

# MHF® 5 / 5L Connector (φ0.84 Cable)

Part No. MHF 5L Plug:20714-001R-81, MHF 5 Receptacle:20566-001E-01

## Test Report

Product Specification no. PRS-2236

|      |        |                  |             |             |              |
|------|--------|------------------|-------------|-------------|--------------|
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| 3    | T22103 | June 23, 2022    | K. Watanabe | K. Yufu     | Y. Hashimoto |
| 2    | T21108 | October 28, 2021 | K. Ikeshita |             | M. Takemoto  |
| 1    | T19039 | March 8, 2019    | K. Tanaka   | T. Yamauchi | T. Hirakawa  |
| Rev. | ECN    | Date             | Prepared by | Checked by  | Approved by  |

## 1. 目的

MHF 5 / 5L Connector の性能を PRS-2236 に基づいて評価する。

## 2. 試料

- (1) MHF 5L Plug (Part No: 20714-001R-81)  
Cable: AWG#33 coaxial cable (Jacket diameter 0.84 mm)
- (2) MHF 5 Receptacle (Part No: 20566-001E-01)

## 3. 試験順序

全ての評価は Table 1 の試験順序に従って行った。

## 4. 結果

Table 2、グラフ 1～11 参照。試験条件の詳細は PRS-2236 参照。

## 5. 結論

全ての資料が製品規格（PRS-2236）の必要条件を満足した。

Table 1 試験順序と試料数

| 試験項目          |            | グループ |    |     |    |    |     |     |     |     |     |     |     |    |    |
|---------------|------------|------|----|-----|----|----|-----|-----|-----|-----|-----|-----|-----|----|----|
|               |            | A    | B  | C   | D  | E  | F   | G   | H   | J   | K   | L   | M   | N  | P  |
| 接触抵抗          |            |      |    | 1,3 |    |    | 1,3 | 1,3 | 1,5 | 1,5 | 1,3 | 1,3 | 1,3 |    |    |
| 絶縁抵抗          |            |      |    |     |    |    |     |     | 2,6 | 2,6 |     |     |     |    |    |
| 耐電圧           |            |      |    |     |    |    |     |     | 3,7 | 3,7 |     |     |     |    |    |
| VSWR          |            | 1    |    |     |    |    |     |     |     |     |     |     |     |    |    |
| 抜去力           |            |      | 1  |     |    |    |     |     |     |     |     |     |     |    |    |
| 耐久性           |            |      |    | 2   |    |    |     |     |     |     |     |     |     |    |    |
| 引張り強度         |            |      |    |     | 1  |    |     |     |     |     |     |     |     |    |    |
| ケーブル保持力       |            |      |    |     |    | 1  |     |     |     |     |     |     |     |    |    |
| 耐振動性          |            |      |    |     |    |    | 2   |     |     |     |     |     |     |    |    |
| 耐衝撃性          |            |      |    |     |    |    |     | 2   |     |     |     |     |     |    |    |
| 湿度（定常状態）      |            |      |    |     |    |    |     |     | 4   |     |     |     |     |    |    |
| 熱衝撃           |            |      |    |     |    |    |     |     |     | 4   |     |     |     |    |    |
| 高温寿命          |            |      |    |     |    |    |     |     |     |     | 2   |     |     |    |    |
| 硫化水素ガス        |            |      |    |     |    |    |     |     |     |     |     | 2   |     |    |    |
| 塩水噴霧          |            |      |    |     |    |    |     |     |     |     |     |     | 2   |    |    |
| 半田付け性         |            |      |    |     |    |    |     |     |     |     |     |     |     | 1  |    |
| 半田耐熱性         |            |      |    |     |    |    |     |     |     |     |     |     |     |    | 1  |
| 試料数<br>(pcs.) | Plug       | 10   | 10 | 10  | 10 | 10 | 10  | 10  | 10  | 10  | 10  | 10  | 10  | -  | -  |
|               | Receptacle | 5    |    |     | -  |    |     |     |     |     |     |     |     | 10 | 10 |

