

# MHF<sup>®</sup> I Connector

Ground contact gold plating  
(Anti-static reel version)

Part No. Plug: 20351-1\*\*R-37 Receptacle: 20279-001E-0\*

## Test Report

Product Specification no. PRS-1726

|      |        |                   |              |             |              |
|------|--------|-------------------|--------------|-------------|--------------|
| 6    | T20093 | November 10, 2020 | S.Taguchi    | J.Tonai     | M.Takemoto   |
| 5    | T19085 | July 30, 2019     | R. Takahashi | T. Yamauchi | Y. Shimada   |
| 4    | T17141 | August 31, 2017   | M. Abe       | -           | T. Matsumoto |
| 3    | T17081 | May 15, 2017      | M. Nomoto    | -           | K. Yotsutani |
| Rev. | ECN    | Date              | Prepared by  | Checked by  | Approved by  |

## 1. Purpose

To evaluate the performance of MHF I Connector in accordance with PRS-1726.

## 2. Specimen

- (1) MHF I PLUG (Part No. 20351-112R-37)
- (2) MHF I RECEPTACLE (Part No. 20279-001E-0\*)

## 3. Test Sequence

All the evaluations were performed in accordance with Table 1. Test Sequence.

## 4. Result

See Table 1 to 2, Graph 1 to 9. For the details of the testing conditions and requirements, see PRS-1726.  
The "n" in the tables show the number of measurement points.

## 5. Conclusion

All the specimens met the requirements of PRS-1726.

**Table 1 Test Sequence and Sample Quantity**

| Test Item                       | Group |   |    |    |     |     |     |     |     |     |    |     |    |    |
|---------------------------------|-------|---|----|----|-----|-----|-----|-----|-----|-----|----|-----|----|----|
|                                 | A     | B | C  | D  | E   | F   | G   | H   | J   | K   | L  | M   | N  | P  |
| Contact Resistance              |       |   |    |    | 1,3 | 1,3 | 1,3 | 1,3 | 1,4 | 1,4 |    | 1,3 |    |    |
| Insulation Resistance           |       |   |    |    |     |     |     |     | 2,5 | 2,5 |    |     |    |    |
| Dielectric Withstanding Voltage | 1     |   |    |    |     |     |     |     |     |     |    |     |    |    |
| VSWR                            |       | 1 |    |    |     |     |     |     |     |     |    |     |    |    |
| Unmating Force                  |       |   | 1  |    |     |     |     |     |     |     |    |     |    |    |
| Crimp Strength                  |       |   |    | 1  |     |     |     |     |     |     |    |     |    |    |
| Durability                      |       |   |    |    | 2   |     |     |     |     |     |    |     |    |    |
| Cable Retention Force           |       |   |    |    |     | 2   |     |     |     |     |    |     |    |    |
| Vibration                       |       |   |    |    |     |     | 2   |     |     |     |    |     |    |    |
| Shock                           |       |   |    |    |     |     |     | 2   |     |     |    |     |    |    |
| Thermal Shock                   |       |   |    |    |     |     |     |     | 3   |     |    |     |    |    |
| Humidity (Steady State)         |       |   |    |    |     |     |     |     |     | 3   |    |     |    |    |
| Salt Water Spray                |       |   |    |    |     |     |     |     |     |     | 1  |     |    |    |
| High Temperature Life           |       |   |    |    |     |     |     |     |     |     |    | 2   |    |    |
| Solder ability                  |       |   |    |    |     |     |     |     |     |     |    |     | 1  |    |
| Soldering Heat Resistance       |       |   |    |    |     |     |     |     |     |     |    |     |    | 1  |
| Sample Quantity                 | 10    | 5 | 10 | 10 | 10  | 10  | 10  | 10  | 10  | 10  | 10 | 10  | 10 | 10 |

