# CABLINE®-VS II

Part No. Plug: 20846-0**T-01, Receptacle: 20849-0**E-01

## Test Report

Product Specification No. PRS-2398

| Rev. | ECN | Date | Prepared by | Checked by | Approved by |
|---|---|---|---|---|---|
| 5 | T22034 | February 4, 2022 | M.Nakamura | T.Masunaga | H.Ikari |
| 4 | T21129 | October 29, 2021 | T.Ono | T.Masunaga | H.Ikari |
| 3 | T20048 | July 23, 2020 | T.Ono | T.Masunaga | H.Ikari |
| 2 | T19136 | October 3, 2019 | R.Morita | T.Masunaga | H.Ikari |

**1. Purpose**

To evaluate the performance of CABLINE-VS II Connector in accordance with PRS-2398.

**2. Specimen**

(1) CABLINE-VSII PLUG ASS'Y （Part No. 20846-0**T-01）
(2) CABLINE-VSII RECEPTACLE ASS'Y （Part No. 20849-0**E-01）

**3. Test Sequence**

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

**4. Result**

See Table 2-1 to 2-3, Graph 1 to 18. For the details of the testing conditions and requirements, see PRS-2398.
The “n” in the tables show the number of measurement points.

**5. Conclusion**

All the specimens met the requirements of PRS-2398.

**Table 1 Test Sequence and Sample Quantity**

| Test Item | Group | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M | N |
| Contact Resistance | 2,6 | | | 1,3,5 | 1,3 | 1,3 | 1,5 | 1,5,7 | 1,3 | 1,3 | | | |
| Insulation Resistance | | | | | | | 2,6 | 2,8 | | | | | |
| D. W. Voltage | | | | | | | 3,7 | 3,9 | | | | | |
| Temperature rising | | | | | | | | | | | | | 1 |
| Mating Force | 1,5 | | | | | | | | | | | | |
| Un-mating Force | 3,7 | | | | | | | | | | | | |
| Durability | 4 | | | | | | | 4 (10cycles) | | | | | |
| Contact Retention Force | | 1,3 | | | | | | | | | | | |
| Conn.Lock | | | 1 | | | | | | | | | | |
| Cable Retention Force | 8 | | | | | | | | | | | | |
| Vibration | | | | 2 | | | | | | | | | |
| Shock | | | | 4 | | | | | | | | | |
| Thermal Shock | | | | | 2 | | | | | | | | |
| High Temperature Life | | 2 | | | | 2 | | | | | | | |
| Humidity (Steady State) | | | | | | | 4 | | | | | | |
| Humidity (Cycling) | | | | | | | | 6 | | | | | |
| Salt Water Spray | | | | | | | | | 2 | | | | |
| $H_2S$ Gas | | | | | | | | | | 2 | | | |
| Solder ability | | | | | | | | | | | 1 | | |
| Soldering Heat Resistance | | | | | | | | | | | | 1 | |
| Specimen Quantity. | 5 pcs. | 20 pcs. | 5 pcs. | 5 pcs. | 5 pcs. | 5 pcs. | 5 pcs. | 5 pcs. | 5 pcs. | 5 pcs. | 10 pcs. | 10 pcs. | 5 pcs. |