※グループ表中の番号は、試験順序を示す。

Table 2-1

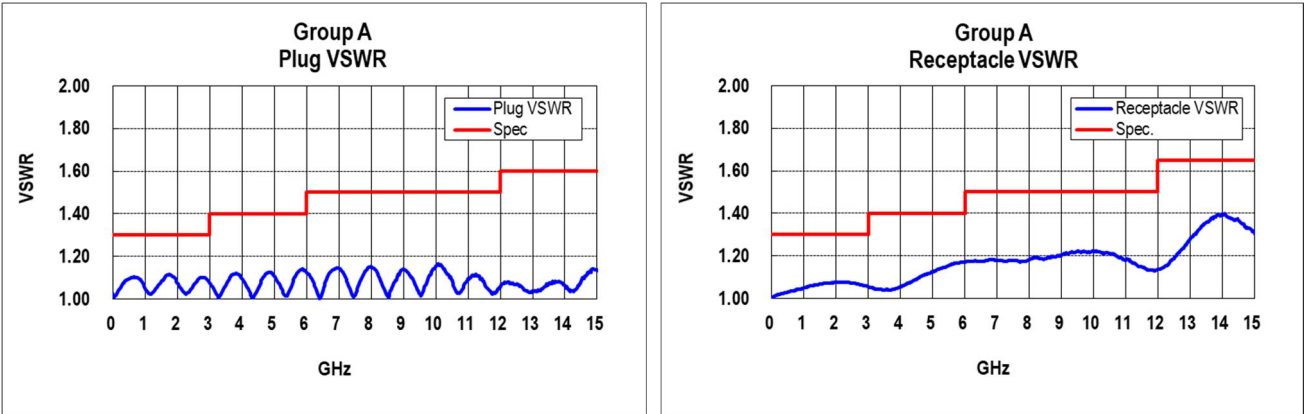
| Group    | 試験項目          | 測定項目                     | 規 格            | 試料数 | 単位   | 平均    | 最大   | 最小   | S     | 判定   |
|----------|---------------|--------------------------|----------------|-----|------|-------|------|------|-------|------|
| A        | VSWR          |                          |                |     |      |       |      |      |       |      |
|          | Plug          | 0.1~3.0GHz               | 1.30 MAX.      | 10  | -    | 1.118 | 1.13 | 1.10 | 0.007 | Pass |
|          |               | 3.0~6.0GHz               | 1.40 MAX.      |     |      | 1.142 | 1.17 | 1.12 | 0.014 | Pass |
|          |               | 6.0~9.0 GHz              | 1.50 MAX.      |     |      | 1.149 | 1.17 | 1.12 | 0.014 | Pass |
|          |               | 9.0~12.0 GHz             | 1.50 MAX.      |     |      | 1.151 | 1.17 | 1.12 | 0.015 | Pass |
|          |               | 12.0~15.0 GHz            | 1.60 MAX.      |     |      | 1.145 | 1.19 | 1.11 | 0.018 | Pass |
|          | Receptacle    | 0.1~3.0GHz               | 1.30 MAX.      | 5   | -    | 1.083 | 1.09 | 1.07 | 0.008 | Pass |
|          |               | 3.0~6.0GHz               | 1.40 MAX.      |     |      | 1.180 | 1.20 | 1.17 | 0.012 | Pass |
|          |               | 6.0~9.0 GHz              | 1.50 MAX.      |     |      | 1.213 | 1.23 | 1.19 | 0.018 | Pass |
|          |               | 9.0~12.0 GHz             | 1.50 MAX.      |     |      | 1.234 | 1.26 | 1.22 | 0.017 | Pass |
|          |               | 12.0~15.0 GHz            | 1.65 MAX.      |     |      | 1.410 | 1.45 | 1.38 | 0.033 | Pass |
| B        | 抜去力           | Initial                  | 5 N MIN.       | 10  | N    | 11.15 | 11.9 | 10.4 | 0.32  | Pass |
|          |               | After 30 cycles          | 3 N MIN.       |     |      | 7.24  | 7.9  | 6.2  | 0.24  | Pass |
|          | C             | 耐久性                      |                |     |      |       |      |      |       |      |
| 中心導体接触抵抗 |               | Initial                  | 20mΩ MAX.      | 10  | mΩ   | 7.30  | 8.1  | 6.4  | 0.59  | Pass |
|          |               | After testing            | -              |     |      | 8.21  | 10.0 | 6.8  | 1.04  | Pass |
|          |               | ΔR                       | ΔR 20mΩ MAX.   |     |      | 0.90  | 3.0  | -0.9 | 1.29  | Pass |
|          |               |                          |                |     |      |       |      |      |       |      |
| 外部導体接触抵抗 |               | Initial                  | 20mΩ MAX.      | 10  | mΩ   | 4.84  | 6.0  | 3.9  | 0.68  | Pass |
|          |               | After testing            | -              |     |      | 5.05  | 6.1  | 4.3  | 0.58  | Pass |
|          |               | ΔR                       | ΔR 100mΩ MAX.  |     |      | 0.31  | 1.8  | -1.3 | 0.87  | Pass |
|          |               |                          |                |     |      |       |      |      |       |      |
