

NOVASTACK® 35-HDP

Part No. 20697-0**E-01#, 20698-0**E-01#

Test Report

Product Specification no. PRS-2187

| | | | | | |
|------|--------|-------------------|-------------|------------|-------------|
| 3 | T18145 | December 28, 2018 | R.Shioya | Y.Baba | T.Hirakawa |
| 2 | T16160 | October 7, 2016 | T.Kurachi | | J.Tateishi |
| 1 | T16068 | March 3, 2016 | T.Kurachi | | J.Tateishi |
| 0 | T16053 | April 8, 2016 | T.Kurachi | | J.Tateishi |
| Rev. | ECN | Date | Prepared by | Checked by | Approved by |

Connector name Test Report

1. Purpose

NOVASTACK 35-HDP コネクタの性能を PRS-2187 に基づいて評価する。

To evaluate the performance of NOVASTACK 35-HDPConnector in accordance with PRS-2187.

2. Specimen

(1) NOVASTACK 35-HDP PLUG ASS'Y (P/N: 20697-0**E-01#)

(2) NOVASTACK 35-HDP RECEPTACLE ASS'Y (P/N: 20698-0**E-01#)

3. Test Sequence

全ての評価は表 1 の試験順序に従って行った。

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

4. Result

表 1～4、グラフ 1～30 参照。試験条件の詳細は PRS-2187 参照。n 数は測定データを意味する。

See Table 1 to 4, Graph 1 to 30. For the details of the testing conditions and requirements, see PRS-2187.

The “n” in the tables show the number of measurement points.

5. Conclusion

全ての資料が製品規格（PRS-2187）の必要条件を満足した。

All the specimens met the requirements of PRS-2187.

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Table 1 試験順序と試料数 / Test Sequence and Sample Quantity

| 試験項目 Test Item | グループ / Group | | | | | | | | | | | | |
|---|--------------|------------|-----------|-----------|-----------|-----------|-----------------|-----------|-----------|-----------|------------|------------|-----------|
| | A | B | C | D | E | F | G | H | J | K | L | M | |
| 接触抵抗 Contact Resistance | 2,6 | | 1,3,5 | 1,3 | 1,3 | 1,5 | 1,5,7 | 1,3 | 1,3 | | | | |
| 絶縁抵抗 Insulation Resistance | | | | | | 2,6 | 2,8 | | | | | | |
| 耐電圧 D. W. Voltage | | | | | | 3,7 | 3,9 | | | | | | |
| 温度上昇 Temperature Rising | | | | | | | | | | | | 1 | |
| 挿入力 Mating Force | 1,5 | | | | | | | | | | | | |
| 抜き力 Unmating Force | 3,7 | | | | | | | | | | | | |
| 耐久性 Durability | 4 | | | | | | 4 (10cycles) | | | | | | |
| 端子保持力 Contact Retention Force | | 1,3 | | | | | | | | | | | |
| 振動 Vibration | | | 2 | | | | | | | | | | |
| 衝撃 Shock | | | 4 | | | | | | | | | | |
| 熱衝撃 Thermal Shock | | | | 2 | | | | | | | | | |
| 高温寿命 High Temperature Life | | 2 | | | 2 | | | | | | | | |
| 湿度(定常状態) Humidity (Steady State) | | | | | | 4 | | | | | | | |
| 湿度 (サイクリング) Humidity (Cycling) | | | | | | | 6 | | | | | | |
| 塩水噴霧 Salt Water Spray | | | | | | | | 2 | | | | | |
| ガス (H ₂ S) Gas (H ₂ S) | | | | | | | | | 2 | | | | |
| 半田付け性 Solderability | | | | | | | | | | 1 | | | |
| 半田耐熱性 Soldering Heat Resistance | | | | | | | | | | | 1 | | |
| 試料数 Sample QTY. | 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. |

※グループ表中の番号は、試験順序を示す。 / Numbers indicate sequence in which tests are performed.

