

108-5014

NUMBER

Customer Release

AMP SECURITY CLASSIFICATION

108-5014

Product Specification

2.36 ϕ Pin Receptacle for Multi/Single Circuit Connector

1. Scope:

1.1 Scope:

This specification covers general requirements for multi/single circuit pin receptacle which is designed to mate with the 2.36mm ϕ pin contact mounted on the printed circuit board (hereafter called P.C.B.).

1.2 Handling Method Instructions:

- (A) When to mate the receptacle contacts accommodated in the housing, with the pin contacts mounted on P.C.B., the housing shall be not forced to be prized.
- (B) When to unmate the receptacle contacts accommodated in the housing, from the pin contacts mounted in P.C.B., the housing shall be not forced to be prized.

2. Applicable Product Part Numbers:

The following part numbers are covered under this product specification.

Pin Receptacle Contact : 170073-2, -5, -6, -7
 Housing Blocks : 171111-1 (Single-Pole), 171108-2 (3-Pole)
 170906-2 (4-Pole)

3. Applicable Pin Dimensions:

3.1 The pin dimensions shall conform to those shown in Figure 1.

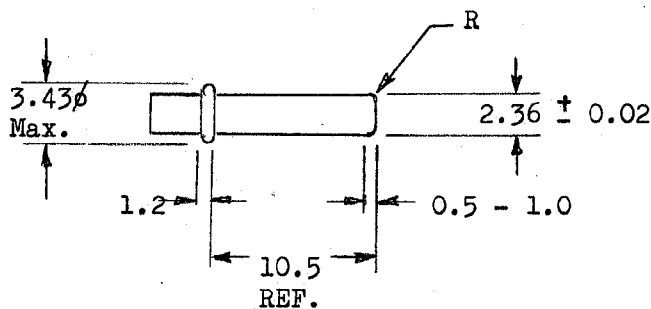


Figure 1

Unit: mm

3.2 Pin Material and Surface Finish:

Pins shall be made of formed brass and uniformly nickel-plated all over.

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| | | DR | <i>M. Yamada</i> 1-10-74 | | AMP | AMP (Japan), Ltd. | | REV |
| | | CHK | | | | TOKYO, JAPAN | | |
| PRINT DIST | C ₁ | Revised RFA-1938 | | | LOC | NO | 108-5014 | C ₁ |
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| | B | Retyped | <i>[Signature]</i> 1-10-74 | SHEET | | NAME | | |
| LTR | REVISION RECORD | | DR | CHK | DATE | Product Specification | | |
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3.3 Status of Pin Mounted on P.C.B.

The status of pin mounted on P.C.B. shall be such that the pins are firmly attached onto P.C.B. in perpendicular to "Y" axis center line, along which distances of 10mm, 18mm and 26mm are spaced for positioning contact pins as shown in Figure 2. The tolerance of the pin to the true position covering from the root to the pin top shall be 0.15mm maximum when the pin in 2.38φ is applied. This tolerance includes the values of pin aberration from the true position, warpage of P.C.B. and bending of pin contact.