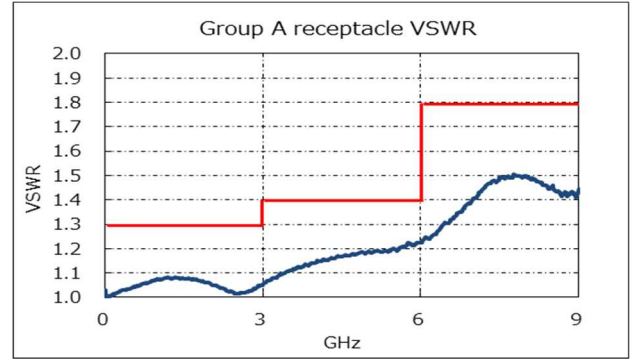
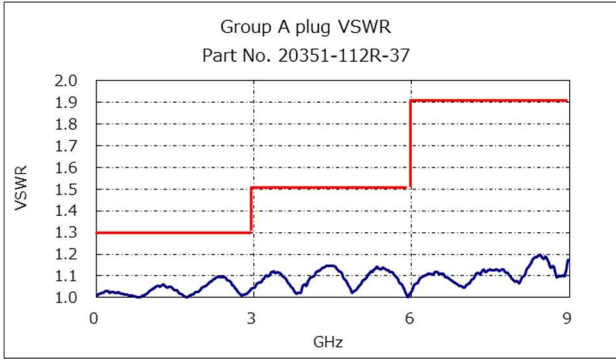
※Numbers indicate test sequences

