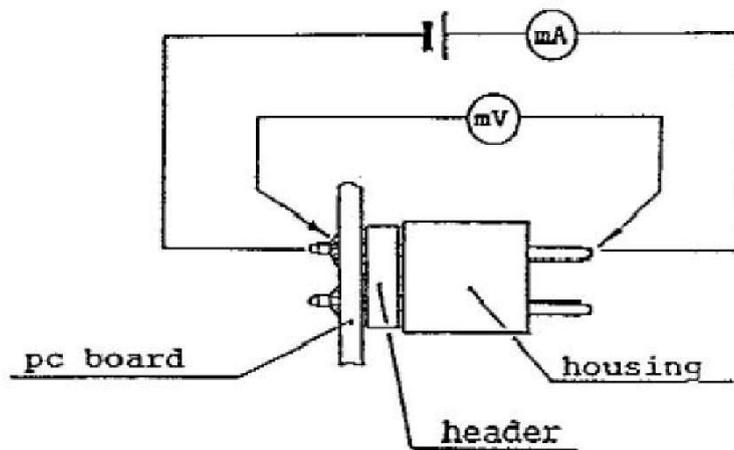


Fig. 1

VIBRATION

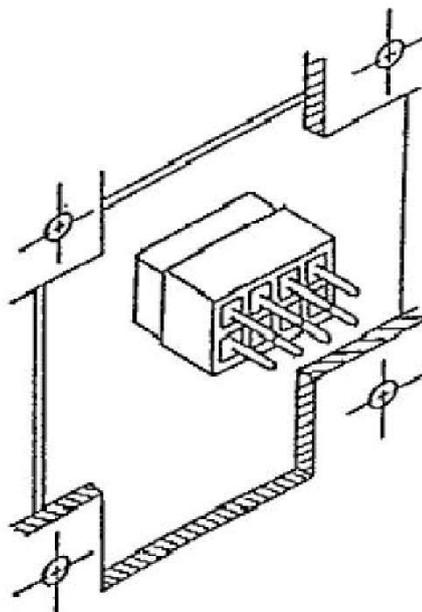


Fig- 2

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### 7.0 QUALIFICATION TEST MATRIX

Items	Test Group											
	#1	#2	#3	#4&5	#6	#7	#8	#9&10	#11&12	#13	#14	
Visual Inspection	1,7	1,3	1,5	1,7	1,5	1,5	1,5	1	1,6	1,3	1,3	
Low Level Contact Resistance(LLCR)			2,4	2,4,6	2,4	2,4	2,4		2,5			
Insulation Resistance(IR)	2,5											
Dielectric Withstanding Voltage(DWV)	3,6											
Current Rating		2										
High Temperature Life			3									
Humidity	4			5								
Salt spray					3							
Thermal Shock				3								
Hydrogen Sulfide Exposure						3						
Vibration							3					
Contact Retention Force								2				
Post Retention Force								3				
Mating/Un-mating Force									3			
Durability									4			
Solderability										2		
Resistance to Solder Heat											2	
Sample Size	Header (PCS)	3	3	3	3	3	3	3+3	3	3	3	3
	Rec. (PCS)	3	3	3	3	3	3	3+3	3	3	3	3

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**8.0 RECORD RETENTION (IF APPLICABLE)**

REV	PAGES	DESCRIPTION	EC #	DATE
A	01	/	S00028	23 APR 90
B	06	/	S00244	02 OCT 90
C	02	/	V12369	22 AUG 91
D	01	/	S10307	AA SEP 91
E	07	/	S20204	29 JUL 92
F	02	/	S30339	22 SEP 93
G	01	/	S04-0259	02 DEC 04
H	ALL	/	S06-0334	06 OCT 06
J	ALL	1. Change the test method from MIL to EIA, J-STD or IEC. 2. Correct some mistakes 3. Update the test matrix	ELX-N-36251	02 MAR 20