※Numbers indicate test sequences

Table.2-1 Test result

| Test Item | Contents of Measurement | | | Specifications | Set | n | Data | | | | | Judge |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | AVE. | MAX. | MIN. | s | X±3s | |
| A Group Durability Cable Retention Force | Contact Resistance (mΩ) | | Initial | AWG#36 275mΩMAX. | 5 | 150 | 213.88 | 218.77 | 210.55 | 1.715 | 219.025 | OK |
| | | | After Testing | AWG#36 ΔR=40mΩ MAX. | | | -0.229 | 3.11 | -3.50 | 1.140 | 3.191 | OK |
| | GND Resistance (mΩ) | | Initial | 50mΩMAX. | 5 | 5 | 9.306 | 9.62 | 8.71 | 0.372 | 10.422 | OK |
| | | | After Testing | ΔR=40mΩ MAX. | | | -0.412 | 0.18 | -0.94 | 0.486 | 1.046 | OK |
| | 20P | Mating Force (N) | Initial | 9.70N MAX. | 5 | 5 | 5.216 | 5.76 | 4.87 | 0.348 | 6.260 | OK |
| | | | After Testing | 9.70N MAX. | | | 3.798 | 3.93 | 3.64 | 0.138 | 4.212 | OK |
| | | Unmating Force (N) | Initial | 2.00N MIN. | 5 | 5 | 3.572 | 3.76 | 3.30 | 0.171 | 3.059 | OK |
| | | | After Testing | 2.00N MIN. | | | 3.170 | 3.54 | 2.85 | 0.251 | 2.417 | OK |
| | | Cable Retention Force | | 9.80N MIN. | 5 | 5 | 129.350 | 133.24 | 122.57 | 4.174 | 116.828 | OK |
| | 30P | Mating Force (N) | Initial | 14.55N MAX. | 5 | 5 | 6.890 | 7.00 | 6.65 | 0.137 | 7.301 | OK |
| | | | After Testing | 14.55N MAX. | | | 4.758 | 4.98 | 4.43 | 0.246 | 5.496 | OK |
| | | Unmating Force (N) | Initial | 3.00N MIN. | 5 | 5 | 4.516 | 4.65 | 4.39 | 0.092 | 4.240 | OK |
| | | | After Testing | 3.00N MIN. | | | 4.006 | 4.30 | 3.64 | 0.258 | 3.232 | OK |
| | | Cable Retention Force | | 14.70N MIN. | 5 | 5 | 128.068 | 134.23 | 121.18 | 6.115 | 109.723 | OK |
| | 40P | Mating Force (N) | Initial | 19.40N MAX. | 5 | 5 | 9.298 | 9.84 | 8.64 | 0.467 | 10.699 | OK |
| | | | After Testing | 19.40N MAX. | | | 6.524 | 7.00 | 6.00 | 0.391 | 7.697 | OK |
| | | Unmating Force (N) | Initial | 4.00N MIN. | 5 | 5 | 6.164 | 6.63 | 5.49 | 0.434 | 4.862 | OK |
| | | | After Testing | 4.00N MIN. | | | 5.502 | 5.91 | 5.10 | 0.370 | 4.392 | OK |
| | | Cable Retention Force | | 19.60N MIN. | 5 | 5 | 131.188 | 137.06 | 125.47 | 4.342 | 118.162 | OK |
| B Group High Temperature Life | (PLUG) Contact Retention Force (N) | | Initial | 0.6N MIN. | – | 20 | It does not pull out, even if applies the power of 1.8N to a terminal. | | | | | OK |
| | | | After Testing | 0.6N MIN. | – | 20 | It does not pull out, even if applies the power of 1.8N to a terminal. | | | | | OK |
| | (RECE) Contact Retention Force (N) | | Initial | 0.2N MIN. | – | 20 | 1.429 | 1.81 | 0.96 | 0.232 | 0.733 | OK |
| | | | After Testing | 0.2N MIN. | – | 20 | 1.379 | 1.61 | 1.00 | 0.153 | 0.920 | OK |
| C Group Conn. Lock | | | Initial | The lock does not damage and cancel. | 5 | 5 | No Abnormality | | | | | OK |

