

## AMP E.I. シリーズ・コネクタ (AMP "EI" Series, Connector)

## 1. 概要

本コネクタは一列の配列で極間は 2.5mm ピッチで構成されている。タイプは電線対基板の垂直型と水平型及び電線対電線のパネル取付型とフリーハンギング型がある。

## 2. 適用範囲

本規格は、マスターミネーションタイプを除くE.I.シリーズ・コネクタの全ての製品について適用する。

## 3. 材料及び表面処理

## 3.1 コンタクト圧着タイプ

## (1) 錫めっき製品

材質: 黄銅及び燐青銅

表面処理: 錫めっき済 0.8  $\mu\text{m}$ 以上

## (2) 金めっき製品

材質: 燐青銅

表面処理: ニッケル下地めっき 1~2  $\mu\text{m}$ の上に接触部のみ金めっき 0.38  $\mu\text{m}$ 以上

## 3.2 ポスト

## (1) 錫めっき製品(垂直タイプ及び水平タイプ)

材質: 黄銅線

表面処理: 銅下地めっき 0.5  $\mu\text{m}$ 以上の上に錫めっき 0.8  $\mu\text{m}$ 以上

## (2) 金めっき製品(垂直タイプ)

材質: 黄銅線

表面処理: ニッケル下地めっき 1~2  $\mu\text{m}$ の上に金めっき 0.38  $\mu\text{m}$ 以上

## 1. General Descriptions:

This connector has been designed in single line contact disposition in 2.5mm center line spacing. The connectors of vertical and horizontal types for wire-to-board termination, and panel mounting and free hanging types for wire-to-wire termination, are available.

## 2. Scope:

The products of "EI" series connectors, excepting mass termination type are governed under this specification.

## 3. Material and Finish:

## 3.1 Contact, Crimp Type:

## (1) Tin-Plated Products:

Materials: Brass and Phosphor Bronze

Finish: Pretinned, 0.8  $\mu\text{m}$  minimum thick

## (2) Gold-Plated Products:

Materials: Phosphor Bronze

Finish: 0.38  $\mu\text{m}$  minimum thick gold-plated for contact area only, over 1.0 ~ 2.0  $\mu\text{m}$  minimum thick nickel underplate

## 3.2 Post:

## (1) Tin-Plated Products: (Vertical and Horizontal Types)

Materials: Brass Wire

Finish: 0.8  $\mu\text{m}$  minimum thick tin-plated over 0.5  $\mu\text{m}$  minimum thick copper underplate

## (2) Gold-Plated Products: (Vertical Type)

Materials: Brass Wire

Finish: 0.38  $\mu\text{m}$  minimum thick gold-plated over 1.0 ~ 2.0  $\mu\text{m}$  thick nickel underplate

### 3.3 ハウジング

- (1) 材質: 66 ナイロン
- (2) 難燃性: UL94V-0

### 3.3 Housing:

- (1) Material: 6/6 NYLON
- (2) Flame Retardancy: UL94V-0

## 4. 性能

## 4. Performance:

### 4.1 定格

- (1) 電圧: AC250V及びDC350V
- (2) 電流: 2A(図1参照)
- (3) 周囲温度: 図1参照

### 4.1 Rating:

- (1) Voltage: 250V AC and 350V DC
- (2) Current: 2A (Refer to Fig.1)
- (3) Temperature: Refer to Fig. 1

### 4.2 一般性能

表1に示す一般性能に全て合格しなければならない。

### 4.2 Performance Requirements:

When tested in accordance with the applicable test method, all the products shall show performance capability to be acceptable to the following requirements.

| 項番        | 試験項目                      | 規格値  |  | 試験方法<br>項番                  |
|-----------|---------------------------|--|--|-----------------------------|
| Paragraph | Test Items                | Specified Requirements   |  | Test<br>Method<br>Para. No. |
| 4.2.1     | ローレベル抵抗                   | 10mΩ 以下  |  | 6.1                         |
|           | Termination Resistance    | Low level termination resistance shall be 10 m Ω Max.  |  |                             |
| 4.2.2     | 絶縁抵抗                      | 500MΩ 以上 (DC500V において)   |  | 6.2                         |
|           | Insulation Resistance     | Insulation Resistance shall be 500M Ω Min. when measured at 500V DC.                         |  |                             |
| 4.2.3     | 耐電圧                       | AC750V、1 分間で異常なきこと。  |  | 6.3                         |
|           | Dielectric Strength       | Connector shall show no abnormalities after applying test potential of 750V AC for 1 minute. |  |                             |
| 4.2.4     | 温度上昇                      | 30°C 以下 (注・図1 参照)  |  | 6.4                         |
|           | Temperature Rising        | Temperature rising of connector shall be 30 deg. Max. (Refer to Fig. 1)                      |  |                             |
| 4.2.5     | コンタクト保持力                  | 黄銅コンタクト  | りん青銅コンタクト                                    | 6.5                         |
|           |                           | 19.6N (2kgf) 以上 / 1 極  | 24.5N (2.5kgf) 以上 / 1 極                      |                             |
|           | Contact Retention Force   | Brass Contact  | Phosphor Bronze Contact                      |                             |
|           |                           | 19.6N (2kgf) Min. (4.41 lbs.) per position   | 24.5N (2.5kgf) Min. (5.51 lbs.) per position |                             |
| 4.2.6     | 低周波振動                     | 振動中 1 μ 秒を超える不連続導通を生じないこと。<br>ローレベル抵抗: 錫めっき製品 20mΩ 以下<br>金めっき製品 18mΩ 以下                      |  | 6.6                         |
|           | Vibration (Low Frequency) | No electrical discontinuity greater than 1 microsecond shall occur during the test.          |  |                             |
|           |                           | Termination Resistance: (Low level)  | Tin-Plated Products                          |                             |
|           |                           | Gold-Plated Products   | 18m Ω Max.                                   |                             |