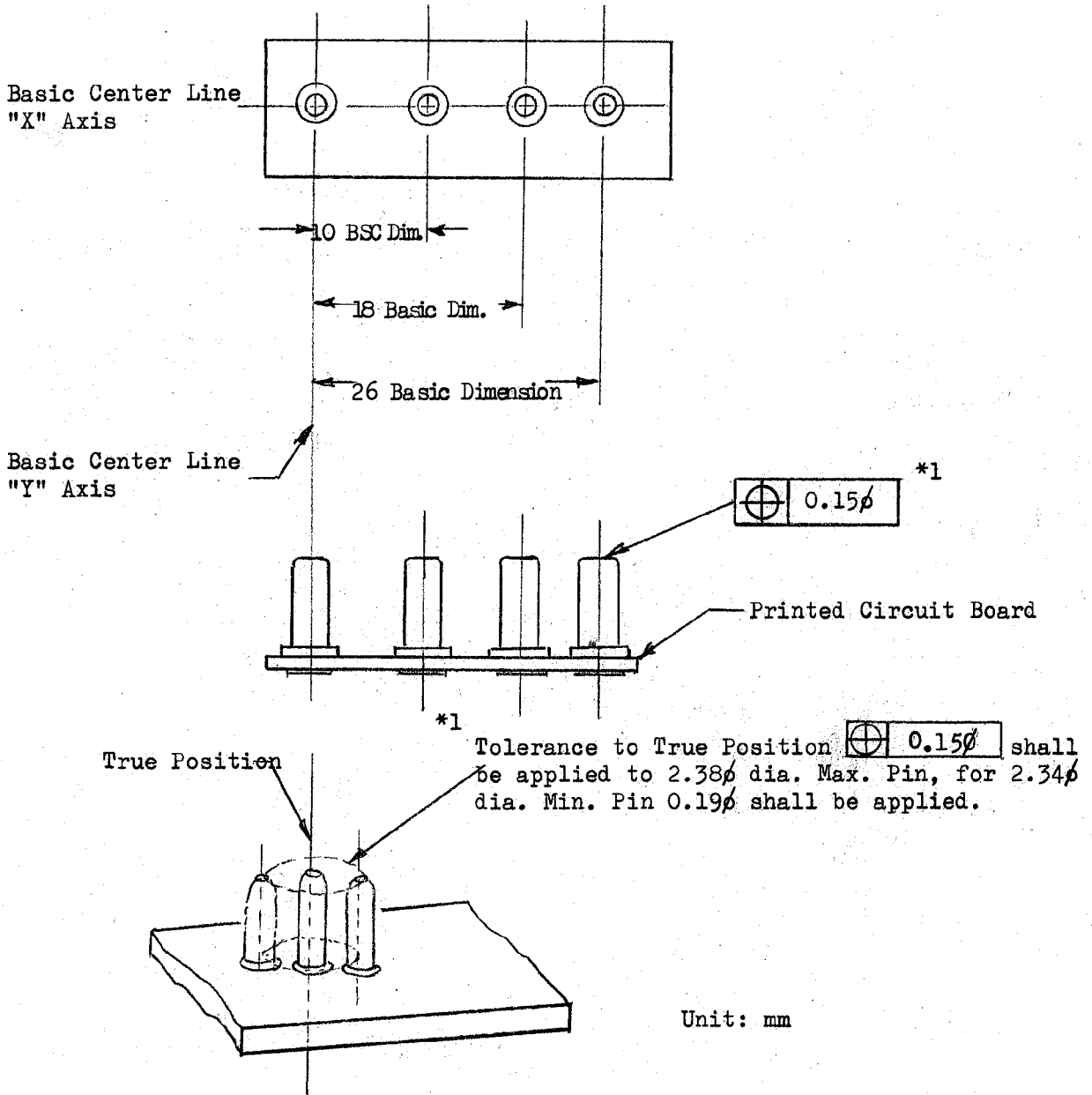


Figure 2

| | | | | | |
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4. Contact:

4.1 Material:

The material used to fabricate the contact shall be brass conforming to ASTM B36 COPPER ALLOY #260 and MIL-C-50.

4.2 Design Feature and Dimensions:

The design feature and dimensions shall be conforming to the applicable product drawings.

4.3 Finish:

The product shall be surface finished according to the applicable product drawings.

4.4 Applicable Wire Range:

4.4.1 The wire applied to this product shall be in accordance with the specifications shown in Table 1.

| Nominal Cross-Sectional Area(mm ²) | Strands Composition | | Cross-Sectional Area(mm ²) | A W G |
|--|---------------------|-------------------|--|-------|
| | Strand Diameter | Number of Strands | | |
| 0.2 | 0.18 | 7 | 0.18 | 24 |
| 0.3 | 0.18 | 12 | 0.31 | 22 |
| 0.5 | 0.18 | 20 | 0.51 | 20 |

Table 1

4.4.2 The applicable insulation diameter shall be within the range of 1.52-2.79mm.


5. Housing:

5.1 Housing Material:

The housing material shall be NORYL resin, conforming to the Grade SE-1 of UL Subject 94.