Table 2 Test result

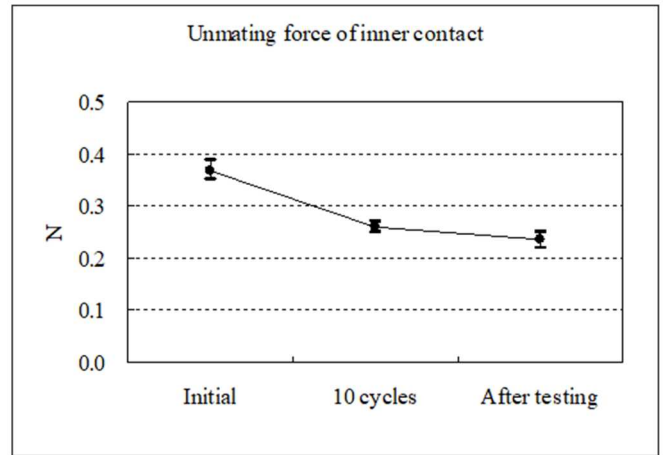
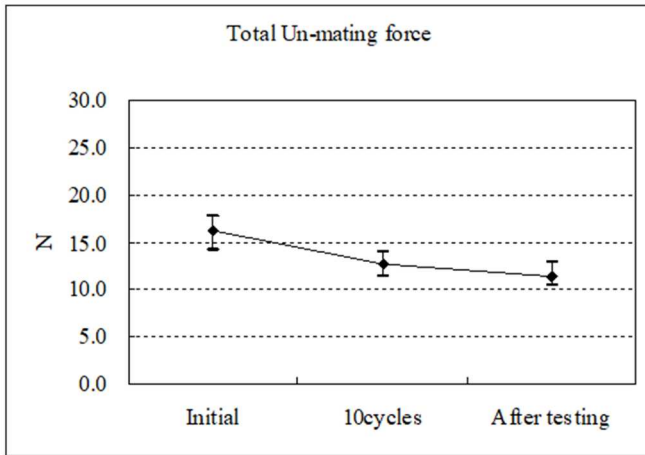
| Group           | Test items  |            | Specification | n              | Unit           | AVE.           | MAX.  | MIN.  | S    | Judgement |
|-----------------|---|------------|---------------|----------------|----------------|----------------|-------|-------|------|-----------|
|                 | Measurements  |            |               |                |                |                |       |       |      |           |
| A               | Dielectric withstanding voltage   |            |               |                |                |                |       |       |      |           |
|                 | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. |            |               |                |                |                |       |       |      |           |
|                 | -   | -          | -             | 10             | -              | No abnormality |       |       |      | Pass      |
| B               | VSWR  |            |               |                |                |                |       |       |      |           |
|                 | Plug  |            |               |                |                |                |       |       |      |           |
|                 | 0.1~3.0GHz  | 1.3 MAX.   | 5             | -              | 1.091          | 1.11           | 1.08  | 0.010 | Pass |           |
|                 | 3.0~6.0GHz  | 1.5 MAX.   |               | -              | 1.157          | 1.17           | 1.15  | 0.007 | Pass |           |
|                 | 6.0~9.0GHz  | 1.9 MAX.   |               | -              | 1.204          | 1.25           | 1.17  | 0.029 | Pass |           |
|                 | Receptacle  |            |               |                |                |                |       |       |      |           |
|                 | 0.1~3.0GHz  | 1.3 MAX.   | 5             | -              | 1.085          | 1.09           | 1.08  | 0.006 | Pass |           |
| 3.0~6.0GHz      | 1.5 MAX.  | -          |               | 1.233          | 1.27           | 1.18           | 0.033 | Pass  |      |           |
| 6.0~9.0GHz      | 1.8 MAX.  | -          |               | 1.515          | 1.60           | 1.41           | 0.068 | Pass  |      |           |
| C               | Total unmating force  |            |               |                |                |                |       |       |      |           |
|                 | Initial   | 5N MIN.    | 10            | N              | 16.30          | 17.7           | 14.2  | 1.20  | Pass |           |
|                 | After 30 cycles   | 3N MIN.    |               |                | 11.34          | 12.8           | 10.4  | 0.72  | Pass |           |
|                 | Unmating force of inner contact   |            |               |                |                |                |       |       |      |           |
|                 | Initial   | 0.15N MIN. | 10            | N              | 0.368          | 0.39           | 0.35  | 0.012 | Pass |           |
| After 30 cycles | 0.1N MIN.   | 0.238      |               |                | 0.25           | 0.22           | 0.010 | Pass  |      |           |
| D               | Crimp strength  |            |               |                |                |                |       |       |      |           |
|                 | -   | 15N MIN.   | 10            | N              | 24.34          | 25.7           | 22.6  | 1.29  | Pass |           |
| E               | Durability  |            |               |                |                |                |       |       |      |           |
|                 | Contact resistance of main contact  |            |               |                |                |                |       |       |      |           |
|                 | Initial   | 20mΩ MAX.  | 10            | mΩ             | 6.19           | 6.9            | 5.3   | 0.59  | Pass |           |
|                 | After 30 cycles   | 25mΩ MAX.  |               |                | 7.11           | 8.0            | 6.2   | 0.58  | Pass |           |
|                 | Contact resistance of ground contact  |            |               |                |                |                |       |       |      |           |
|                 | Initial   | 10mΩ MAX.  | 10            | mΩ             | 4.63           | 5.7            | 4.0   | 0.57  | Pass |           |
| After 30 cycles | 15mΩ MAX.   | 6.34       |               |                | 6.9            | 5.0            | 0.58  | Pass  |      |           |
| F               | Cable retention force   |            |               |                |                |                |       |       |      |           |
|                 | Contact resistance of main contact  |            |               |                |                |                |       |       |      |           |
|                 | Initial   | 20mΩ MAX.  | 10            | mΩ             | 6.15           | 6.9            | 5.7   | 0.36  | Pass |           |
|                 | After testing   | 25mΩ MAX.  |               |                | 7.18           | 7.8            | 6.3   | 0.50  | Pass |           |
|                 | Contact resistance of ground contact  |            |               |                |                |                |       |       |      |           |
|                 | Initial   | 10mΩ MAX.  | 10            | mΩ             | 5.36           | 6.0            | 4.5   | 0.57  | Pass |           |
|                 | After testing   | 15mΩ MAX.  |               |                | 6.15           | 6.9            | 5.6   | 0.42  | Pass |           |
|                 | Electrical discontinuity  |            |               |                |                |                |       |       |      |           |
|                 | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. |            |               |                |                |                |       |       |      |           |
|                 | -   | -          | 10            | -              | No abnormality |                |       |       | Pass |           |
| Appearance      |   |            |               |                |                |                |       |       |      |           |
| Initial         | No abnormality  | 10         | -             | No abnormality |                |                |       | Pass  |      |           |
| After testing   |   |            |               | No abnormality |                |                |       | Pass  |      |           |