 表1 (続く)  
 Table 1 (Cont.)

| 項番        | 試験項目   | 規格値   |                     | 試験方法<br>項番                  |                         |         |
|-----------|--|---|---------------------|-----------------------------|-------------------------|---------|
| Paragraph | Test Items   | Specified Requirements  |                     | Test<br>Method<br>Para. No. |                         |         |
| 4.2.7     | 耐湿性(定常状態)  | 割れ、フクレ、その他機能を損う欠陥のないこと。<br>ローレベル抵抗: 錫めっき製品 20mΩ 以下<br>金めっき製品 18mΩ 以下  |                     | 6.7                         |                         |         |
|           | Humidity<br>(Steady State)                                     | No abnormalities such as cracks, blister and other defects that are detrimental to connector functions, shall be present. |                     |                             |                         |         |
|           |  | Termination Resistance:<br>(Low Level)  | Tin-Plated Products |                             | 20mΩ Max.               |         |
| 4.2.8     | 塩水噴霧   | 割れ、フクレ、その他機能を損う欠陥のないこと。<br>ローレベル抵抗: 錫めっき製品 20mΩ 以下<br>金めっき製品 18mΩ 以下  |                     | 6.8                         |                         |         |
|           | Salt Spray   | No abnormalities such as cracks, blister and other defects that are detrimental to connector functions, shall be present. |                     |                             |                         |         |
|           |  | Termination Resistance:<br>(Low Level)  | Tin-Plated Products |                             | 20mΩ Max.               |         |
| 4.2.9     | はんだ付性<br>(ポストヘッダーのみに適用)  | 半田ヌレは 95%以上   |                     | 6.9                         |                         |         |
|           | Solderability<br>(Applicable to post header only)              | More than 95% of the tested area shall appear with sufficient coverage of wet solder.                                     |                     |                             |                         |         |
| 4.2.10    | はんだ耐熱性<br>(ポストヘッダーのみに適用)                                       | 機能を損う変形、欠陥のないこと。  |                     | 6.10                        |                         |         |
|           | Soldering Heat Resistivity<br>(Applicable to post header only) | Connector shall be free from the deformation and defects that are detrimental to connector functions.                     |                     |                             |                         |         |
| 4.2.11    | 圧着部引張強度  | AWG#20(0.52mm <sup>2</sup> ) 68.6N(7kgf) 以上   |                     | 6.11                        |                         |         |
|           |  | AWG#22(0.3mm <sup>2</sup> ) 49.0N(5kgf) 以上  |                     |                             |                         |         |
|           |  | AWG#24(0.2mm <sup>2</sup> ) 29.4N(3kgf) 以上  |                     |                             |                         |         |
|           |  | AWG#26(0.13mm <sup>2</sup> ) 19.6N(2kgf) 以上   |                     |                             |                         |         |
|           |  | AWG#28(0.08mm <sup>2</sup> ) 12.7N(1.3kgf) 以上   |                     |                             |                         |         |
|           |  | AWG#30(0.05mm <sup>2</sup> ) 7.8N(0.8kgf) 以上  |                     |                             |                         |         |
|           | Crimp Tensile Strength   | Wire Size   |                     |                             | Tensile Strength (Min.) |         |
|           |  | mm <sup>2</sup>   | (AWG)               |                             | N (kgf)                 | (lbs.)  |
|           |  | 0.52  | (#20)               |                             | 68.6N (7kgf)            | (15.43) |
|           |  | 0.3   | (#22)               |                             | 49.0N (5kgf)            | (11.02) |
|           | 0.2  | (#24)   | 29.4N (3kgf)        | (6.61)                      |                         |         |
|           | 0.13   | (#26)   | 19.6N (2kgf)        | (4.41)                      |                         |         |
|           | 0.08   | (#28)   | 12.7N (1.3kgf)      | (2.87)                      |                         |         |
|           | 0.05   | (#30)   | 7.8N (0.8kgf)       | (1.76)                      |                         |         |

 表1 (続く)  
 Table 1 (Cont.)

| 項番                     | 試験項目                                    | 規格値  |                    | 試験方法項番                |      |
|------------------------|---|--|--------------------|-----------------------|------|
| Paragraph              | Test Items                              | Specified Requirements   |                    | Test Method Para. No. |      |
| 4.2.12                 | ポスト保持力(ポストヘッダーのみに適用)                    | 19.6N(2kgf)以上  |                    | 6.12                  |      |
|                        | Post Retention Force                    | Retention force shall be 19.6N (2kgf) Min.<br>(4.41 lbs.)                            |                    |                       |      |
| 4.2.13                 | コンタクト単体挿抜力                              |  | 挿入力                | 引抜力                   | 6.13 |
|                        |   | 初回   | 5.9N(0.6kgf)以下     | 0.98N(0.1kgf)以上       |      |
|                        |   | 10回目   | 5.9N(0.6kgf)以下     | 0.78N(0.08kgf)以上      |      |
|                        | Contact Insertion and Extraction Force: | Contact insertion/extraction force shall be conforming to the value specified below. |                    |                       |      |
|                        |   |  | Insertion          | Extraction            |      |
|                        |   | Initial  | 5.9N (0.6kgf) Max. | 0.98N (0.1kgf) Min.   |      |
| 10 <sup>th</sup> Cycle | 5.9N (0.6kgf) Max.                      | 0.78N (0.08kgf) Min.   |                    |                       |      |