| 外観       |               | 規格：機能を損なう異常無き事           |                |     |      |       |      |      |       |      |
|          | Initial       | 異常なし                     | 10             | -   | 異常なし |       |      |      | Pass  |      |
|          | After testing |                          |                |     | 異常なし |       |      |      | Pass  |      |
| D        | 引張り強度         | After testing            | 10N MIN.       | 10  | N    | 18.66 | 19.8 | 17.2 | 0.69  | Pass |
|          |               |                          |                |     |      |       |      |      |       |      |
| E        | ケーブル保持力       |                          |                |     |      |       |      |      |       |      |
|          | 電流瞬断          | 規格：試験中、1μsを超える電氣的瞬断の無き事。 |                |     |      |       |      |      |       |      |
|          |               | After testing            | -              | 10  | -    | 瞬断なし  |      |      |       | Pass |
|          |               | 外観                       | 規格：機能を損なう異常無き事 |     |      |       |      |      |       |      |
|          | After testing |                          | -              | 10  | -    | 異常なし  |      |      |       | Pass |
| F        | 耐振動性          |                          |                |     |      |       |      |      |       |      |
|          | 中心導体接触抵抗      | Initial                  | 20mΩ MAX.      | 10  | mΩ   | 7.64  | 8.1  | 7.0  | 0.36  | Pass |
|          |               | After testing            | -              |     |      | 7.42  | 7.9  | 6.8  | 0.40  | Pass |
|          |               | ΔR                       | ΔR 20mΩ MAX.   |     |      | -0.21 | 0.4  | -0.8 | 0.33  | Pass |
|          |               |                          |                |     |      |       |      |      |       |      |
|          | 外部導体接触抵抗      | Initial                  | 20mΩ MAX.      | 10  | mΩ   | 4.29  | 4.7  | 3.9  | 0.27  | Pass |
|          |               | After testing            | -              |     |      | 4.36  | 4.8  | 4.0  | 0.27  | Pass |
|          |               | ΔR                       | ΔR 100mΩ MAX.  |     |      | 0.07  | 0.6  | -0.4 | 0.41  | Pass |
|          |               |                          |                |     |      |       |      |      |       |      |
|          | 電流瞬断          | 規格：試験中、1μsを超える電氣的瞬断の無き事。 |                |     |      |       |      |      |       |      |
|          |               | After testing            | -              | 10  | -    | 瞬断なし  |      |      |       | Pass |
|          | 外観            | 規格：機能を損なう異常無き事           |                |     |      |       |      |      |       |      |
|          |               | Initial                  | 異常なし           | 10  | -    | 異常なし  |      |      |       | Pass |
|          |               | After testing            |                |     |      | 異常なし  |      |      |       | Pass |
|          |               |                          |                |     |      |       |      |      |       |      |