| Group         | Test items  | Specification  | n  | Unit | AVE.           | MAX. | MIN. | S    | Judgement |
|---------------|---|----------------|----|------|----------------|------|------|------|-----------|
|               | Measurements  |                |    |      |                |      |      |      |           |
| G             | Vibration   |                |    |      |                |      |      |      |           |
|               | Contact resistance of main contact  |                |    |      |                |      |      |      |           |
|               | Initial   | 20mΩ MAX.      | 10 | mΩ   | 5.54           | 6.6  | 5.0  | 0.59 | Pass      |
|               | After testing   | 25mΩ MAX.      |    |      | 6.82           | 7.9  | 6.0  | 0.73 | Pass      |
|               | Contact resistance of ground contact  |                |    |      |                |      |      |      |           |
|               | Initial   | 10mΩ MAX.      | 10 | mΩ   | 5.13           | 6.0  | 4.0  | 0.69 | Pass      |
|               | After testing   | 15mΩ MAX.      |    |      | 6.24           | 6.9  | 5.5  | 0.51 | Pass      |
|               | Electrical discontinuity  |                |    |      |                |      |      |      |           |
|               | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. |                |    |      |                |      |      |      |           |
|               | -   | -              | 10 | -    | No abnormality |      |      |      | Pass      |
|               | Appearance  |                |    |      |                |      |      |      |           |
|               | Initial   | No abnormality | 10 | -    | No abnormality |      |      |      | Pass      |
| After testing | No abnormality  |                |    |      | Pass           |      |      |      |           |
| H             | Shock   |                |    |      |                |      |      |      |           |
|               | Contact resistance of main contact  |                |    |      |                |      |      |      |           |
|               | Initial   | 20mΩ MAX.      | 10 | mΩ   | 5.54           | 6.6  | 5.0  | 0.59 | Pass      |
|               | After testing   | 25mΩ MAX.      |    |      | 7.01           | 7.7  | 6.1  | 0.51 | Pass      |
|               | Contact resistance of ground contact  |                |    |      |                |      |      |      |           |
|               | Initial   | 10mΩ MAX.      | 10 | mΩ   | 4.79           | 5.8  | 4.1  | 0.58 | Pass      |
|               | After testing   | 15mΩ MAX.      |    |      | 6.06           | 6.8  | 5.0  | 0.72 | Pass      |
|               | Electrical discontinuity  |                |    |      |                |      |      |      |           |
|               | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. |                |    |      |                |      |      |      |           |
|               | -   | -              | 10 | -    | No abnormality |      |      |      | Pass      |
|               | Appearance  |                |    |      |                |      |      |      |           |
|               | Initial   | No abnormality | 10 | -    | No abnormality |      |      |      | Pass      |
| After testing | No abnormality  |                |    |      | Pass           |      |      |      |           |
| J             | Thermal shock   |                |    |      |                |      |      |      |           |
|               | Contact resistance of main contact  |                |    |      |                |      |      |      |           |
|               | Initial   | 20mΩ MAX.      | 10 | mΩ   | 5.91           | 6.4  | 5.0  | 0.44 | Pass      |
|               | After testing   | 25mΩ MAX.      |    |      | 6.95           | 8.0  | 6.4  | 0.53 | Pass      |
|               | Contact resistance of ground contact  |                |    |      |                |      |      |      |           |
|               | Initial   | 10mΩ MAX.      | 10 | mΩ   | 5.24           | 6.0  | 4.2  | 0.62 | Pass      |
|               | After testing   | 15mΩ MAX.      |    |      | 6.08           | 6.9  | 5.0  | 0.63 | Pass      |
|               | Insulation residence  |                |    |      |                |      |      |      |           |
|               | Initial   | 500MΩ MIN.     | 10 | MΩ   | 10,000MΩ MIN.  |      |      |      | Pass      |
|               | After testing   | 100MΩ MIN.     |    |      | 10,000MΩ MIN.  |      |      |      | Pass      |
|               | Appearance  |                |    |      |                |      |      |      |           |
|               | Initial   | No abnormality | 10 | -    | No abnormality |      |      |      | Pass      |
| After testing | No abnormality  |                |    |      | Pass           |      |      |      |           |