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Table 2-1. 試験結果/Test result

| Group | Contents of measurement | | Spec. | | Unit | Q'ty | n | Data | | | | | Judge. | |
|------------|--------------------------|-----------------|-----------|------|------|----------------|--------|------------------|-------|-------|-------|--------|--------|----|
| | | | | | | | | AVE. | MAX. | MIN. | S | X±3s | | |
| A | Durability | | | | | | | | | | | | | |
| | Contact resistance | | | | | | | | | | | | | |
| | Signal contact | Initial | 40 | MAX. | mΩ | 5 | 210 | 15.223 | 17.22 | 14.15 | 0.690 | 17.293 | OK | |
| | | After 30 cycles | ΔR 40 | MAX. | | | | 0.324 | 3.78 | -2.91 | 1.568 | 5.028 | OK | |
| | Power contact | Initial | 20 | MAX. | | | | 20 | 2.985 | 3.78 | 2.47 | 0.403 | 4.194 | OK |
| | | After 30 cycles | ΔR 20 | MAX. | | | | | 0.115 | 0.61 | -0.57 | 0.327 | 1.096 | OK |
| | GND | Initial | 20 | MAX. | | | | 10 | 9.095 | 10.17 | 8.50 | 0.468 | 10.499 | OK |
| | | After 30 cycles | ΔR 20 | MAX. | | | | | 1.162 | 1.78 | 0.38 | 0.434 | 2.464 | OK |
| | Mating force | | | | | | | | | | | | | |
| | 42P | Initial | 46.0 | MAX. | N | 5 | - | 32.592 | 33.71 | 31.51 | - | - | OK | |
| | | After 30 cycles | | | | | | 14.194 | 14.66 | 13.42 | - | - | OK | |
| | 56P | Initial | 60.0 | MAX. | | | - | 39.758 | 42.40 | 38.37 | - | - | OK | |
| | | After 30 cycles | | | | | | 19.596 | 21.23 | 18.08 | - | - | OK | |
| | 62P | Initial | 66.0 | MAX. | | | - | 45.920 | 47.20 | 44.10 | - | - | OK | |
| | | After 30 cycles | | | | | | 21.840 | 23.00 | 21.30 | - | - | OK | |
| | Unmating force | | | | | | | | | | | | | |
| | 42P | Initial | 4.6 | MIN. | N | 5 | - | 15.988 | 17.88 | 15.13 | - | - | OK | |
| | | After 30 cycles | | | | | | 9.942 | 10.40 | 9.30 | - | - | OK | |
| | 56P | Initial | 6.0 | MIN. | | | - | 20.800 | 21.63 | 20.45 | - | - | OK | |
| | | After 30 cycles | | | | | | 13.340 | 13.93 | 12.94 | - | - | OK | |
| 62P | Initial | 6.6 | MIN. | - | | | 18.940 | 19.60 | 18.00 | - | - | OK | | |
| | After 30 cycles | | | | | | 18.060 | 19.30 | 16.50 | - | - | OK | | |
| B | Contact retention force | | | | | | | | | | | | | |
| | Plug | | | | | | | | | | | | | |
| | Signal contact | Initial | 0.6 | MIN. | N | - | 20 | 2.52 MIN. | | | | | OK | |
| | | After test | | | | | | 2.07 MIN. | | | | | OK | |
| | Power contact | Initial | 3.80 MIN. | | | | | OK | | | | | | |
| | | After test | 3.92 MIN. | | | | | OK | | | | | | |
| | Receptacle | | | | | | | | | | | | | |
| | Signal contact | Initial | 0.1 | MIN. | N | - | 20 | 0.42 MIN. | | | | | OK | |
| | | After test | | | | | | 0.34 MIN. | | | | | OK | |
| | Power contact | Initial | 0.53 MIN. | | | | | OK | | | | | | |
| After test | | 0.48 MIN. | | | | | OK | | | | | | | |
| C | Vibration → Shock | | | | | | | | | | | | | |
| | Contact resistance | | | | | | | | | | | | | |
| | Signal contact | Initial | 40 | MAX. | mΩ | 5 | 210 | 15.200 | 17.04 | 13.96 | 0.685 | 17.255 | OK | |
| | | After vibration | ΔR 40 | MAX. | | | | -0.500 | 0.32 | -1.31 | 0.474 | 0.922 | OK | |
| | | After shock | | | | | | -0.505 | 0.44 | -1.39 | 0.393 | 0.674 | OK | |
| | Power contact | Initial | 20 | MAX. | | | 20 | 2.783 | 3.31 | 2.18 | 0.362 | 3.869 | OK | |
| | | After vibration | ΔR 20 | MAX. | | | | 0.166 | 0.72 | -0.20 | 0.268 | 0.970 | OK | |
| | | After shock | | | | | | 0.324 | 0.87 | -0.29 | 0.363 | 1.413 | OK | |
| | GND | Initial | 20 | MAX. | 10 | 8.145 | 9.28 | 7.38 | 0.585 | 9.900 | OK | | | |
| | | After vibration | ΔR 20 | MAX. | | 0.149 | 0.55 | -0.20 | 0.281 | 0.992 | OK | | | |
| | | After shock | | | | 0.163 | 0.77 | -0.27 | 0.288 | 1.027 | OK | | | |
| | Electrical discontinuity | | | | | | | | | | | | | |
| | | During test | 1 | MAX. | μs | 5 | - | No discontinuity | | | | | OK | |
| Appearance | | | | | | | | | | | | | | |
| | After test | No abnormality | - | 5 | - | No abnormality | | | | | OK | | | |