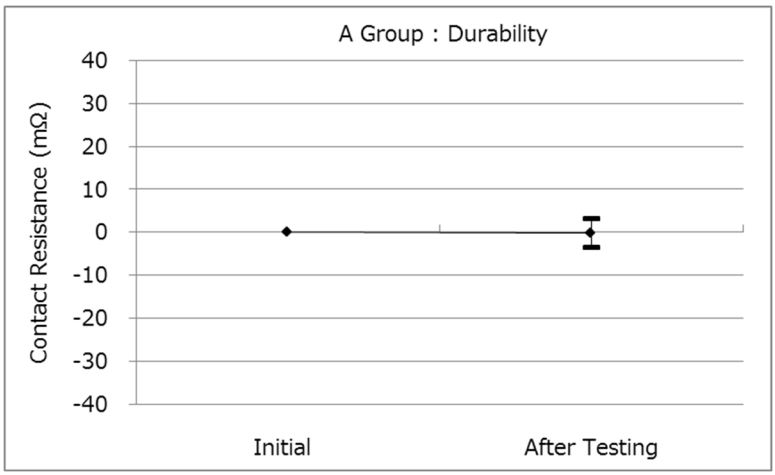
Table.2-2 Test result

| Test Item | Contents of Measurement | | Specifications | Set | n | Data | | | | | Judge |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | AVE. | MAX. | MIN. | s | X±3s | |
| D Group<br>Vibration<br>↓<br>Shock | Contact Resistance (mΩ) | Initial | AWG#36 275mΩMAX. | 5 | 150 | 216.379 | 220.96 | 211.34 | 1.864 | 221.971 | OK |
| | | After Vibration | AWG#36 ΔR=40mΩ MAX. | | | -0.329 | 2.82 | -2.97 | 1.143 | 3.100 | OK |
| | | After Shock | AWG#36 ΔR=40mΩ MAX. | | | -1.043 | 1.44 | -3.90 | 1.034 | 2.059 | OK |
| | GND Resistance (mΩ) | Initial | 50mΩMAX. | 5 | 5 | 9.582 | 10.33 | 9.06 | 0.508 | 11.106 | OK |
| | | After Vibration | ΔR=40mΩ MAX. | | | 0.318 | 0.75 | -0.91 | 0.690 | 2.388 | OK |
| | | After Shock | ΔR=40mΩ MAX. | | | -0.568 | -0.04 | -1.78 | 0.701 | 1.535 | OK |
| | Electrical discontinuity | During Vibration | 1μsec. MAX. | 5 | 5 | No Electrical discontinuity | | | | | OK |
| | | During Shock | | | | No Electrical discontinuity | | | | | OK |
| | Appearance | After Vibration | No abnormality adversely affecting the performance shall occur. | 5 | 5 | No Abnormality | | | | | OK |
| | | After Shock | | | | No Abnormality | | | | | OK |
| E Group<br>Thermal Shock | Contact Resistance (mΩ) | Initial | AWG#36 275mΩMAX. | 5 | 200 | 214.952 | 217.84 | 212.13 | 1.194 | 218.534 | OK |
| | | After Testing | AWG#36 ΔR=40mΩ MAX. | | | 0.760 | 3.45 | -1.81 | 0.946 | 3.598 | OK |
| | GND Resistance (mΩ) | Initial | 50mΩMAX. | 5 | 5 | 9.228 | 9.64 | 9.06 | 0.238 | 9.942 | OK |
| | | After Testing | ΔR=40mΩ MAX. | | | -0.556 | -0.23 | -0.97 | 0.280 | 0.284 | OK |
| F Group<br>High Temperature Life | Contact Resistance (mΩ) | Initial | AWG#36 275mΩMAX | 5 | 200 | 215.985 | 219.32 | 213.59 | 1.115 | 219.330 | OK |
| | | After Testing | AWG#36 ΔR=40mΩ MAX. | | | 1.467 | 5.87 | -2.77 | 1.649 | 6.414 | OK |
| | GND Resistance (mΩ) | Initial | 50mΩMAX. | 5 | 5 | 9.050 | 9.57 | 8.54 | 0.409 | 10.277 | OK |
| | | After Testing | ΔR=40mΩ MAX. | | | -0.448 | -0.26 | -0.64 | 0.153 | 0.011 | OK |
| G Group<br>Humidity (Steady State) | Contact Resistance (mΩ) | Initial | AWG#36 275mΩMAX | 5 | 150 | 214.664 | 219.08 | 211.14 | 1.672 | 219.680 | OK |
| | | After Testing | AWG#36 ΔR=40mΩ MAX. | | | 0.741 | 4.30 | -3.19 | 1.422 | 5.007 | OK |
| | GND Resistance (mΩ) | Initial | 50mΩMAX. | 5 | 5 | 9.840 | 10.40 | 9.36 | 0.434 | 11.142 | OK |
| | | After Testing | ΔR=40mΩ MAX. | | | -0.020 | 0.37 | -0.52 | 0.406 | 1.198 | OK |
| | Insulation Resistance (MΩ) | Initial | 1000MΩMIN. | 5 | 75 | $1.96\times10^{4}$MΩMIN. | | | | | OK |
| | | After Testing | 500MΩMIN. | | | $8.47\times10^{3}$MΩMIN. | | | | | OK |
| | D. W. Voltage | Initial | No abnormality adversely affecting the performance shall occur. | 5 | 75 | No Abnormality | | | | | OK |
| | | After Testing | | | | No Abnormality | | | | | OK |