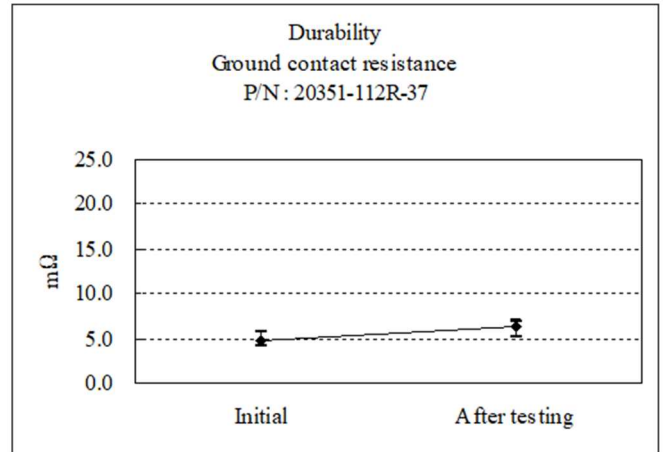
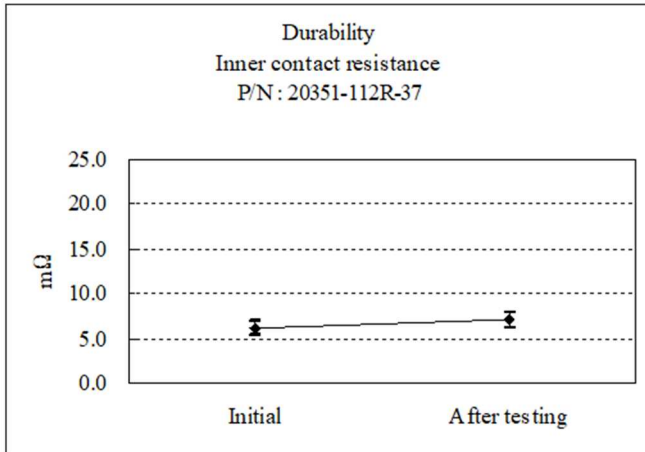
| Group         | Test items  | Specification  | n  | Unit           | AVE.           | MAX. | MIN. | S    | Judgement |
|---------------|---|----------------|----|----------------|----------------|------|------|------|-----------|
| K             | Humidity(Steady State)  |                |    |                |                |      |      |      |           |
|               | Measurements  |                |    |                |                |      |      |      |           |
|               | Contact resistance of main contact                                    |                |    |                |                |      |      |      |           |
|               | Initial   | 20mΩ MAX.      | 10 | mΩ             | 6.38           | 7.0  | 5.7  | 0.46 | Pass      |
|               | After testing   | 25mΩ MAX.      |    |                | 7.14           | 7.9  | 6.1  | 0.66 | Pass      |
|               | Contact resistance of ground contact                                  |                |    |                |                |      |      |      |           |
|               | Initial   | 10mΩ MAX.      | 10 | mΩ             | 5.13           | 5.8  | 4.3  | 0.60 | Pass      |
|               | After testing   | 15mΩ MAX.      |    |                | 6.15           | 7.0  | 5.4  | 0.59 | Pass      |
|               | Insulation residence  |                |    |                |                |      |      |      |           |
|               | Initial   | 500MΩ MIN.     | 10 | MΩ             | 10,000MΩ MIN.  |      |      |      | Pass      |
|               | After testing   | 100MΩ MIN.     |    |                | 10,000MΩ MIN.  |      |      |      | Pass      |
|               | Appearance  |                |    |                |                |      |      |      |           |
| Initial       | No abnormality  | 10             | -  | No abnormality |                |      |      | Pass |           |
| After testing | No abnormality  |                |    | No abnormality |                |      |      | Pass |           |
| L             | Salt water spray  |                |    |                |                |      |      |      |           |
|               | Appearance  |                |    |                |                |      |      |      |           |
|               | Initial   | No abnormality | 10 | -              | No abnormality |      |      |      | Pass      |
|               | After testing   |                |    |                | No abnormality |      |      |      | Pass      |
| M             | High Temperature Life   |                |    |                |                |      |      |      |           |
|               | Contact resistance of main contact                                    |                |    |                |                |      |      |      |           |
|               | Initial   | 20mΩ MAX.      | 10 | mΩ             | 5.91           | 6.8  | 5.1  | 0.52 | Pass      |
|               | After testing   | 25mΩ MAX.      |    |                | 7.42           | 8.0  | 6.8  | 0.40 | Pass      |
|               | Contact resistance of ground contact                                  |                |    |                |                |      |      |      |           |
|               | Initial   | 10mΩ MAX.      | 10 | mΩ             | 5.03           | 5.7  | 4.1  | 0.60 | Pass      |
|               | After testing   | 15mΩ MAX.      |    |                | 5.86           | 6.7  | 5.1  | 0.59 | Pass      |
|               | Appearance  |                |    |                |                |      |      |      |           |
|               | Initial   | No abnormality | 10 | -              | No abnormality |      |      |      | Pass      |
|               | After testing   |                |    |                | No abnormality |      |      |      | Pass      |
| N             | Solder ability  |                |    |                |                |      |      |      |           |
|               | Spec: More than 95% of the dipped surface shall be evenly wet.        |                |    |                |                |      |      |      |           |
|               | After testing   | -              | 10 | -              | No abnormality |      |      |      | Pass      |
| P             | Reflow soldering heat resistance                                      |                |    |                |                |      |      |      |           |
|               | Appearance  |                |    |                |                |      |      |      |           |
|               | Spec: No abnormality adversely affecting the performance shall occur. |                |    |                |                |      |      |      |           |
| After testing | -   | 10             | -  | No abnormality |                |      |      | Pass |           |