表1 (続く)  
Table 1 (Cont.)

| 項番               | 試験項目  | 規格値                      |                   |                        |                   | 試験方法<br>項番                  |        |
|------------------|---|--------------------------|-------------------|------------------------|-------------------|-----------------------------|--------|
| Paragraph        | Test Items  | Specified Requirements   |                   |                        |                   | Test<br>Method<br>Para. No. |        |
| 4.2.14           | コネクタ挿抜<br>力                                       |                          |                   | 挿入力                    | 引抜き力              | 6.14                        |        |
|                  |   | 12 極                     | 初回                | 73.5N (7.5kgf) 以下      | 19.6N (2.0kgf) 以上 |                             |        |
|                  |   |                          | 10 回目             | 73.5N (7.5kgf) 以下      | 14.7N (1.5kgf) 以上 |                             |        |
|                  |   | 10 極                     | 初回                | 68.6N (7.0kgf) 以下      | 19.6N (2.0kgf) 以上 |                             |        |
|                  |   |                          | 10 回目             | 68.6N (7.0kgf) 以下      | 14.7N (1.5kgf) 以上 |                             |        |
|                  |   | 9 極                      | 初回                | 68.6N (7.0kgf) 以下      | 19.6N (2.0kgf) 以上 |                             |        |
|                  |   |                          | 10 回目             | 68.6N (7.0kgf) 以下      | 14.7N (1.5kgf) 以上 |                             |        |
|                  |   | 8 極                      | 初回                | 63.7N (6.5kgf) 以下      | 14.7N (1.5kgf) 以上 |                             |        |
|                  |   |                          | 10 回目             | 63.7N (6.5kgf) 以下      | 9.8N (1.0kgf) 以上  |                             |        |
|                  |   | 7 極                      | 初回                | 53.9N (5.5kgf) 以下      | 14.7N (1.5kgf) 以上 |                             |        |
|                  |   |                          | 10 回目             | 53.9N (5.5kgf) 以下      | 9.8N (1.0kgf) 以上  |                             |        |
|                  |   | 6 極                      | 初回                | 49.0N (5.0kgf) 以下      | 14.7N (1.5kgf) 以上 |                             |        |
|                  |   |                          | 10 回目             | 49.0N (5.0kgf) 以下      | 9.8N (1.0kgf) 以上  |                             |        |
|                  |   | 5 極                      | 初回                | 39.2N (4.0kgf) 以下      | 14.7N (1.5kgf) 以上 |                             |        |
|                  |   |                          | 10 回目             | 39.2N (4.0kgf) 以下      | 9.8N (1.0kgf) 以上  |                             |        |
|                  |   | 4 極                      | 初回                | 29.4N (3.0kgf) 以下      | 9.8N (1.0kgf) 以上  |                             |        |
|                  |   |                          | 10 回目             | 29.4N (3.0kgf) 以下      | 7.8N (0.8kgf) 以上  |                             |        |
|                  |   | 3 極                      | 初回                | 24.5N (2.5kgf) 以下      | 7.8N (0.8kgf) 以上  |                             |        |
|                  | 10 回目   |                          | 24.5N (2.5kgf) 以下 | 4.9N (0.5kgf) 以上       |                   |                             |        |
|                  | 2 極   | 初回                       | 19.6N (2.0kgf) 以下 | 7.8N (0.8kgf) 以上       |                   |                             |        |
|                  |   | 10 回目                    | 19.6N (2.0kgf) 以下 | 4.9N (0.5kgf) 以上       |                   |                             |        |
|                  | Connector<br>Insertion and<br>Extraction<br>Force | No. of<br>Posi-<br>tions | Meas-<br>ured at  | Insertion Force (Max.) |                   | Extraction Force (Min.)     |        |
|                  |   |                          |                   | N (kgf)                | (lbs.)            | N (kgf)                     | (lbs.) |
|                  |   | 12                       | Initial           | 73.5N (7.5kgf)         | (16.5)            | 19.6N (2.0kgf)              | (4.4)  |
|                  |   |                          | 10 <sup>th</sup>  | 73.5N (7.5kgf)         | (16.5)            | 14.7N (1.5kgf)              | (3.3)  |
|                  |   | 10                       | Initial           | 68.6N (7.0kgf)         | (15.4)            | 19.6N (2.0kgf)              | (4.4)  |
|                  |   |                          | 10 <sup>th</sup>  | 68.6N (7.0kgf)         | (15.4)            | 14.7N (1.5kgf)              | (3.3)  |
|                  |   | 9                        | Initial           | 68.6N (7.0kgf)         | (15.4)            | 19.6N (2.0kgf)              | (4.4)  |
|                  |   |                          | 10 <sup>th</sup>  | 68.6N (7.0kgf)         | (15.4)            | 14.7N (1.5kgf)              | (3.3)  |
|                  |   | 8                        | Initial           | 63.7N (6.5kgf)         | (14.3)            | 14.7N (1.5kgf)              | (3.3)  |
|                  |   |                          | 10 <sup>th</sup>  | 63.7N (6.5kgf)         | (14.3)            | 9.8N (1.0kgf)               | (2.2)  |
|                  |   | 7                        | Initial           | 53.9N (5.5kgf)         | (12.1)            | 14.7N (1.5kgf)              | (3.3)  |
| 10 <sup>th</sup> |   |                          | 53.9N (5.5kgf)    | (12.1)                 | 9.8N (1.0kgf)     | (2.2)                       |        |
| 6                |   | Initial                  | 49.0N (5.0kgf)    | (11.0)                 | 14.7N (1.5kgf)    | (3.3)                       |        |
|                  |   | 10 <sup>th</sup>         | 49.0N (5.0kgf)    | (11.0)                 | 9.8N (1.0kgf)     | (2.2)                       |        |
| 5                |   | Initial                  | 39.2N (4.0kgf)    | (8.8)                  | 14.7N (1.5kgf)    | (3.3)                       |        |
|                  |   | 10 <sup>th</sup>         | 39.2N (4.0kgf)    | (8.8)                  | 9.8N (1.0kgf)     | (2.2)                       |        |
| 4                |   | Initial                  | 29.4N (3.0kgf)    | (6.6)                  | 9.8N (1.0kgf)     | (2.2)                       |        |
|                  |   | 10 <sup>th</sup>         | 29.4N (3.0kgf)    | (6.6)                  | 7.8N (0.8kgf)     | (1.8)                       |        |
| 3                |   | Initial                  | 24.5N (2.5kgf)    | (5.5)                  | 7.8N (0.8kgf)     | (1.8)                       |        |
|                  |   | 10 <sup>th</sup>         | 24.5N (2.5kgf)    | (5.5)                  | 4.9N (0.5kgf)     | (1.1)                       |        |
| 2                |   | Initial                  | 19.6N (2.0kgf)    | (4.4)                  | 7.8N (0.8kgf)     | (1.8)                       |        |
|                  |   | 10 <sup>th</sup>         | 19.6N (2.0kgf)    | (4.4)                  | 4.9N (0.5kgf)     | (1.1)                       |        |