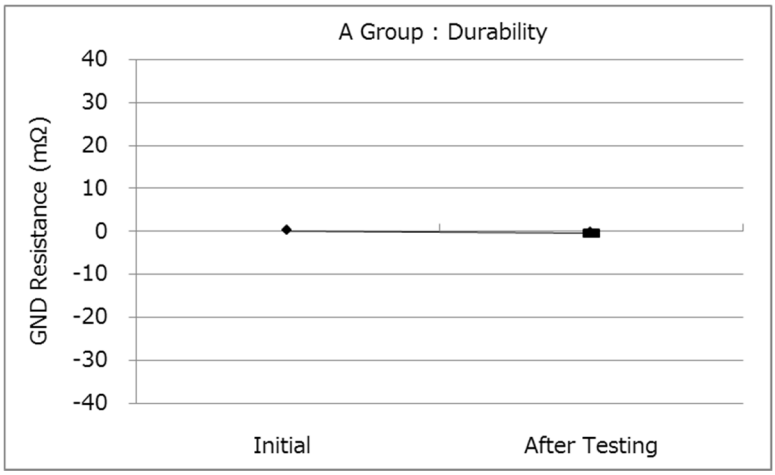
Table.2-3 Test result

| Test Item | Contents of Measurement | | Specifications | Set | n | Data | | | | | Judge |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | AVE. | MAX. | MIN. | s | X±3s | |
| H Group<br>Humidity (Cycling) | Contact Resistance (mΩ) | Initial | AWG#36 275mΩMAX. | 5 | 150 | 215.987 | 220.29 | 211.64 | 1.506 | 220.505 | OK |
| | | After Durability | AWG#36 ΔR=40mΩ MAX. | | | -0.368 | 5.00 | -5.60 | 1.983 | 5.581 | OK |
| | | After Testing | AWG#36 ΔR=40mΩ MAX. | | | -0.493 | 3.51 | -4.15 | 1.356 | 3.575 | OK |
| | GND Resistance (mΩ) | Initial | 50mΩMAX. | 5 | 5 | 9.316 | 9.94 | 9.05 | 0.355 | 10.381 | OK |
| | | After Durability | ΔR=40mΩ MAX. | | | -0.036 | 0.31 | -0.88 | 0.480 | 1.404 | OK |
| | | After Testing | ΔR=40mΩ MAX. | | | 0.120 | 0.31 | -0.35 | 0.272 | 0.936 | OK |
| | Insulation Resistance (MΩ) | Initial | 1000MΩMIN. | 5 | 75 | $2.74\times10^3$MΩMIN. | | | | | OK |
| | | After Testing | 500MΩMIN. | | | $1.09\times10^4$MΩMIN. | | | | | OK |
| | D. W. Voltage | Initial | No abnormality adversely affecting the performance shall occur. | 5 | 75 | No Abnormality | | | | | OK |
| | | After Testing | | | | No Abnormality | | | | | OK |
| J Group<br>Salt Water Spray | Contact Resistance (mΩ) | Initial | AWG#36 275mΩMAX. | 5 | 150 | 214.888 | 218.70 | 211.12 | 1.445 | 219.223 | OK |
| | | After Testing | AWG#36 ΔR=40mΩ MAX. | | | 0.194 | 3.14 | -3.15 | 1.320 | 4.154 | OK |
| | GND Resistance (mΩ) | Initial | 50mΩMAX. | 5 | 5 | 9.506 | 9.87 | 9.20 | 0.285 | 10.361 | OK |
| | | After Testing | ΔR=40mΩ MAX. | | | 0.700 | 1.22 | 0.21 | 0.411 | 1.933 | OK |
| K Group<br>$H_2S$ Gas | Contact Resistance (mΩ) | Initial | AWG#36 275mΩMAX. | 5 | 150 | 214.470 | 218.19 | 211.61 | 1.467 | 218.871 | OK |
| | | After testing | AWG#36 ΔR=40mΩ MAX. | | | -0.021 | 2.34 | -2.31 | 1.019 | 3.036 | OK |
| | GND Resistance (mΩ) | Initial | 50mΩMAX. | 5 | 5 | 9.556 | 9.78 | 9.22 | 0.225 | 10.231 | OK |
| | | After Testing | ΔR=40mΩ MAX. | | | -0.280 | -0.06 | -0.42 | 0.171 | 0.233 | OK |
| L Group<br>Solderability | Appearance | | More than 95% of the dipped surface shall be evenly wet. | 10 | 10 | Wet 95% MIN. | | | | | OK |
| M Group<br>Soldering Heat Resistance | Appearance | | No abnormality adversely affecting the performance shall occur. | 10 | 10 | No Abnormality | | | | | OK |
| N Group<br>Temperature Rising | AWG#40 0.3A/Contact (30P) | | ΔT=30℃ MAX. | 5 | 5 | ΔT=27.2℃MAX. | | | | | OK |