5.2 Design Feature and Dimensions:

The design feature and dimensions shall be conforming to the applicable product drawings. The multi-pole housings shall have the contact cavities in line with the center distance of 8mm respectively except that the one cavity distance in the end only shall align in 10mm centering to form a construction to prevent connector mismatching. The housings shall have a flange on the mating end for ease of insertion and extraction.

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6. Product Performance:

6.1 Electrical Performance:

6.1.1 Termination Resistance:

When tested in accordance with the test method specified in Para. 7.3.1, the termination resistance per contact shall be not greater than 3mΩ.

6.1.2 Contact Resistance (Mating Surface):

When tested in accordance with the test method specified in Para. 7.3.1, the contact resistance per pole shall be not greater than 5mΩ.

6.1.3 Insulation Resistance:

When tested in accordance with the test method specified in Para. 7.3.2, the insulation resistance between adjacent terminals and between the terminals and ground shall be not less than 1000MΩ.

6.1.4 Dielectric Strength:

When tested in accordance with the test method specified in Para. 7.3.3, no evidence of abnormalities shall appear on the connector assembly when commercial power frequency AC 1000V is applied between adjacent terminals and between the terminals and the ground for 1 minute.

6.2 Mechanical Performance:


6.2.1 Connector Insertion Force:

When tested in accordance with the test method specified in Para. 7.3.4, the connector insertion force shall be not exceeding 1.5kg (3.3 lbs) for 1-pole connector, not exceeding 5.0kg (11 lbs.) for 3-pole and not exceeding 6.0kg (13.2 lbs.) for 4-pole connector.

6.2.2 Connector Extraction Force:

When tested in accordance with the test method specified in Para. 7.3.5, the connector extraction force shall meet the following requirements.

- (1) When the receptacle contacts of Cat. Nos. 170073-2, -5 & -6 are used, the extraction force shall be within the ranges of 0.30-1.5kg for 1-pole, 0.90-4.5kg for 3-pole and 1.30-5.0kg for 4-pole connector.
- (2) When the receptacle contacts of Cat. No. 170073-7 are used, the extraction force shall be in the ranges of 0.45-1.50kg for 1-pole, 1.35-4.50kg for 3-pole and 1.8-5.0kg for 4-pole connector.

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6.2.3 Contact Extraction Force:

When tested in accordance with the test method specified in Para. 7.3.6, the contact extraction force shall meet the following requirements.

- (1) When the receptacle contacts of 170073-2, -5 & -6 are used the extraction force shall be not less than 300g (10.58 oz.), and not less than 100g (3.53 oz.) after 10 repeated cycles of insertion/extraction.
- (2) When the receptacle contact of 170073-7 are used, the initial extraction force shall be not less than 450g (1 lb.) and not less than 200g (7.05 oz.) after 10 repeated cycles of insertion/extraction.

6.2.4 Contact Retention Force:

When tested in accordance with the test method specified in Para. 7.3.7, the contact retention force in the connector housing shall be not less than 4kg (8.81 lbs.) per contact.

6.2.5 Crimp Tensile Strength:

When tested in accordance with the test method specified in Para. 7.3.8, the crimp tensile strength shall be not less than the values specified in Table 2. For the wire strand composition, refer to Table 1.

| Wire Size (Nominal) | | Tensile Strength | |
|----------------------|-------|------------------|-------|
| Cross-sectional Area | | kg | lbs. |
| (mm ²) | (AWG) | | |
| 0.2 | (#24) | 3.0 | 6.61 |
| 0.3 | (#22) | 6.0 | 13.21 |
| 0.5 | (#20) | 8.0 | 17.62 |

Table 2


6.3 Ratings:

6.3.1 Temperature Rating:

The temperature rating of this product shall be 75°C maximum.