Table 2-2

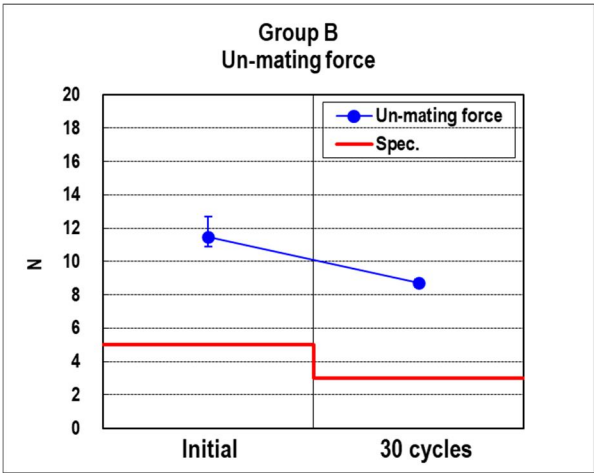
| Group | 試験項目           | 測定項目                      | 規 格           | 試料数 | 単位   | 平均            | 最大  | 最小   | S    | 判定   |
|-------|----------------|---------------------------|---------------|-----|------|---------------|-----|------|------|------|
| G     | 耐衝撃性           |                           |               |     |      |               |     |      |      |      |
|       | 中心導体接触抵抗       |                           |               |     |      |               |     |      |      |      |
|       |                | Initial                   | 20mΩ MAX.     | 10  | mΩ   | 7.30          | 7.7 | 7.0  | 0.27 | Pass |
|       |                | After testing             | -             |     |      | 7.01          | 7.7 | 6.5  | 0.37 | Pass |
|       |                | ΔR                        | ΔR 20mΩ MAX.  |     |      | -0.30         | 0.2 | -1.0 | 0.38 | Pass |
|       | 外部導体接触抵抗       |                           |               |     |      |               |     |      |      |      |
|       |                | Initial                   | 20mΩ MAX.     | 10  | mΩ   | 3.81          | 4.1 | 3.5  | 0.19 | Pass |
|       |                | After testing             | -             |     |      | 4.00          | 4.4 | 3.5  | 0.29 | Pass |
|       |                | ΔR                        | ΔR 100mΩ MAX. |     |      | 0.19          | 0.6 | -0.6 | 0.31 | Pass |
|       | 電流瞬断           |                           |               |     |      |               |     |      |      |      |
|       |                | 規格：試験中、1μsを超える電氣的瞬断の無き事。  |               |     |      |               |     |      |      |      |
|       |                | After testing             | -             | 10  | -    | 瞬断なし          |     |      |      | Pass |
|       | 外観             |                           |               |     |      |               |     |      |      |      |
|       | 規格：機能を損なう異常無き事 |                           |               |     |      |               |     |      |      |      |
|       | Initial        | 異常なし                      | 10            | -   | 異常なし |               |     |      | Pass |      |
|       | After testing  |                           |               |     | 異常なし |               |     |      | Pass |      |
| H     | 湿度（定常状態）       |                           |               |     |      |               |     |      |      |      |
|       | 中心導体接触抵抗       |                           |               |     |      |               |     |      |      |      |
|       |                | Initial                   | 20mΩ MAX.     | 10  | mΩ   | 7.50          | 8.2 | 7.0  | 0.43 | Pass |
|       |                | After testing             | -             |     |      | 7.46          | 9.1 | 6.6  | 0.70 | Pass |
|       |                | ΔR                        | ΔR 20mΩ MAX.  |     |      | -0.04         | 1.0 | -0.7 | 0.47 | Pass |
|       | 外部導体接触抵抗       |                           |               |     |      |               |     |      |      |      |
|       |                | Initial                   | 20mΩ MAX.     | 10  | mΩ   | 4.14          | 4.6 | 3.8  | 0.23 | Pass |
|       |                | After testing             | -             |     |      | 5.17          | 6.5 | 4.6  | 0.52 | Pass |
|       |                | ΔR                        | ΔR 100mΩ MAX. |     |      | 1.03          | 2.0 | 0.5  | 0.46 | Pass |
|       | 絶縁抵抗           |                           |               |     |      |               |     |      |      |      |
|       |                | Initial                   | 500MΩ MIN.    | 10  | MΩ   | 10,000MΩ MIN. |     |      |      | Pass |
|       |                | After testing             | 100MΩ MIN.    |     |      | 10,000MΩ MIN. |     |      |      | Pass |
|       | 耐電圧            |                           |               |     |      |               |     |      |      |      |
|       |                | 規格：沿面放電、空中放電、絶縁破壊等の異常無き事。 |               |     |      |               |     |      |      |      |
|       |                | After testing             | -             | 10  | -    | 異常なし          |     |      |      | Pass |
|       | 外観             |                           |               |     |      |               |     |      |      |      |
|       |                | 規格：機能を損なう異常無き事            |               |     |      |               |     |      |      |      |
|       | Initial        | 異常なし                      | 10            | -   | 異常なし |               |     |      | Pass |      |
|       | After testing  |                           |               |     | 異常なし |               |     |      | Pass |      |
| J     | 熱衝撃            |                           |               |     |      |               |     |      |      |      |
|       | 中心導体接触抵抗       |                           |               |     |      |               |     |      |      |      |
|       |                | Initial                   | 20mΩ MAX.     | 10  | mΩ   | 7.73          | 8.4 | 7.0  | 0.42 | Pass |
|       |                | After testing             | -             |     |      | 7.39          | 8.0 | 7.0  | 0.33 | Pass |
|       |                | ΔR                        | ΔR 20mΩ MAX.  |     |      | -0.34         | 0.2 | -0.8 | 0.31 | Pass |
|       | 外部導体接触抵抗       |                           |               |     |      |               |     |      |      |      |
|       |                | Initial                   | 20mΩ MAX.     | 10  | mΩ   | 4.28          | 4.9 | 3.9  | 0.30 | Pass |
|       |                | After testing             | -             |     |      | 6.12          | 7.2 | 5.1  | 0.73 | Pass |
|       |                | ΔR                        | ΔR 100mΩ MAX. |     |      | 1.84          | 3.0 | 0.2  | 0.90 | Pass |
|       | 絶縁抵抗           |                           |               |     |      |               |     |      |      |      |
|       |                | Initial                   | 500MΩ MIN.    | 10  | MΩ   | 10,000MΩ MIN. |     |      |      | Pass |
|       |                | After testing             | 100MΩ MIN.    |     |      | 10,000MΩ MIN. |     |      |      | Pass |
|       | 耐電圧            |                           |               |     |      |               |     |      |      |      |
|       |                | 規格：沿面放電、空中放電、絶縁破壊等の異常無き事。 |               |     |      |               |     |      |      |      |
|       |                | After testing             | -             | 10  | -    | 異常なし          |     |      |      | Pass |
|       | 外観             |                           |               |     |      |               |     |      |      |      |
|       |                | 規格：機能を損なう異常無き事            |               |     |      |               |     |      |      |      |
|       | Initial        | 異常なし                      | 10            | -   | 異常なし |               |     |      | Pass |      |
|       | After testing  |                           |               |     | 異常なし |               |     |      | Pass |      |