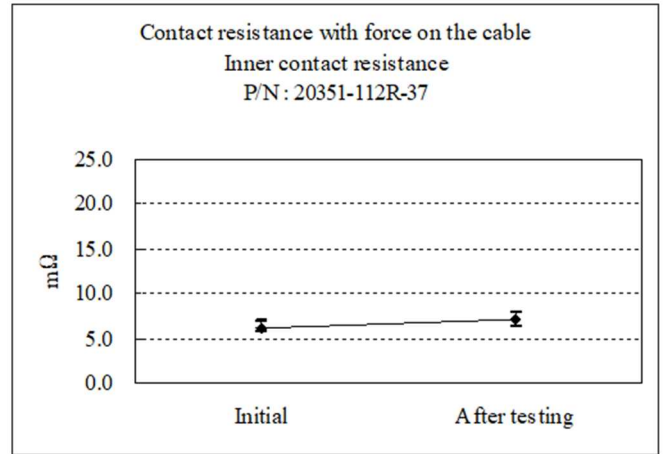
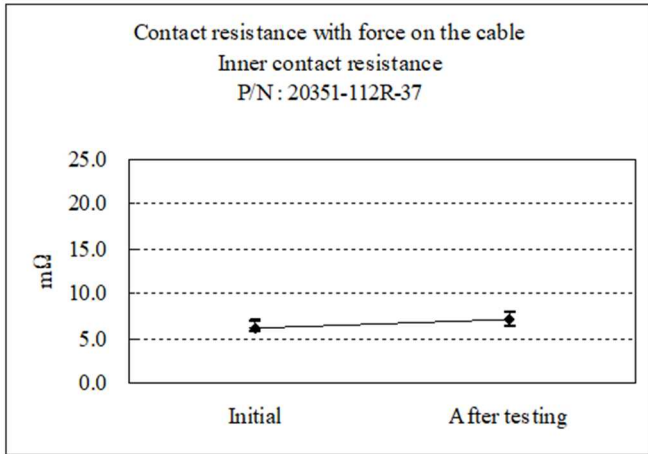
(Graph 1) VSWR



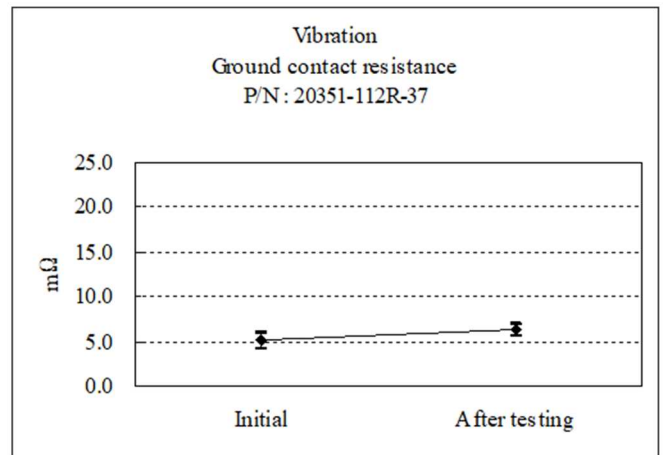
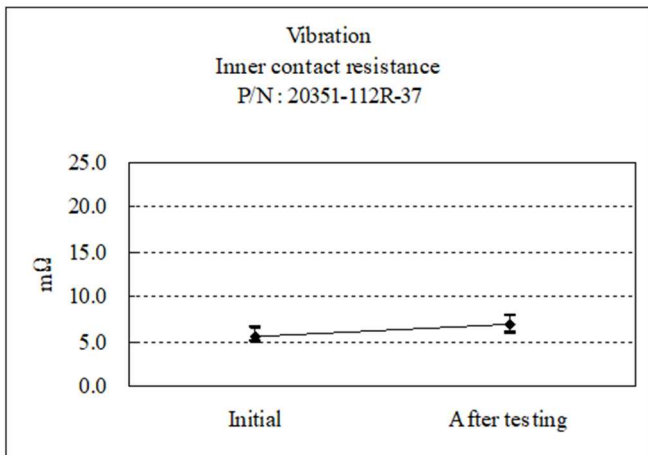
(Graph 2) Unmating force