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Table 2-2. 試験結果/Test result

| Group | Contents of measurement | | Spec. | | Unit | Q'ty | n | Data | | | | | Judge. | |
|---------------------------------|-------------------------|----------------|----------------|------|------|----------------|----------------|--------|-----------------------------|-----------------------------|-------|--------|--------|----|
| | | | | | | | | AVE. | MAX. | MIN. | S | X±3s | | |
| D | Thermal shock | | | | | | | | | | | | | |
| | Contact resistance | | | | | | | | | | | | | |
| | Signal contact | Initial | 40 | MAX. | mΩ | 5 | 210 | 15.962 | 18.86 | 13.46 | 1.198 | 19.556 | OK | |
| | | After test | ΔR | 40 | | | | MAX. | 0.769 | 4.46 | -2.70 | 1.376 | 4.897 | OK |
| | Power contact | Initial | 20 | MAX. | | | 20 | 2.680 | 3.48 | 1.67 | 0.537 | 4.291 | OK | |
| | | After test | ΔR | 20 | | | | MAX. | 0.420 | 1.09 | -0.15 | 0.308 | 1.344 | OK |
| | GND | Initial | 20 | MAX. | | | 10 | 8.865 | 9.38 | 8.45 | 0.356 | 9.933 | OK | |
| | | After test | ΔR | 20 | | | | MAX. | -0.067 | 0.61 | -0.84 | 0.413 | 1.172 | OK |
| | Appearance | | | | | | | | | | | | | |
| | | After test | No abnormality | - | 5 | - | No abnormality | | | | | OK | | |
| E | High temperature life | | | | | | | | | | | | | |
| | Contact resistance | | | | | | | | | | | | | |
| | Signal contact | Initial | 40 | MAX. | mΩ | 5 | 210 | 15.949 | 18.73 | 13.20 | 1.215 | 19.594 | OK | |
| | | After test | ΔR | 40 | | | | MAX. | 0.529 | 3.44 | -2.26 | 1.110 | 3.859 | OK |
| | Power contact | Initial | 20 | MAX. | | | 20 | 2.718 | 3.33 | 2.21 | 0.363 | 3.807 | OK | |
| | | After test | ΔR | 20 | | | | MAX. | -0.095 | 0.76 | -0.80 | 0.437 | 1.216 | OK |
| | GND | Initial | 20 | MAX. | | | 10 | 8.208 | 8.67 | 7.46 | 0.441 | 9.531 | OK | |
| | | After test | ΔR | 20 | | | | MAX. | -0.098 | 0.75 | -0.75 | 0.465 | 1.297 | OK |
| | Appearance | | | | | | | | | | | | | |
| | | After test | No abnormality | - | 5 | - | No abnormality | | | | | OK | | |
| F | Humidity(steady state) | | | | | | | | | | | | | |
| | Contact resistance | | | | | | | | | | | | | |
| | Signal contact | Initial | 40 | MAX. | mΩ | 5 | 210 | 16.158 | 18.74 | 13.94 | 1.143 | 19.587 | OK | |