Table 2-3

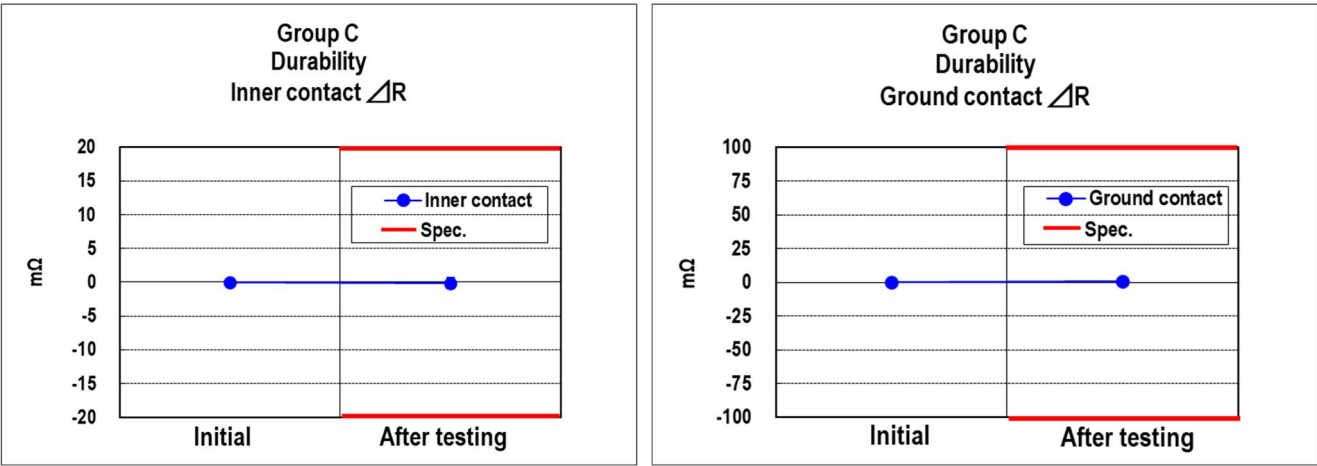
| Group | 試験項目           | 測定項目                                                 | 規 格           | 試料数 | 単位   | 平均    | 最大  | 最小   | S    | 判定   |
|-------|----------------|------------------------------------------------------|---------------|-----|------|-------|-----|------|------|------|
| K     | 高温寿命           |                                                      |               |     |      |       |     |      |      |      |
|       | 中心導体接触抵抗       |                                                      |               |     |      |       |     |      |      |      |
|       |                | Initial                                              | 20mΩ MAX.     | 10  | mΩ   | 7.74  | 8.2 | 7.3  | 0.31 | Pass |
|       |                | After testing                                        | -             |     |      | 7.02  | 7.6 | 6.4  | 0.43 | Pass |
|       |                | ΔR                                                   | ΔR 20mΩ MAX.  |     |      | -0.73 | 0.0 | -1.3 | 0.46 | Pass |
|       | 外部導体接触抵抗       |                                                      |               |     |      |       |     |      |      |      |
|       |                | Initial                                              | 20mΩ MAX.     | 10  | mΩ   | 4.25  | 4.6 | 3.9  | 0.23 | Pass |
|       |                | After testing                                        | -             |     |      | 4.34  | 4.8 | 4.0  | 0.23 | Pass |
|       |                | ΔR                                                   | ΔR 100mΩ MAX. |     |      | 0.09  | 0.7 | -0.4 | 0.34 | Pass |
|       | 外観             |                                                      |               |     |      |       |     |      |      |      |
|       | 規格：機能を損なう異常無き事 |                                                      |               |     |      |       |     |      |      |      |
|       | Initial        | 異常なし                                                 | 10            | -   | 異常なし |       |     |      | Pass |      |
|       | After testing  |                                                      |               |     | 異常なし |       |     |      | Pass |      |
| L     | 硫化水素ガス         |                                                      |               |     |      |       |     |      |      |      |
|       | 中心導体接触抵抗       |                                                      |               |     |      |       |     |      |      |      |
|       |                | Initial                                              | 20mΩ MAX.     | 10  | mΩ   | 7.71  | 8.7 | 6.4  | 0.66 | Pass |
|       |                | After testing                                        | -             |     |      | 7.05  | 8.2 | 6.3  | 0.64 | Pass |
|       |                | ΔR                                                   | ΔR 20mΩ MAX.  |     |      | -0.65 | 0.3 | -1.2 | 0.47 | Pass |
|       | 外部導体接触抵抗       |                                                      |               |     |      |       |     |      |      |      |
|       |                | Initial                                              | 20mΩ MAX.     | 10  | mΩ   | 4.08  | 5.0 | 3.1  | 0.47 | Pass |
|       |                | After testing                                        | -             |     |      | 4.86  | 5.3 | 4.2  | 0.37 | Pass |