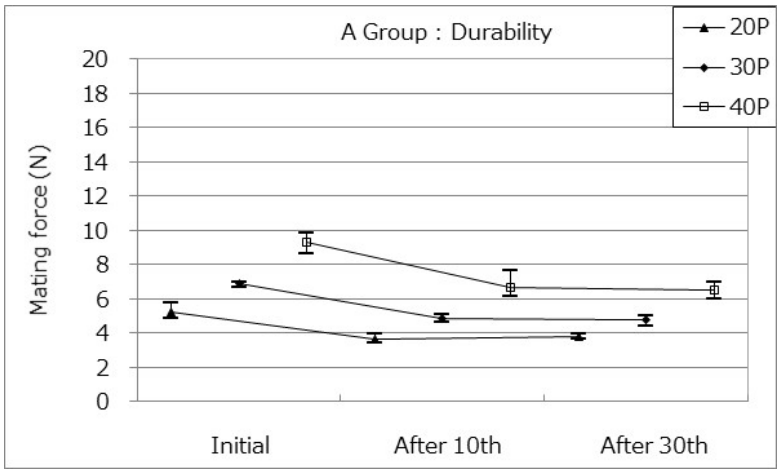
**Graph.1**



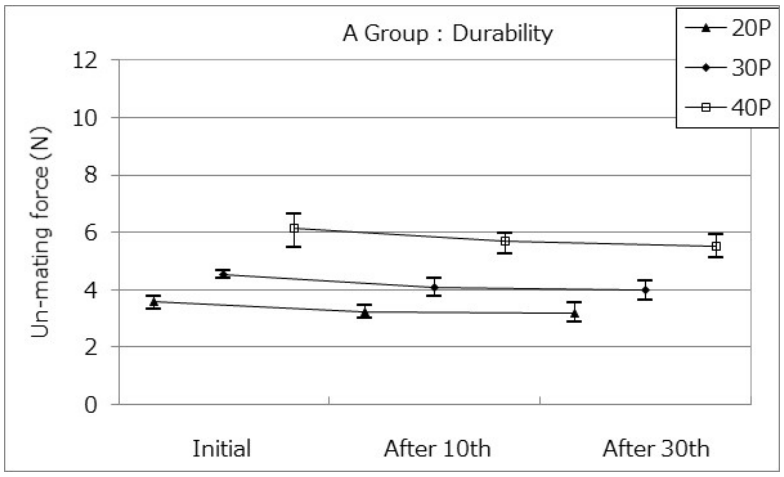

**Graph.2**



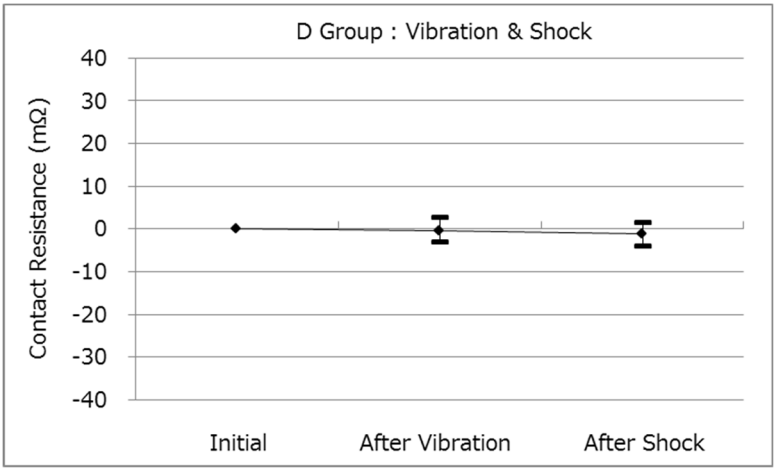

**Graph.3**



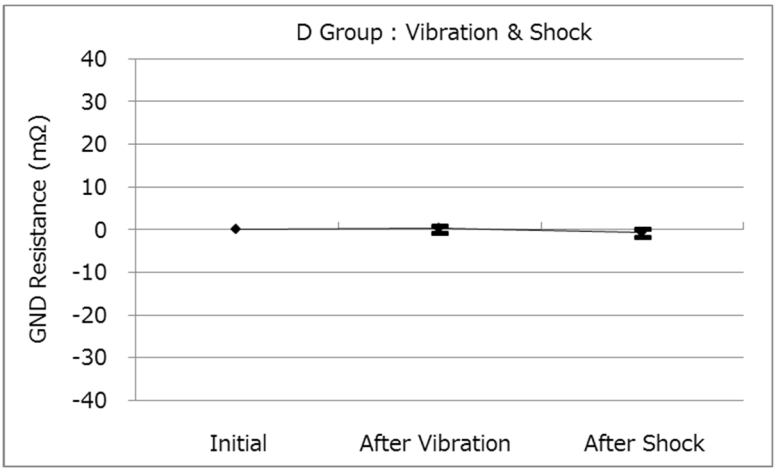