| | | After test | ΔR | 40 | | | | MAX. | 0.865 | 3.37 | -1.63 | 1.103 | 4.174 | OK |
| | Power contact | Initial | 20 | MAX. | | | 20 | 2.786 | 3.62 | 2.18 | 0.393 | 3.965 | OK | |
| | | After test | ΔR | 20 | | | | MAX. | 0.190 | 1.13 | -0.84 | 0.582 | 1.936 | OK |
| | GND | Initial | 20 | MAX. | | | 10 | 8.295 | 8.78 | 7.56 | 0.378 | 9.429 | OK | |
| | | After test | ΔR | 20 | | | | MAX. | -0.186 | 0.30 | -0.91 | 0.420 | 1.074 | OK |
| | Insulation resistance | | Initial | | 1000 | MIN. | MΩ | 5 | - | 1.28 x 10 ⁵ Min. | | | OK | |
| | | | After test | | 500 | MIN. | | | | 1.04 x 10 ⁵ Min. | | | OK | |
| Dielectric Withstanding Voltage | | | | | | | | | | | | | | |
| | After test | No abnormality | - | 5 | - | No abnormality | | | | | OK | | | |
| Appearance | | | | | | | | | | | | | | |
| | After test | No abnormality | - | 5 | - | No abnormality | | | | | OK | | | |
| G | Humidity(cycling) | | | | | | | | | | | | | |
| | Contact resistance | | | | | | | | | | | | | |
| | Signal contact | Initial | 40 | MAX. | mΩ | 5 | 210 | 15.793 | 17.74 | 13.74 | 0.842 | 18.319 | OK | |
| | | After 10cycle | ΔR | 40 | | | | MAX. | -0.719 | 1.60 | -2.52 | 0.786 | 1.639 | OK |
| | | After test | | | | | | | 0.493 | 2.51 | -1.63 | 0.881 | 3.136 | OK |
| | Power contact | Initial | 20 | MAX. | | | 20 | 2.982 | 3.70 | 2.33 | 0.426 | 4.260 | OK | |
| | | After 10cycle | ΔR | 20 | | | | MAX. | -0.041 | 1.29 | -1.08 | 0.643 | 1.888 | OK |
| | | After test | | | | | | | 0.114 | 1.36 | -1.18 | 0.626 | 1.992 | OK |
| | GND | Initial | 20 | MAX. | | | 10 | 8.164 | 8.86 | 7.40 | 0.399 | 9.361 | OK | |
| | | After 10cycle | ΔR | 20 | | | | MAX. | -0.070 | 1.04 | -1.31 | 0.709 | 2.057 | OK |
| After test | | 0.134 | | | | | | | 1.33 | -0.46 | 0.559 | 1.811 | OK | |
| Insulation resistance | | Initial | | 1000 | MIN. | MΩ | 5 | - | 1.15 x 10 ⁵ Min. | | | OK | | |
| | | After test | | 500 | MIN. | | | | 1.04 x 10 ⁵ Min. | | | OK | | |
| Dielectric Withstanding Voltage | | | | | | | | | | | | | | |
| | After test | No abnormality | - | 5 | - | No abnormality | | | | | OK | | | |
| Appearance | | | | | | | | | | | | | | |
| | After test | No abnormality | - | 5 | - | No abnormality | | | | | OK | | | |