|       |                | ΔR                                                   | ΔR 100mΩ MAX. |     |      | 0.78  | 1.4 | 0.0  | 0.42 | Pass |
|       | 外観             |                                                      |               |     |      |       |     |      |      |      |
|       | 規格：機能を損なう異常無き事 |                                                      |               |     |      |       |     |      |      |      |
|       | After testing  | 異常なし                                                 | 10            | -   | 異常なし |       |     |      | Pass |      |
| M     | 塩水噴霧           |                                                      |               |     |      |       |     |      |      |      |
|       | 中心導体接触抵抗       |                                                      |               |     |      |       |     |      |      |      |
|       |                | Initial                                              | 20mΩ MAX.     | 10  | mΩ   | 7.51  | 8.0 | 6.8  | 0.37 | Pass |
|       |                | After testing                                        | -             |     |      | 7.46  | 8.5 | 6.7  | 0.61 | Pass |
|       |                | ΔR                                                   | ΔR 20mΩ MAX.  |     |      | -0.05 | 1.2 | -1.1 | 0.75 | Pass |
|       | 外部導体接触抵抗       |                                                      |               |     |      |       |     |      |      |      |
|       |                | Initial                                              | 20mΩ MAX.     | 10  | mΩ   | 4.15  | 4.5 | 3.6  | 0.25 | Pass |
|       |                | After testing                                        | -             |     |      | 5.41  | 6.2 | 4.6  | 0.45 | Pass |
|       |                | ΔR                                                   | ΔR 100mΩ MAX. |     |      | 1.26  | 2.0 | 0.6  | 0.45 | Pass |
|       | 外観             |                                                      |               |     |      |       |     |      |      |      |
|       | 規格：機能を損なう異常無き事 |                                                      |               |     |      |       |     |      |      |      |
|       | After testing  | 異常なし                                                 | 10            | -   | 異常なし |       |     |      | Pass |      |
| N     | 半田付け性          |                                                      |               |     |      |       |     |      |      |      |
|       |                | 規格：規格：浸した面積の95%以上に半田が付着し、かつピンホール空隙が1箇所に集中せず、5%以下である事 |               |     |      |       |     |      |      |      |
|       | After testing  | -                                                    | 10            | -   | 異常なし |       |     |      | Pass |      |
| P     | 半田耐熱性          |                                                      |               |     |      |       |     |      |      |      |
|       | 外観             |                                                      |               |     |      |       |     |      |      |      |
|       |                | 規格：機能を損なう変形及び、欠陥の無い事。                                |               |     |      |       |     |      |      |      |
|       | After testing  | -                                                    | 10            | -   | 異常なし |       |     |      | Pass |      |