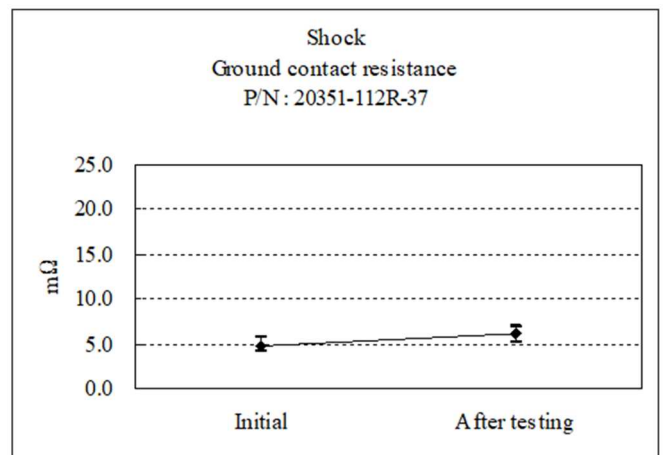
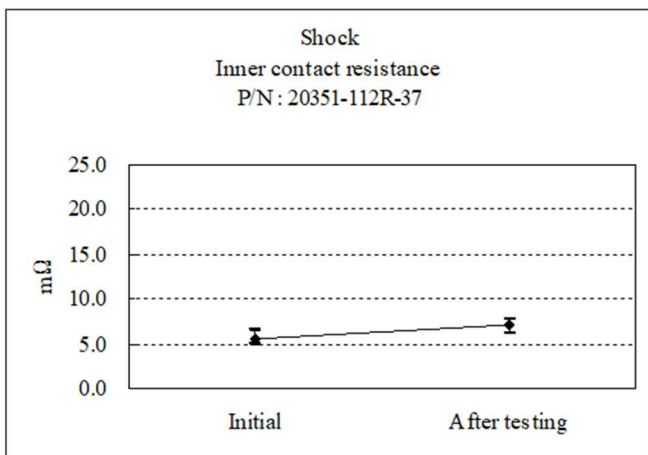
(Graph 3) Durability



(Graph 4) Cable Retention Force

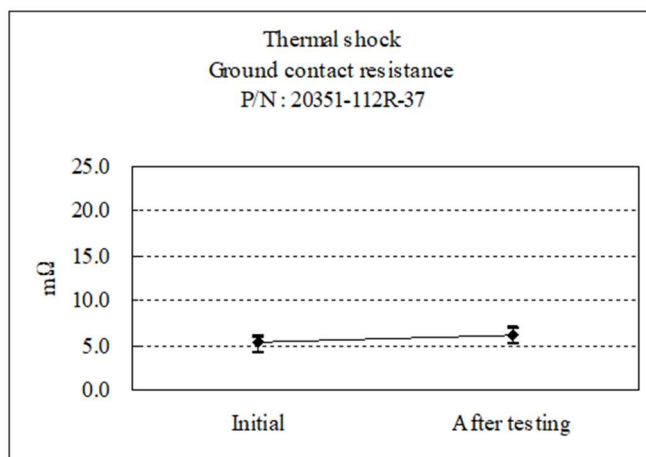
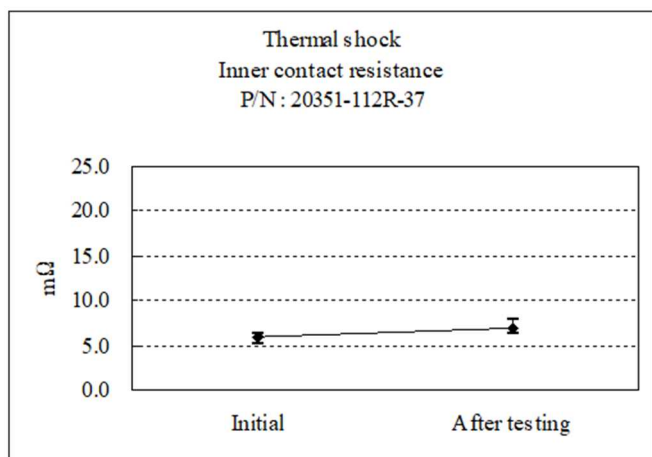