 表1 (続く)  
 Table 1 (Cont.)

| 項番        | 試験項目  | 規 格 値                    |            |                     | 試験方法<br>項番                  |
|-----------|---|--------------------------|------------|---------------------|-----------------------------|
| Paragraph | Test Items  | Specified Requirements   |            |                     | Test<br>Method<br>Para. No. |
| 4.2.15    | パネル挿入力・保持力<br>(パネル取付型のみに適<br>用)   | パネル挿入力                   | 7, 8 極     | 78.4N (8kgf) 以下     | 6.15                        |
|           |   |                          | 2~6 極      | 49.0N (5kgf) 以下     |                             |
|           |   | パネル保持力                   | 7, 8 極     | 98.1N (10kgf) 以上    |                             |
|           |   |                          | 2~6 極      | 73.5N (7.5kgf) 以上   |                             |
|           | Panel Insertion and<br>Retention Force<br>(Applicable to panel<br>mount type connector) | Panel Insertion<br>Force | 7 & 8 Pos. | 78.4N (8kgf) Max.   |                             |
|           |   |                          | 2~6 Pos.   | 49.0N (5kgf) Max.   |                             |
|           |   | Panel Retention<br>Force | 7 & 8 Pos. | 98.1N (10kgf) Min.  |                             |
|           |   |                          | 2~6 Pos.   | 73.5N (7.5kgf) Min. |                             |

表1 (終り)  
Table 1 (End)

## 5. 品質保証条件

### 5.1 試料

試料は完全に管理された製品を使用すること。

### 5.2 試験環境

下記に示す環境条件のもとで試験を行うこと。

温度 15°C~35°C

湿度 45%~75%

気圧(水銀柱)  $8.7 \times 10^4 \sim 1.07 \times 10^5$  Pa  
(650~800mmHg)

## 5. Quality Assurance Provisions:

### 5.1 Test Specimens:

Test specimens shall be prepared in accordance with the methods and procedure specified by appropriate AMP specification and instruction sheet, by using applicable application tooling.

### 5.2 Test Conditions:

All the tests shall be conducted under any combination of the following test conditions.

Temperature: 15°C ~ 35°C

Relative Humidity: 45% ~ 75%

Atmospheric Pressure:  $8.7 \times 10^4 \sim 1.07 \times 10^5$  Pa  
(650~800mmHg)