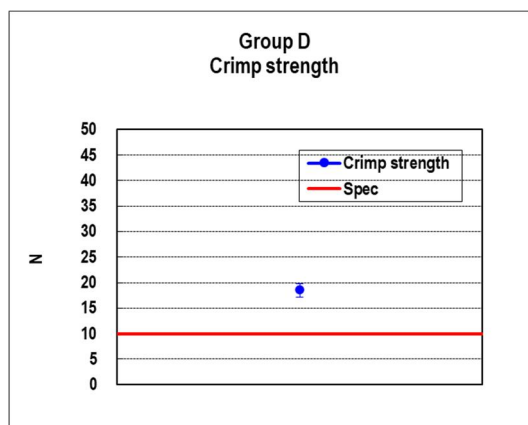
Graph 1 VSWR



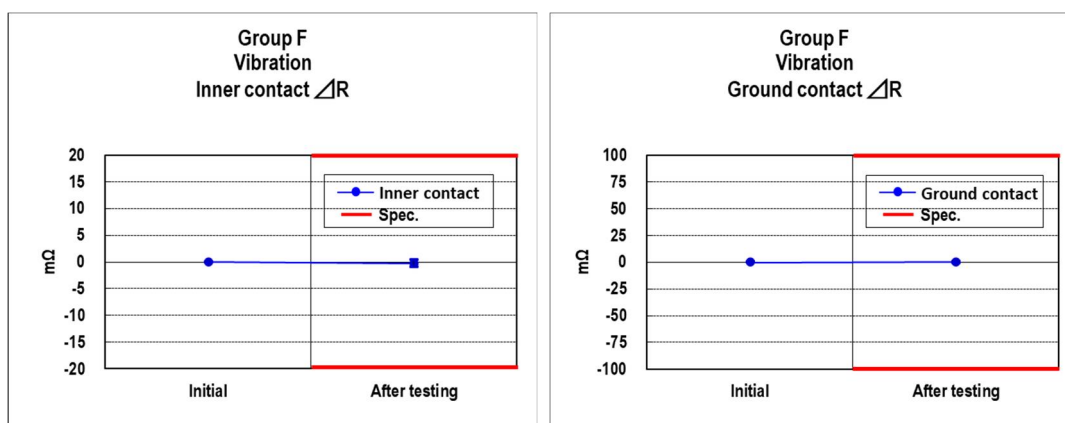
Graph 2 抜去力



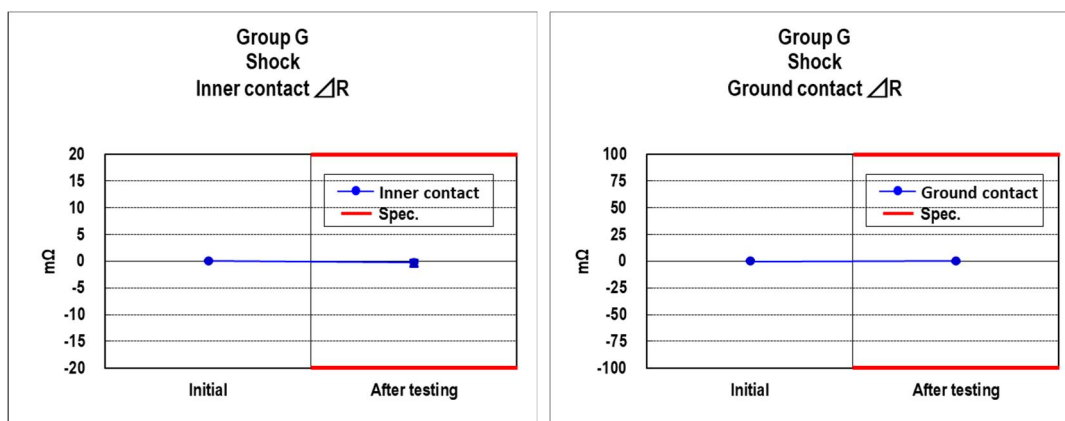
Graph 3 耐久性



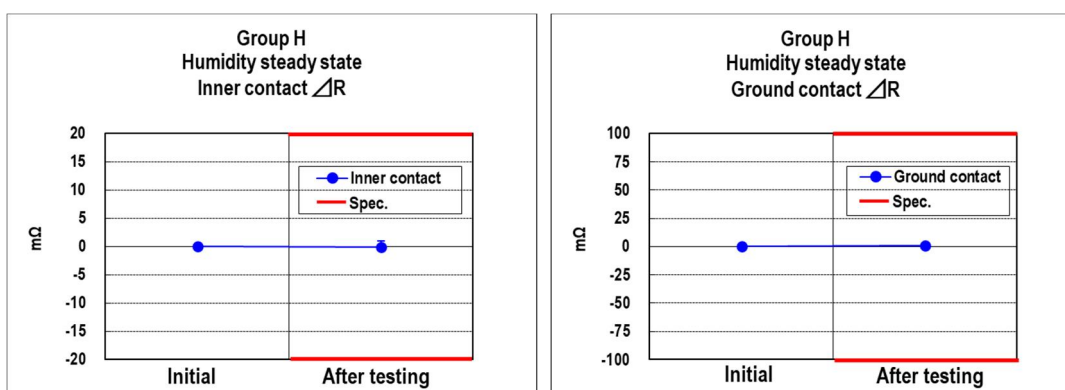
Graph 4 引張り強度



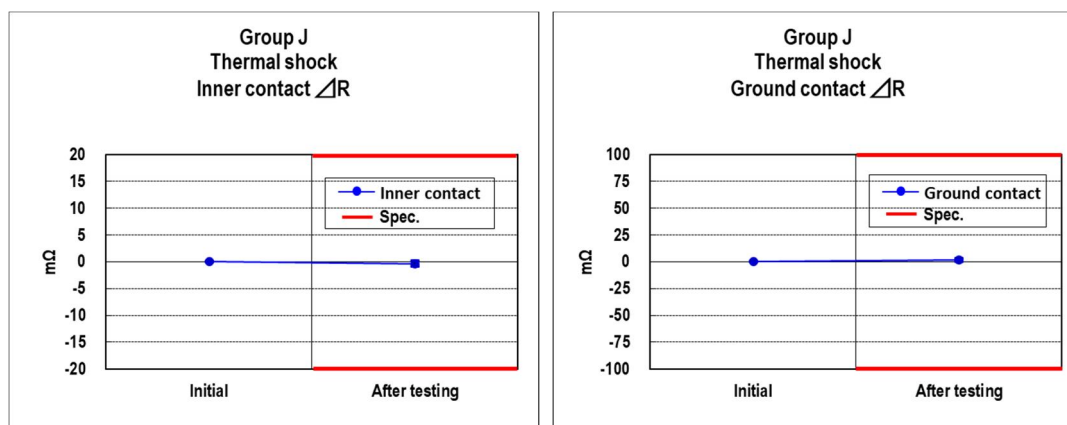