**Graph.4**



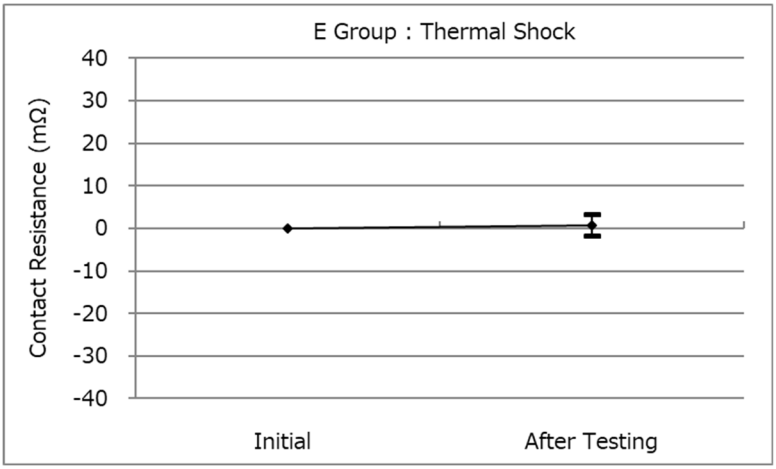

**Graph.5**



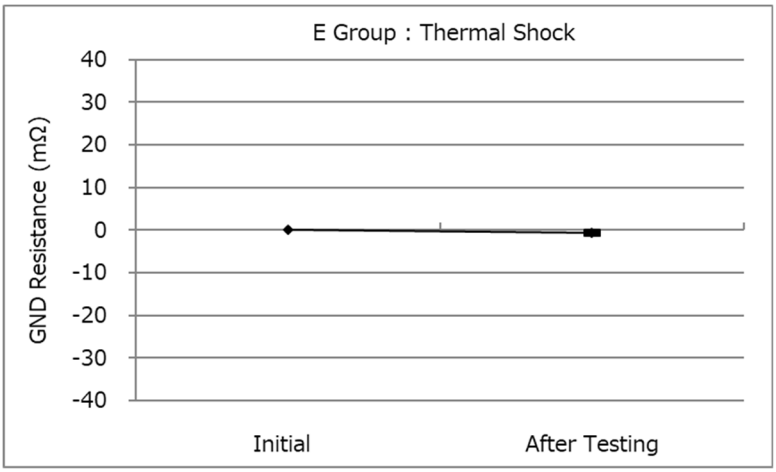

**Graph.6**



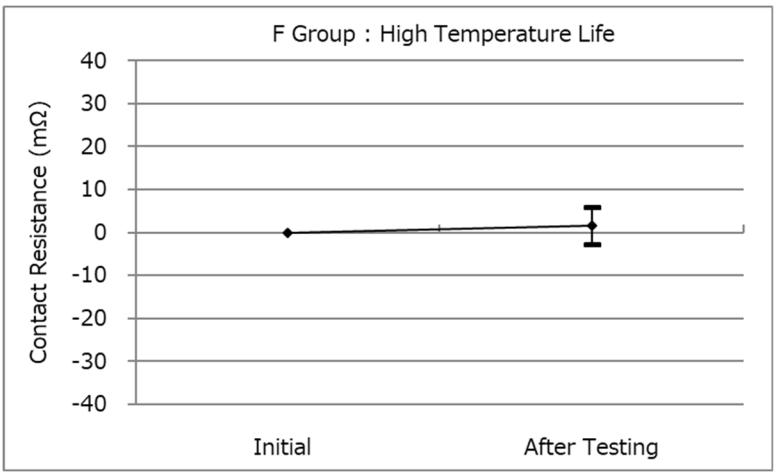
**Graph.7**



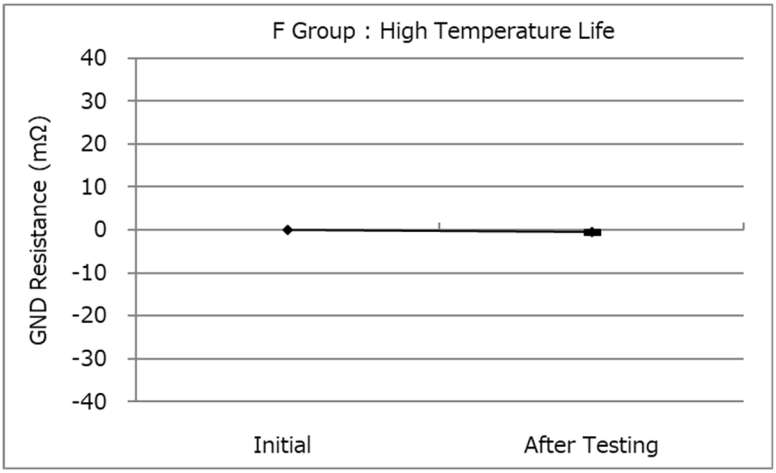