(Graph 5) Vibration

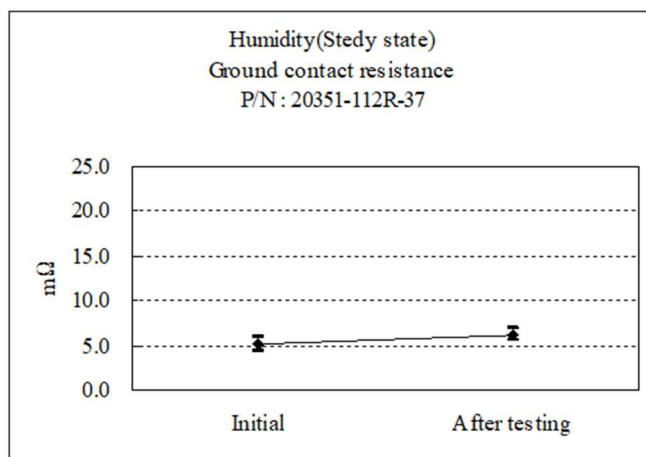
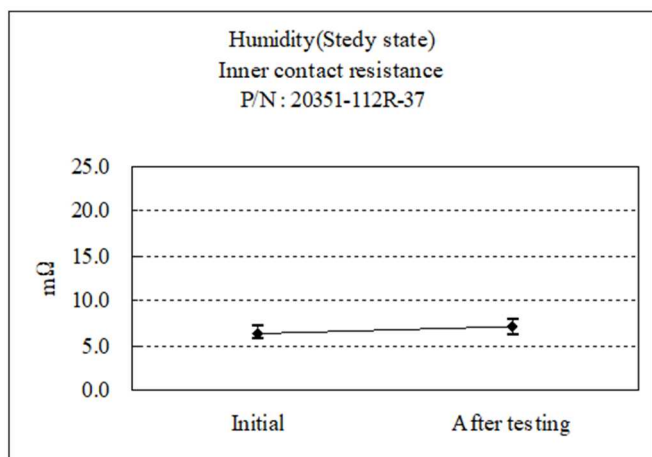


(Graph 6) Shock

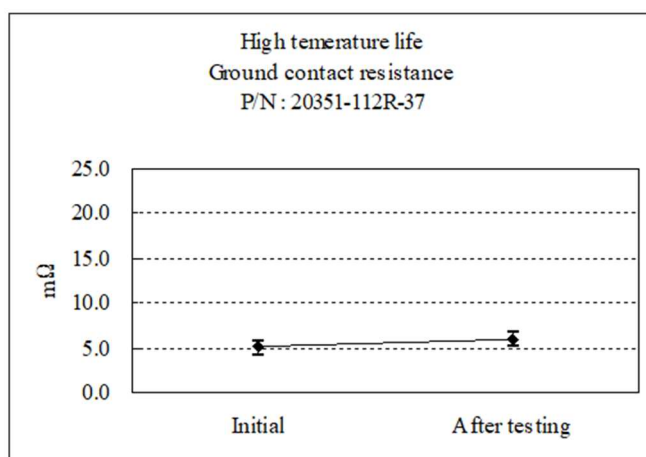
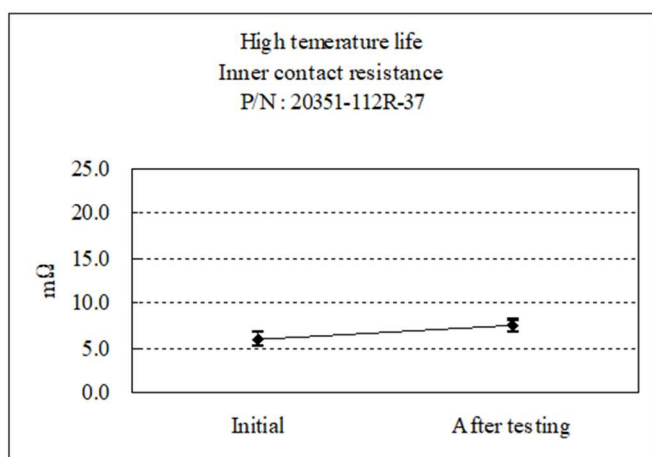




(Graph 7) Thermal Shock



(Graph 8) Humidity (Steady State)



(Graph 9) High Temperature Life