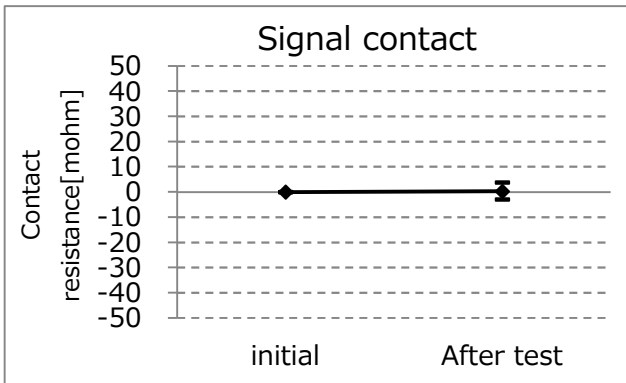
Connector name Test Report

Table 2-3. 試験結果/Test result

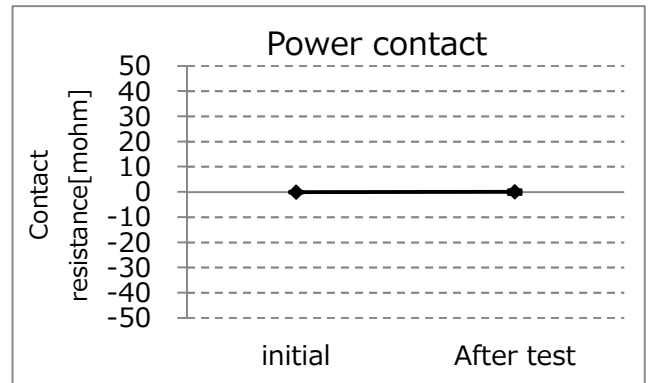
| Group | Contents of measurement | Spec. | Unit | Q'ty | n | Data | | | | | Judge. | | |
|--------------------------------|-------------------------------------|----------------|------------|----------|----|----------------|---------|----------------|--------|-------|--------|--------|-------|
| | | | | | | AVE. | MAX. | MIN. | S | X±3s | | | |
| H | Salt water spray | | | | | | | | | | | | |
| | Contact resistance | | | | | | | | | | | | |
| | Signal contact | Initial | 40 | MAX. | mΩ | 5 | 210 | 15.093 | 17.07 | 13.23 | 0.890 | 17.763 | OK |
| | | After test | ΔR | 40 | | | | MAX. | 0.201 | 3.68 | -3.49 | 1.670 | 5.211 |
| | Power contact | Initial | 20 | MAX. | | | 20 | 2.952 | 3.36 | 2.46 | 0.255 | 3.717 | OK |
| | | After test | ΔR | 20 | | | | MAX. | -0.037 | 0.98 | -0.53 | 0.382 | 1.109 |
| | GND | Initial | 20 | MAX. | | | 10 | 8.050 | 8.70 | 7.55 | 0.404 | 9.262 | OK |
| | | After test | ΔR | 20 | | | | MAX. | 0.036 | 0.77 | -0.61 | 0.444 | 1.368 |
| Appearance | | | | | | | | | | | | | |
| | After test | No abnormality | - | 5 | | | - | No abnormality | | | | | OK |
| J | Gas | | | | | | | | | | | | |
| | Contact resistance | | | | | | | | | | | | |
| | Signal contact | Initial | 40 | MAX. | mΩ | 5 | 210 | 15.721 | 17.80 | 13.61 | 0.920 | 18.481 | OK |
| | | After test | ΔR | 40 | | | | MAX. | 0.599 | 3.41 | -2.34 | 1.115 | 3.944 |
| | Power contact | Initial | 20 | MAX. | | | 20 | 2.961 | 3.84 | 2.24 | 0.345 | 3.996 | OK |
| | | After test | ΔR | 20 | | | | MAX. | -0.124 | 0.92 | -1.06 | 0.550 | 1.526 |
| | GND | Initial | 20 | MAX. | | | 10 | 8.001 | 8.52 | 7.50 | 0.335 | 9.006 | OK |
| | | After test | ΔR | 20 | | | | MAX. | 0.303 | 0.96 | -0.28 | 0.418 | 1.557 |
| Appearance | | | | | | | | | | | | | |
| | After test | No abnormality | - | 5 | | | - | No abnormality | | | | | OK |
| K | Solder ability | | | | | | | | | | | | |
| | Solder wetting area | | | | | | | | | | | | |
| | After test | 95 | MIN. | % | 10 | - | 95 MIN. | | | | | OK | |
| L | Resistance to reflow soldering heat | | | | | | | | | | | | |
| | Appearance | | | | | | | | | | | | |
| | After test | No abnormality | - | 10 | - | No abnormality | | | | | OK | | |
| M | Temperature rising | | | | | | | | | | | | |
| | 42P (Signal:0.29A,Power:2.20A) | | | | ℃ | 5 | - | 8.5 Max. | | | | | OK |
| | 56P (Signal:0.22A,Power:2.20A) | | ΔT 30 MAX. | | | | | 6.9 Max. | | | | | OK |
| 62P (Signal:0.19A,Power:2.20A) | | | | 5.8 Max. | | | | | OK | | | | |