6.3.2 Voltage Rating:

The voltage rating of this product shall be 250V maximum.

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6.3.3 Current Rating:

The current rating of this product shall be as those specified in Table 3.

| Wire Size (Nominal) mm ² (AWG) | Continuous Current Rating Maximum (A) | Condition |
|--|--|---------------------------------------|
| 0.2 (#24) | 6.5 | Ambient Temperature 30°C (86°F) |
| 0.3 (#22) | 8.0 | |
| 0.4 (#21) | 9.0 | |
| 0.5 (#20) | 10.0 | |

Table 3

7. Quality Assurance Provisions:

7.1 Environmental Conditions:

Unless otherwise specified, the test shall be conducted under any combinations of the following environmental conditions.


Room Temperature 20 - 30°C

Relative Humidity 30 - 80%

Barometric Pressure 610 - 790mmHg

7.2 Test Specimen:

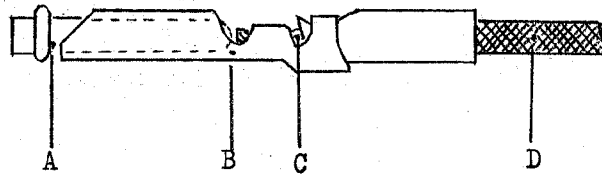
The test specimens employed for the performance testing shall be those normally crimped according to the specified crimp height onto the wires specified in Table 1. These specimens once employed for the test shall be not reused.

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7.3 Test Method:

7.3.1 Termination Resistance and Contact Resistance (Mating Area):

Measure the resistance values between the probing points on the mated pair of contacts and/or crimped wire as shown in Figure 3. The termination resistance and contact resistance shall be calculated according to the formular as shown below.



Termination Resistance : $R_{BD} - R_{CD}$

Contact Resistance : R_{AB}

Figure 3

7.3.2 Insulation Resistance:

Measure the insulation resistance between the adjacent contacts and between the contacts and ground in the mated pair of the connector housing, in accordance with Test Condition B ($500V \pm 10\%$), Test Method 302 of MIL-STD-202 with the use of 500V megger.

7.3.3 Dielectric Strength:

Measure the dielectric strength between the adjacent terminals and between the terminals and the ground which are accommodated in the mated connector housing by applying AC 1000V for 1 minute in accordance with Method 301 of MIL-STD-202.

7.3.4 Connector Insertion Force:

The insertion force of the connector assembly shall be measured by fastening the connector housing with its fully filled contacts onto the tensile tester, and operate the head to insert the connector assembly to mate with the gage pins with the speed approximately 100mm per minute. The gage pins used for this test shall be conforming to the specifications shown in Figure 4.

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7.3.5 Connector Extraction Force:

The extraction force of the connector assembly shall be measured by fastening the connector housing with its fully filled contacts onto the tensile tester, and operate the head to extract the connector assembly from the mated gage pins with the speed at a rate of 100mm per minute approximately.

7.3.6 Contact Extraction Force:


The extraction of the receptacle contact shall be measured by fastening the contact onto the tensile tester and operate the head to extract it from the mated gage pin with the speed at a rate of 100mm per minute approximately.

7.3.7 Contact Retention Force in the Housing Cavity:

The contact retention force of the contact shall be measured by fastening the housing assembly filled with the crimped contacts onto the tensile tester, and operate the head to pull off the contact from the contact cavity with the speed at a rate of 100mm per minute approximately. The retention force is determined when the contact is pulled out of the connector cavity without breakage of crimped wire.

7.3.8 Crimped Tensile Strength:

A wire of 150mm in length shall be crimped onto the receptacle contact. The test piece is fastened on the tensile testing machine, and measure the strength with the head travelling speed at a rate of 100mm per minutes approximately. The tensile strength is determined when the wire breaks or is pulled from the crimped section.