Graph 5 耐振動性



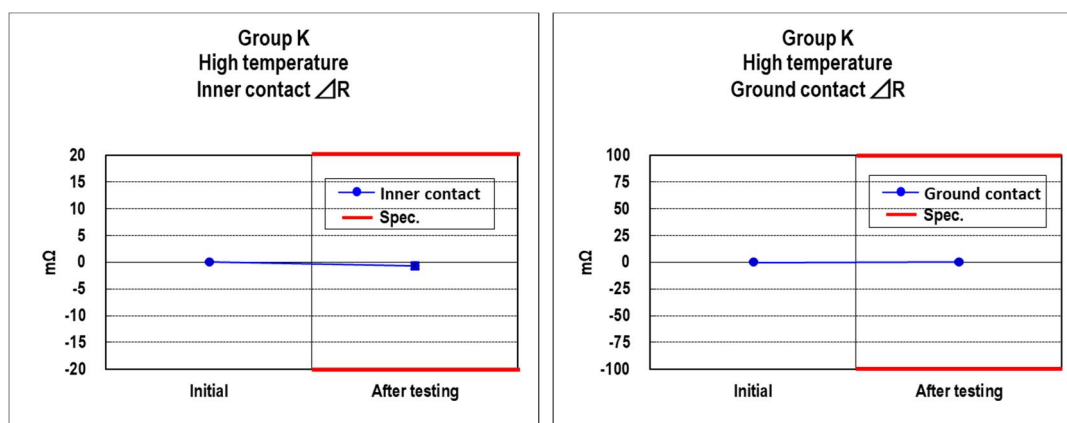
Graph 6 耐衝撃性



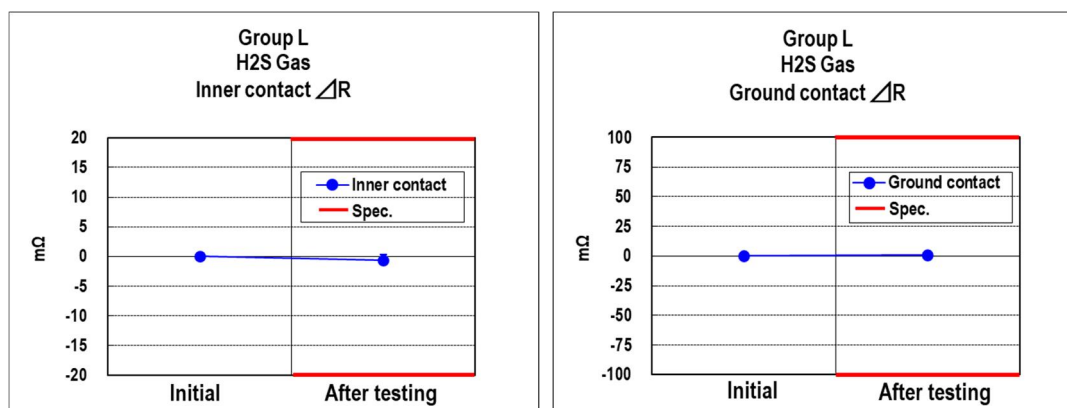
Graph 7 湿度 (定常状態)



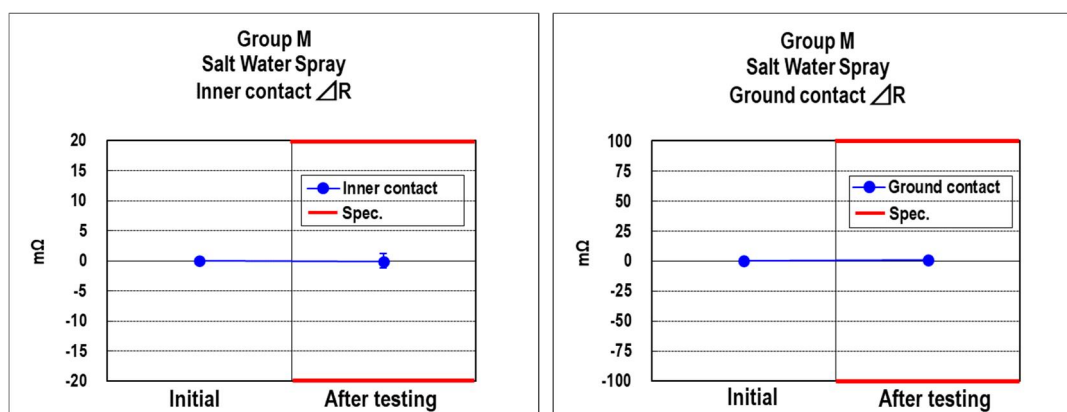
Graph 8 熱衝撃



Graph 9 高温寿命



Graph 10 硫化水素ガス



Graph 11 塩水噴霧