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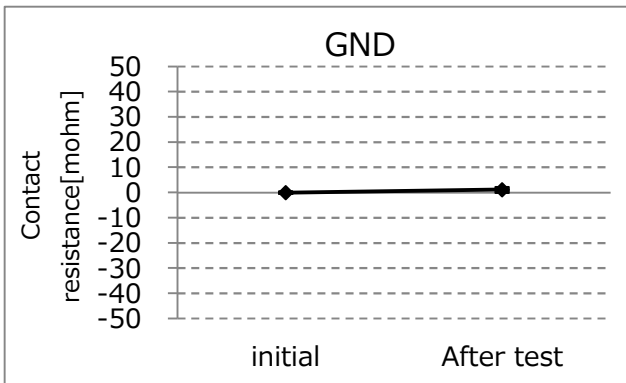
C Group / Durability



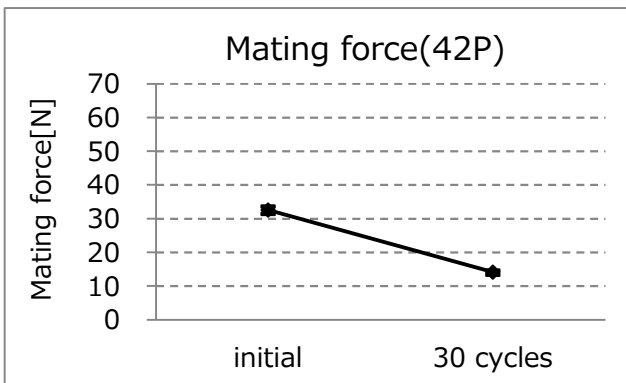
Graph-1. A change of signal contact resistance



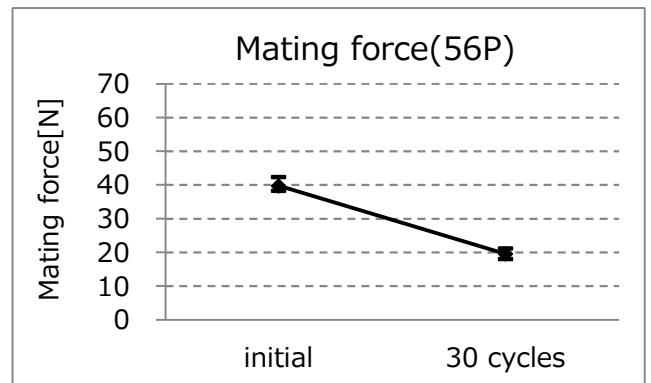
Graph-2. A change of power contact resistance



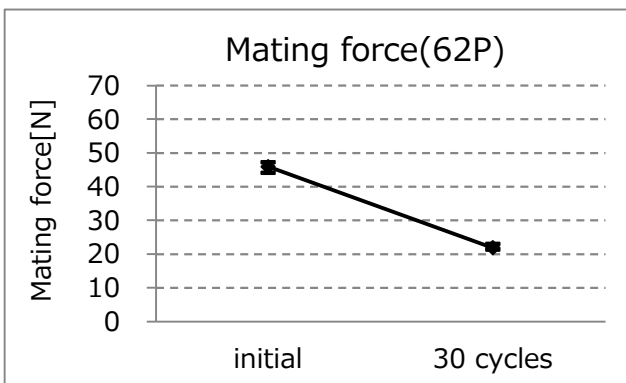
Graph-3. A change of GND contact resistance