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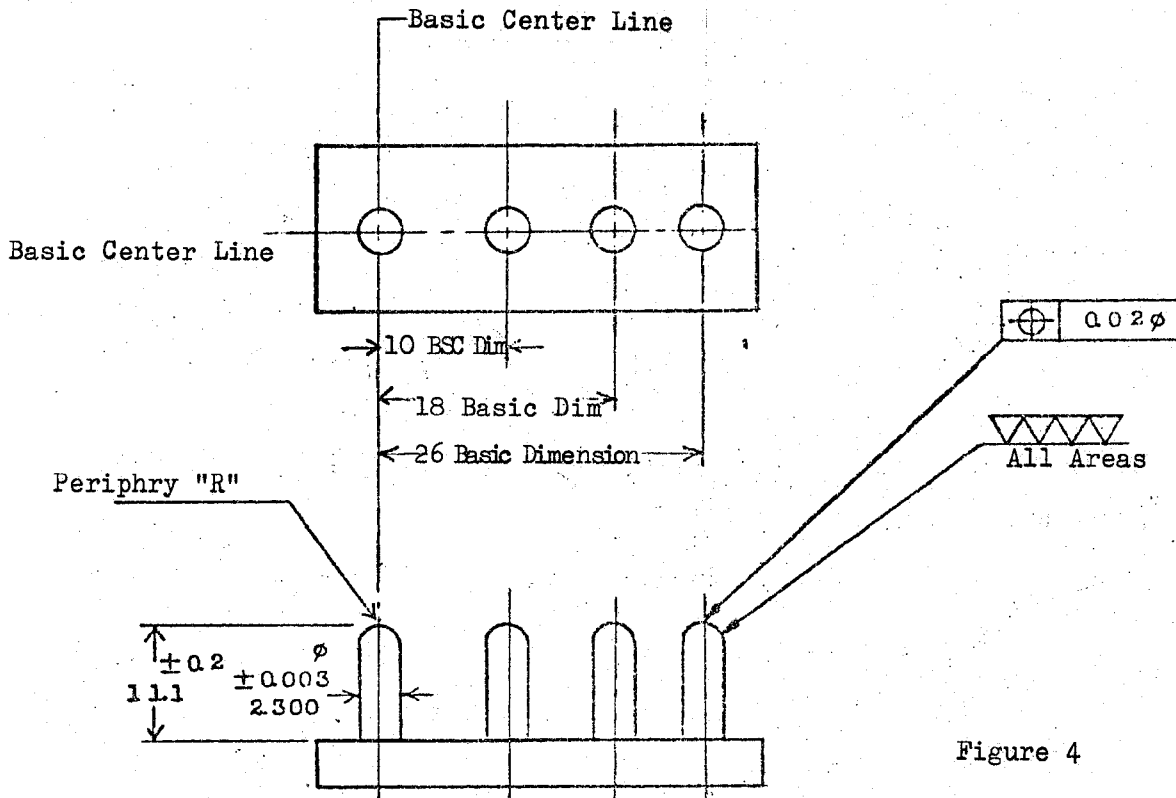


Figure 4

Material of Gage Pin: Tool Steel (Polish all the surface in vertical direction and top end to form a smooth periphery "R".)

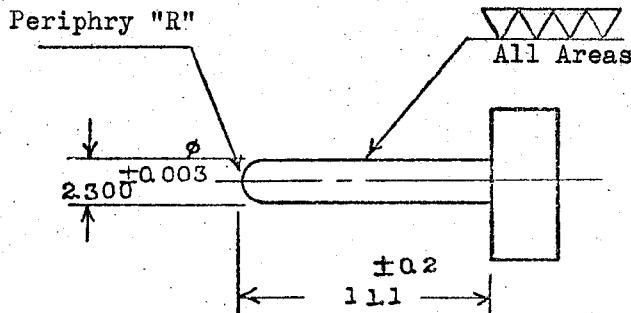


Figure 5

Material of Gage Pin: Tool Steel (Polish all the surface in vertical direction and top end to form a smooth periphery "R".)

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