**Graph.8**



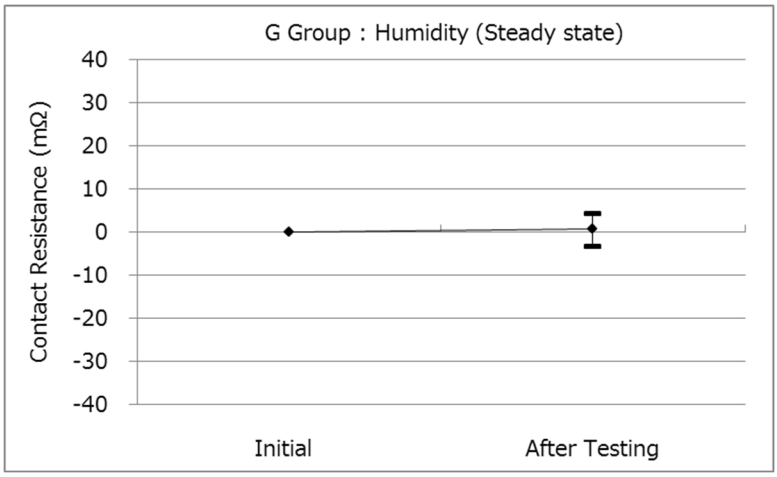

**Graph.9**



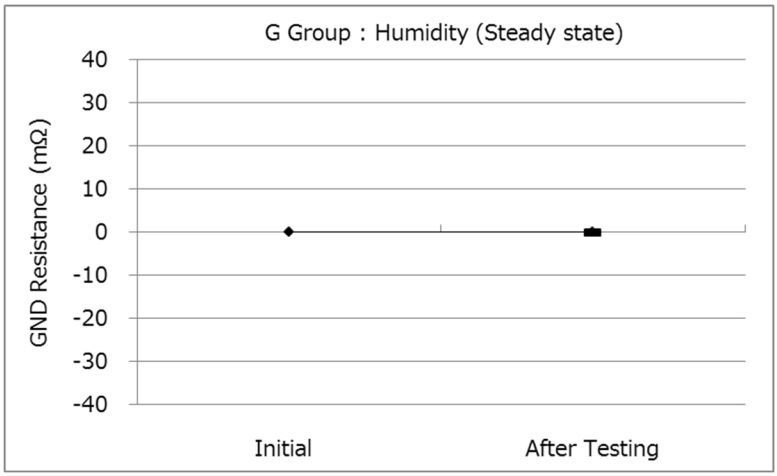
**Graph.10**



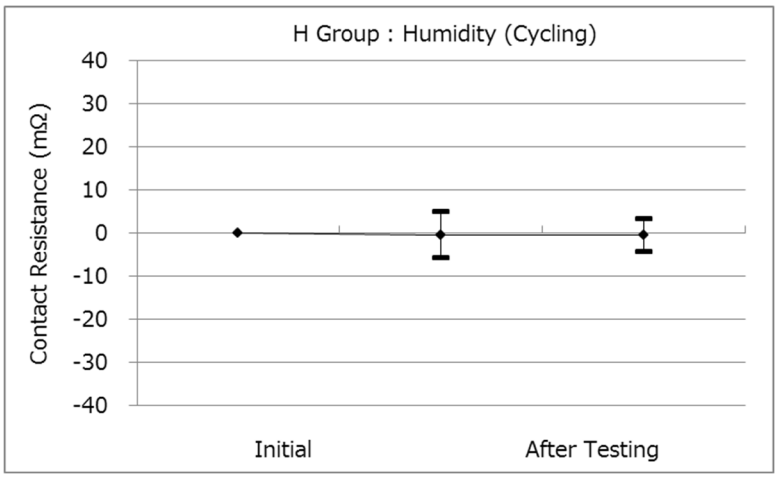

**Graph.11**



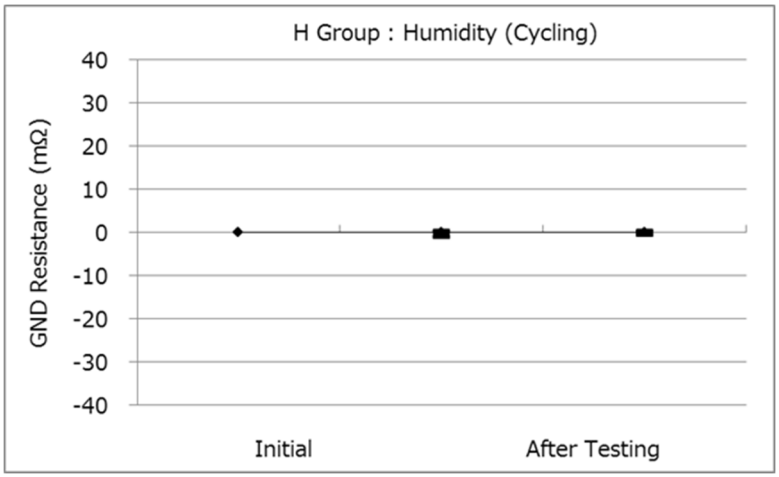