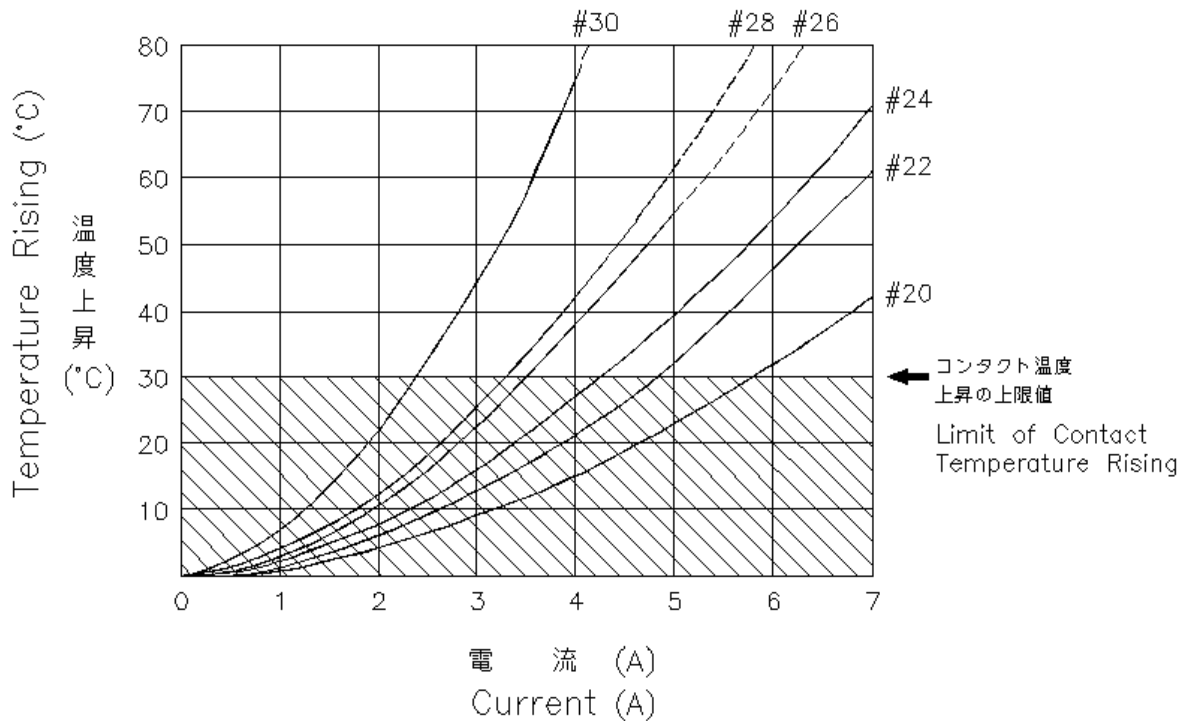


図1 電流対温度上昇特性

Fig. 1 Temperature vs. Current

本製品の最大許容温度は、ハウジングの最大許容温度、錫めっき・コンタクトの最大許容温度により、-20°C～+95°Cの範囲とし、使用電流によるコンタクト部分の温度上昇分と使用環境による周囲温度の和により次式から算出される。

$$\text{最大許容温度} = \text{温度上昇} + \text{周囲温度}$$

この時の温度上昇は、個々の電線の許容電流値以下とし、電線サイズと種類及び電流値により図1より選ぶこと。

但し、電流値は温度上昇が30°C以下の範囲内とする。

The maximum current that can be carried in any given connector is limited by maximum operating temperature of housing material used and influenced by the wire size, connector size (number of cavities operating) and the ambient temperature in which the connector is used. The maximum intensity of current can be calculated by the following formula, taking consideration of temperature rating specified in the range of -20°C through +95°C (-13.0°F through +203°F) and maximum allowable temperature for tin-plated connector.

$$\text{Maximum Operating Temperature} = \text{Temperature Rise} + \text{Ambient Temperature}$$

The rate of temperature rising must be held within the limit obtained from maximum allowable current loaded on individual operating wire and total current shall be determined by the curves shown in Fig.1. In any case, total amount of temperature rising shall be held within 30 degrees over the ambient temperature.

Note: The dotted line section indicates estimated rate of temperature rising.



## 6. 試験方法

### 6.1 ローレベル抵抗試験方法

図2に示す如く、回路電流 50mA 以下、回路開放電圧 50mV 以下の測定回路において測定し、電線導体抵抗 75mm 分を差し引いて算出する。

### 6.2 絶縁抵抗試験方法

コネクタを嵌合状態(ポストヘッダーは基板に取付けないで)にし、ハウジング内の隣接している端子相互間を DC500V で測定する。

### 6.3 耐電圧試験方法

コネクタを嵌合状態(ポストヘッダーは基板に取付けないで)にし、ハウジング内の隣接している端子相互間に AC750V、1分間印加する。

### 6.4 温度上昇試験方法

試料を直列になるように結線し、測定カ所はコンタクト圧着部分を熱電対法にて測定する。

### 6.5 コンタクト保持力試験方法

ハウジングをショッパ引張試験機に取り付け、ハウジングに挿着されたコンタクトを軸方向に毎分 100mm の速度で操作して測定する。

## 6. Test Methods:

### 6.1 Termination Resistance (Low Level):

Low level termination resistance is obtained by measuring millivolt drop of the test circuit as shown in Fig.2, by applying test current of 50 mA at open circuit voltage of 50mV flowing through the circuit. From the measured value, low level resistance is calculated after deducting resistance of crimped wire of 75mm in length.

### 6.2 Insulation Resistance:

Insulation resistance is obtained by applying test potential of 500V DC across the adjacent contacts in the connector housing after connector is mated without having post header mounted on printed circuit board.

### 6.3 Dielectric Strength:

Dielectric strength is measured by applying test potential of 750V AC across the adjacent contacts in the connector housing after connector is mated without having post header mounted on printed circuit board.

### 6.4 Temperature Rising:

After having contacts series wired, measure temperature rising of contacts by probing on wire crimp by using thermocouple.

### 6.5 Contact Retention Force:

Contact loaded housing must be fastened on the head of tensile testing machine, and apply an axial pull off load to contact lead by operating the head to travel with the speed at a rate of 100mm a minute. Contact retention force is determined when receptacle contact is dislodged from housing cavity.

#### 6.6 低周波振動試験方法

嵌合状態の試料をプリント基板又は取付用パネルに固定し、直列回路になるように結線し、試験機に取り付け、0.1Aを通电して試験する。

振動方向はX、Y、Z方向各2時間、最大全振幅1.5mm、振動周波数10～55Hz往復1分間。(尚、電線対電線接続タイプはパネル取付型によって試験を代表する)

#### 6.7 耐湿度試験方法

嵌合状態の試料を湿度90～95%、温度40°Cの環境中で連続96時間放置後、室温中に1時間放置してから測定する。

#### 6.8 塩水噴霧試験方法

嵌合状態の試料を、塩水濃度5%、温度35°Cの環境中で連続48時間放置後、室温中に1時間放置してから測定する。

#### 6.9 はんだ付試験方法(電線対基板タイプのポストヘッダーに適用)

ポストヘッダーのはんだ付け部分をフラックス(アルファ100、GX-5、GX-7)に5～10秒間浸漬した後230±5°Cのはんだ(錫60%、鉛40%)槽中に3±0.5秒間浸漬する。

#### 6.6 Vibration:

Contact loaded and mated pair of connectors must be mounted on printed circuit board or mounting panel with all the contacts series wired, and fastened on the vibration table. The said connectors are vibrated with maximum amplitude of 1.5mm both sides in the sweeping frequencies to reciprocate between 10 and 55 Hz, changing at a rate of one cycle a minute. During the vibration, the circuit must be monitored by applying to the current of 0.1A for occurrence of electrical discontinuity resulted from the vibration. Vibration must be applied to the sample connector in three axial planes for totally 6 hours, each plane vibrated for 2 hours.