Graph-4. A change of mating force

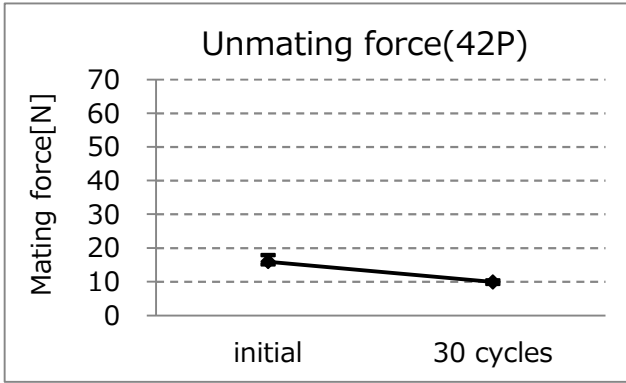


Graph-5. A change of mating force

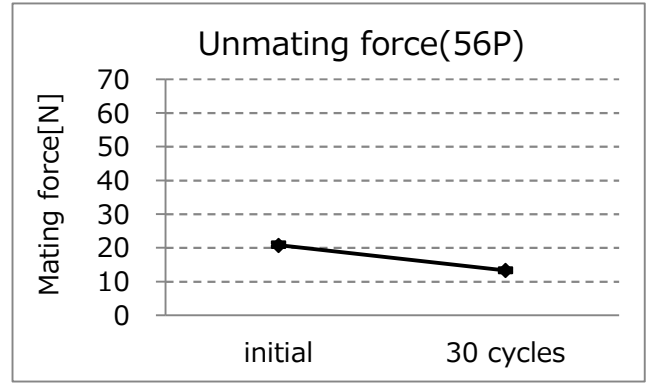


Graph-6. A change of mating force

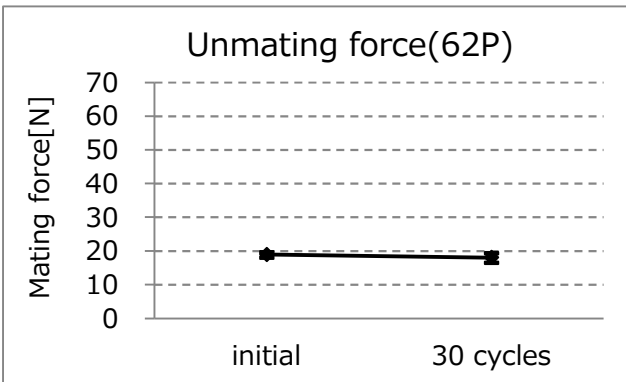
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Graph-7. A change of unmating force