**Graph.12**



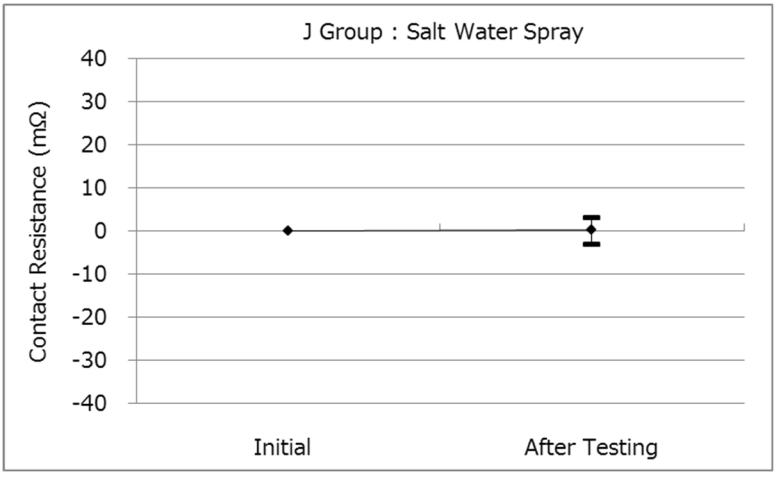
**Graph.13**



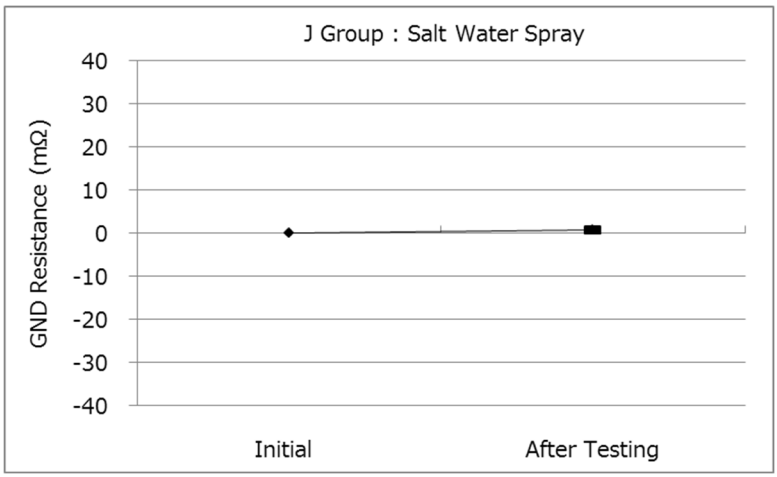

**Graph.14**



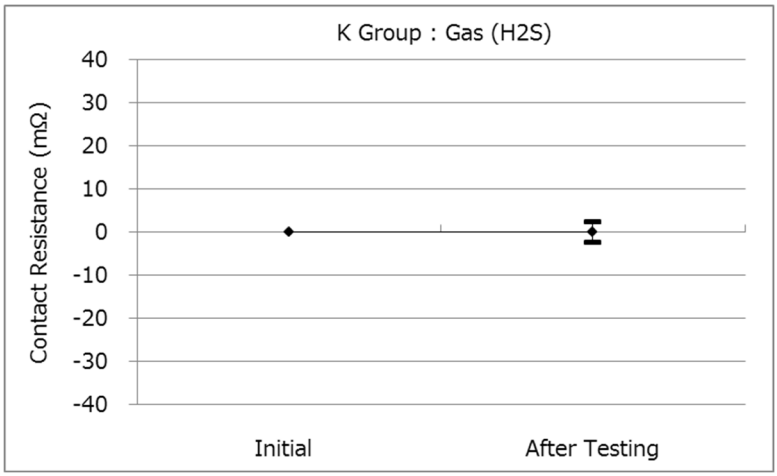

**Graph.15**



**Graph.16**




**Graph.17**




**Graph.18**