#### 6.7 Humidity:

Humidity testing shall be performed by exposing the contact-loaded and mated pair of connectors under the atmosphere of 90 ~ 95% R.H. at 40°C for 96 hours in the test chamber, and after the test duration, recondition in the room temperature for 1 hour before undergoing the subsequent measurements.

#### 6.8 Salt Spray:

Contact-loaded and mated pair of connectors shall be exposed under the 5% salt solution spray for 48 hours at 35°C. After completion of test duration, the sample connectors shall be taken out from the test chamber and reconditioned in the room temperature for 1 hour, and tested for low level termination resistance.

#### 6.9 Solderability (Applicable to Post Header, Wire-to-Board Only):

Dip contact ends of post header in flux (ALPHA 100 GX-5 or GX-7 is recommended.) for 5~10 seconds, then, immerse in soldering tub that is filled with 60% tin, 40% lead solder heated at 230±5°C, for 3±0.5 seconds.

6.10 はんだ耐熱試験方法(電線対基板タイプのポストヘッダーに適用)

ポストヘッダーをプリント基板の取付穴に挿入後260±5°Cのはんだ槽中に10±0.5秒間浸漬する。手半田の場合ポストヘッダーをプリント基板の取付穴に挿入後350±10°C 1～2秒にて半田付を行う。但しポストの半田付部にこて先等による加圧のなきこと。

6.11 圧着部引張試験方法

電線(撚線)を圧着したコンタクトをショッパー引張試験機に取り付け、軸方向に毎分100mmの速度で操作して測定する(被覆部は含まない)。

6.12 ポスト保持力試験方法(電線対基板タイプのポストヘッダーに適用)

ポストヘッダー・アッセンブリーのハウジングを図3の如く治具で受け、ポスト先端を軸方向に垂直にフォース・ゲージで押して測定する。

6.13 コンタクト挿抜力試験方法

リセプタクル・コンタクトを引張試験機に取り付け、図4に規定するゲージを軸方向に毎分100mmの速度で操作し、測定する。

6.10 Soldering Heat Resistivity (Applicable to Post Header, Wire-to-Board Type Only):

With post header inserted into the mounting holes, printed circuit board shall be processed for soldering for 10±0.5 seconds in the soldering tub where the temperature is controlled at 260±5°C.

(Manual Soldering)

In case of manual soldering, test the sample post header assembled on PCB, by applying soldering iron, controlled at 350±10°C for 1 to 2 seconds. In this testing, soldering spot of the post shall remain free from the pressure by the applied soldering iron.

6.11 Crimp Tensile Strength:

Fasten a wire-crimped contact lead onto the head of tensile testing machine and apply an axial pull off load to the wire by operating the head to travel with the speed at a rate of 100mm a minute without insulation support crimp set in effect. Crimp tensile strength is determined when the wire is broken or is pulled off from the wire crimp.

6.12 Post Retention Force (Applicable to Post Header, Wire-to-Board Type Only):

Place post inserted header assembly over the test fixture in the manner as shown in Fig.3, and apply an axial push down force on top of post contact. Post retention force is determined when the post is dislodged from the inserted position. Measurement shall be done by using a force gage.

6.13 Contact Insertion/Extraction Force:

Fasten a receptacle contact on the head of tensile testing machine, and apply axial loads to the receptacle contact to mate with and unmate from the gage, specified in Fig.4, by operating the head to travel with the speed at a rate of 100mm a minute.

#### 6.14 コネクタ挿抜力試験方法

コネクタを引張試験機に取り付け、軸方向に毎分100mmの速度で操作して嵌合、離脱を行いコネクタの挿入力及び引抜力を測定する。

#### 6.14 Connector Mating/Unmating Force:

Fasten receptacle contacts loaded housing on tensile testing machine in the manner that they are aligned to mate with and unmate from the gage as the head is operated to travel with the speed at a rate of 100mm a minute.

#### 6.15 パネル挿入力・保持力試験方法(電線対電線タイプパネル取付型キャップハウジングに適用)

キャップハウジングを引張試験機に取り付け、軸方向に毎分100mmの速度で操作して製品図面上に指定された寸法で穴明けが施された取付用パネルへの挿入力及び装着後の保持力を測定する。

#### 6.15 Panel Insertion and Retention Force (Applicable to Post Header, Wire-to-Board Type Only):

Fasten cap housing onto the head of tensile testing machine, and test the force required to insert the housing into the mounting hole that is made through the mounting panel, and the force required to pull-off the housing from the panel, by operating the head to travel with the speed at a rate of 100mm a minute.

## 7. 試験順序

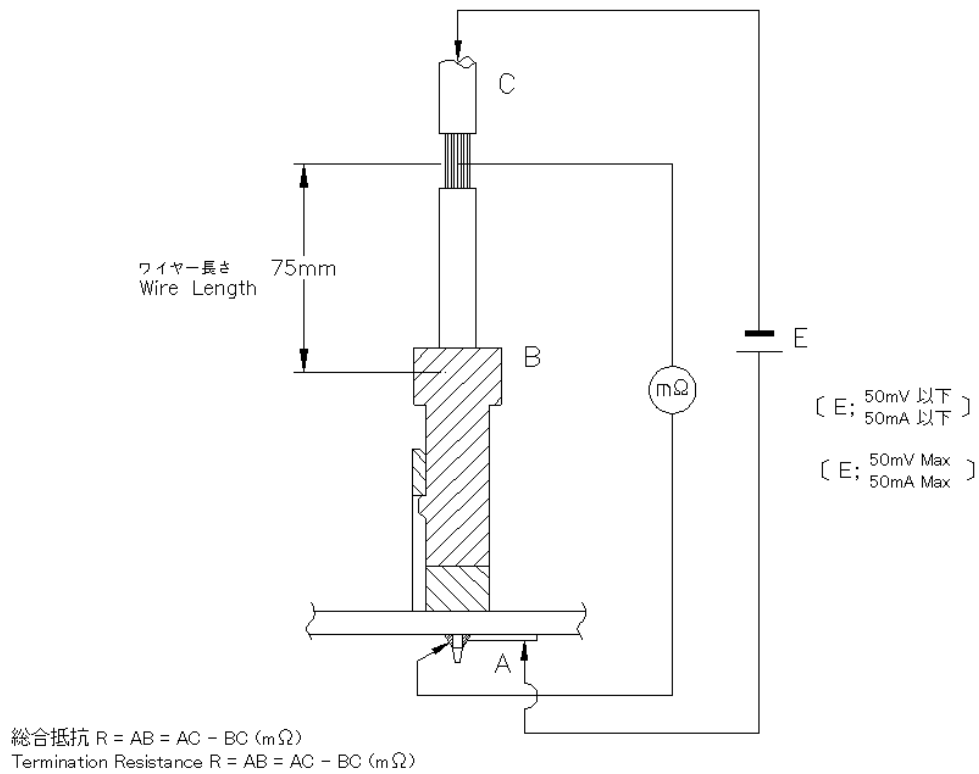
試験は各試料をグループ別に分け、表2の順序で実施すること。

## 7. Test Sequence:

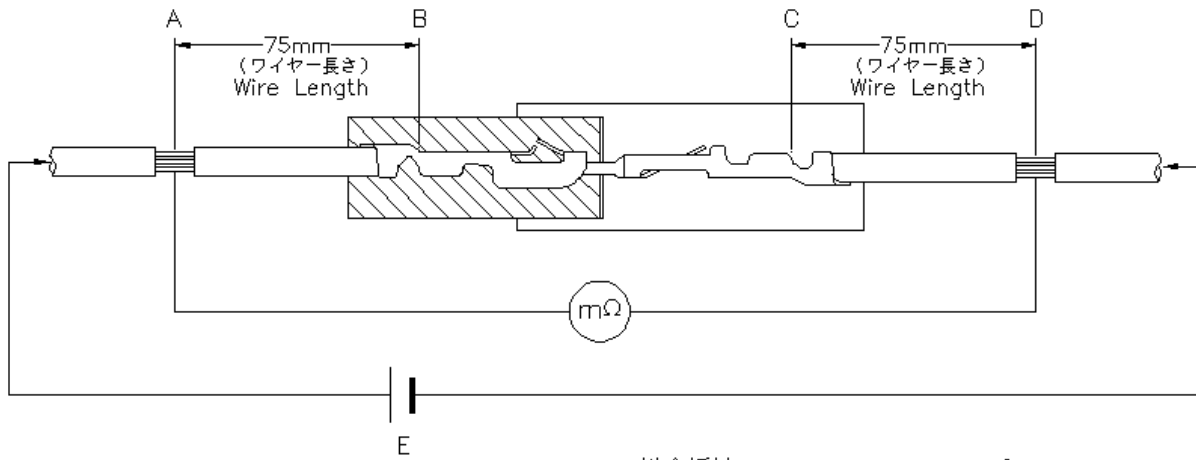
The following sample groups shall be prepared, and employed for the tests in the sequence specified in Table 2 below.

| 試験方法<br>Test Method<br>Paragraph | 試験項目<br>Test Item                                     | 試験グループ番号<br>Sample Group |  |   |   |     |     |     |   |   |    |    |    |
|----------------------------------|---|--------------------------|--|---|---|-----|-----|-----|---|---|----|----|----|
|                                  |   | 1                        | 2  | 3 | 4 | 5   | 6   | 7   | 8 | 9 | 10 | 11 | 12 |
|                                  |   | 6.1                      | ローレベル抵抗<br>Termination Resistance<br>(Low Level) |   |   | 1,3 | 1,3 | 1,3 |   |   |    |    |    |
| 6.2                              | 絶縁抵抗<br>Insulation Resistance                         | 1                        |  |   |   |     |     |     |   |   |    |    |    |
| 6.3                              | 耐電圧<br>Dielectric Strength                            | 2                        |  |   |   |     |     |     |   |   |    |    |    |
| 6.4                              | 温度上昇<br>Temperature Rising                            |                          | 1  |   |   |     |     |     |   |   |    |    |    |
| 6.5                              | コンタクト保持力<br>Contact Retention Force                   | 3                        |  |   |   |     |     |     |   |   |    |    |    |
| 6.6                              | 低周波振動<br>Vibration (Low Frequency)                    |                          |  | 2 |   |     |     |     |   |   |    |    |    |
| 6.7                              | 耐湿性<br>Humidity                                       |                          |  |   | 2 |     |     |     |   |   |    |    |    |
| 6.8                              | 塩水噴霧<br>Salt Spray                                    |                          |  |   |   | 2   |     |     |   |   |    |    |    |
| 6.9                              | はんだ付性<br>Solderability                                |                          |  |   |   |     | 1   |     |   |   |    |    |    |
| 6.10                             | はんだ耐熱性<br>Soldering Heat Resistibility                |                          |  |   |   |     |     | 1   |   |   |    |    |    |
| 6.11                             | 圧着部引張強度<br>Crimp Tensile Strength                     |                          |  |   |   |     |     |     | 1 |   |    |    |    |
| 6.12                             | ポスト保持力<br>Post Retention Force                        |                          |  |   |   |     |     |     |   | 1 |    |    |    |
| 6.13                             | コンタクト単体挿抜力<br>Contact Insertion /<br>Extraction Force |                          |  |   |   |     |     |     |   |   | 1  |    |    |
| 6.14                             | コネクタ挿抜力<br>Connector Mating /<br>Unmating Force       |                          |  |   |   |     |     |     |   |   |    | 1  |    |
| 6.15                             | パネル挿入力・保持力<br>Panel Insertion and<br>Retention Force  |                          |  |   |   |     |     |     |   |   |    |    | 1  |

表2  
Table 2



電線対基板タイプ  
Wire-to-Board Type



総合抵抗  $R = AD - (AB + CD)$  (mΩ)  
Termination Resistance  $R = AD - (AB + CD)$  (mΩ)

電線対電線タイプ  
Wire-to-Wire Type

図2 ローレベル抵抗試験方法

Fig. 2 Low Level Termination Resistance Measuring Method

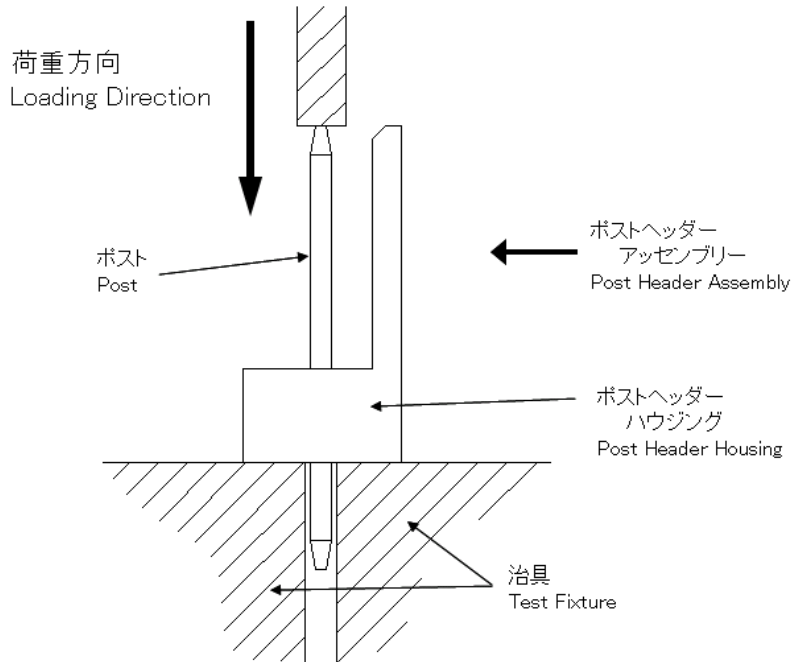


図3 ポスト保持力試験方法

Fig. 3 Post Retention Force Measuring Method

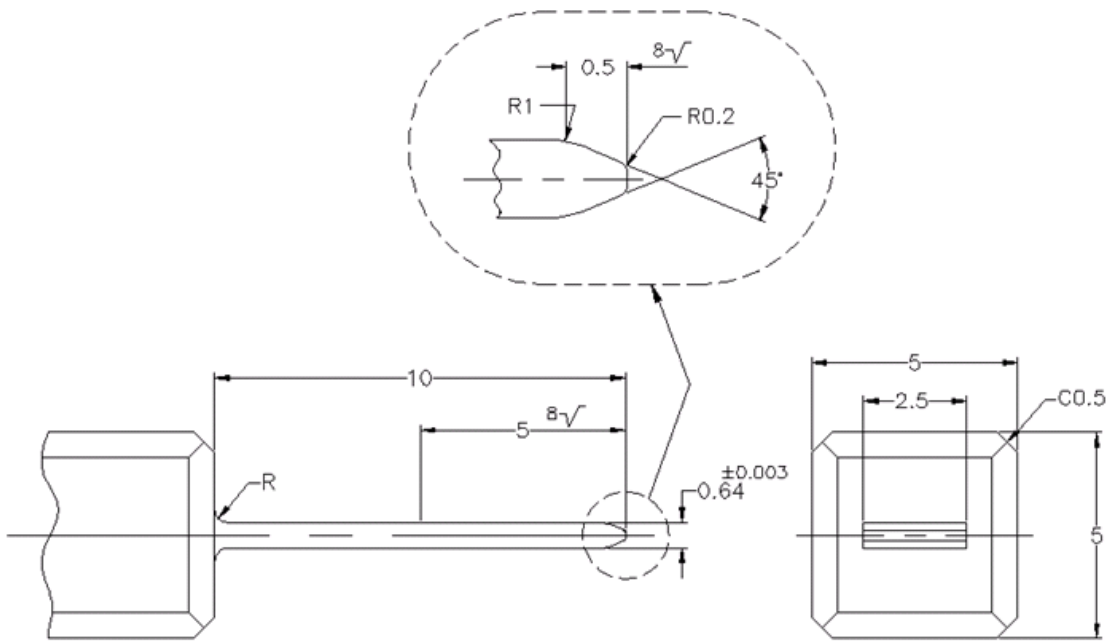


図4 コンタクト挿抜力測定用ゲージ

Fig. 4 Contact Insertion/Extraction Force Measuring Method

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