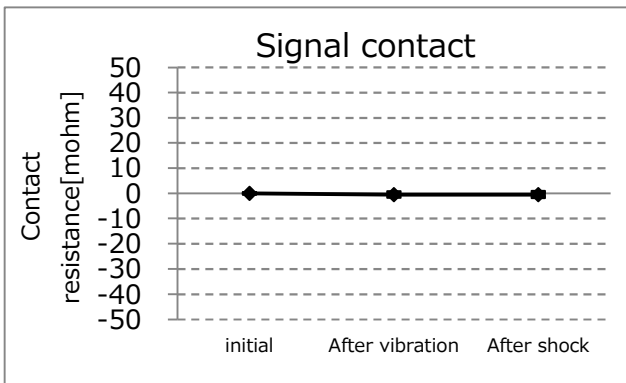


Graph-8. A change of unmating force

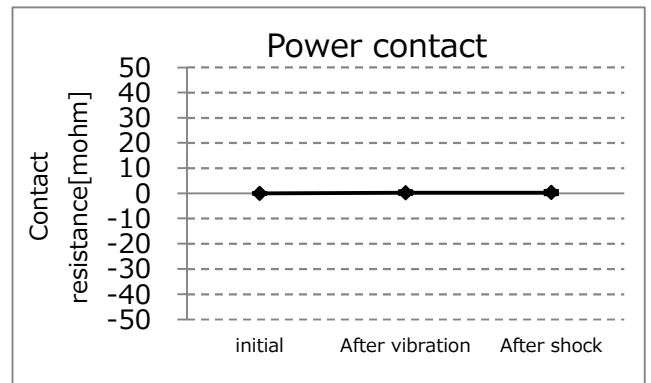


Graph-9. A change of unmating force

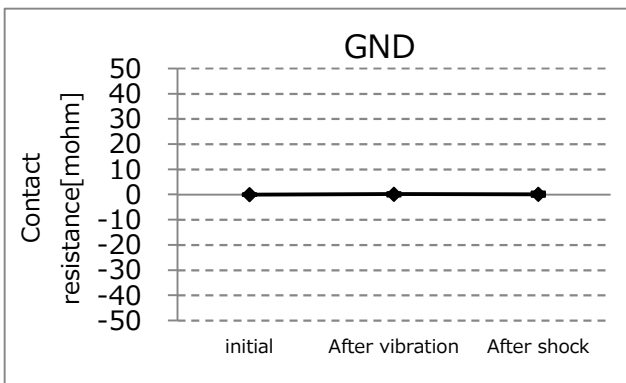
C Group / Vibration → Shock



Graph-10. A change of signal contact resistance



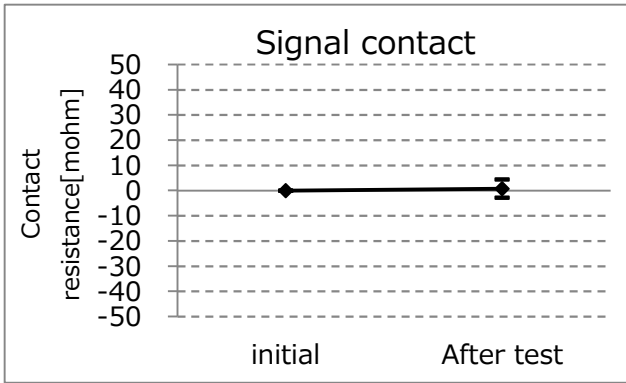
Graph-11. A change of power contact resistance



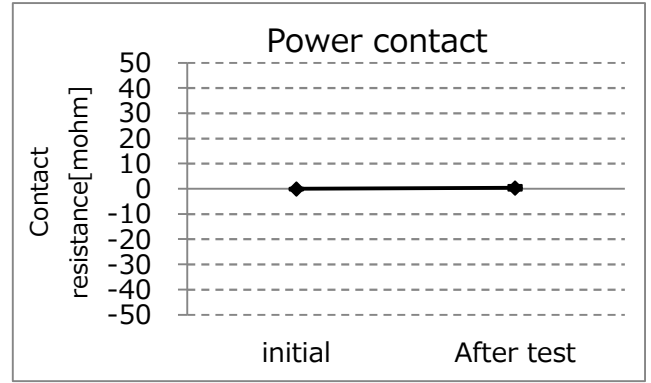
Graph-12. A change of signal contact resistance

Connector name Test Report

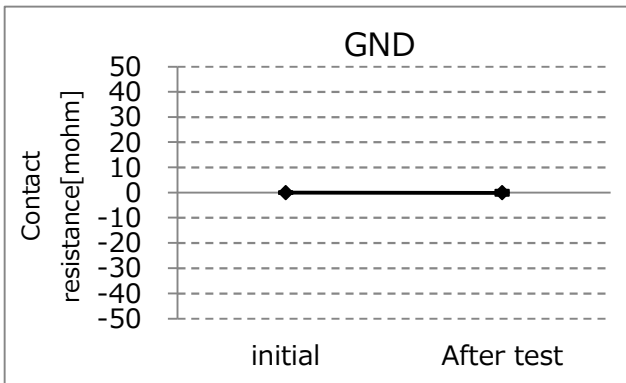
D Group / Thermal Shock



Graph-13. A change of signal contact resistance

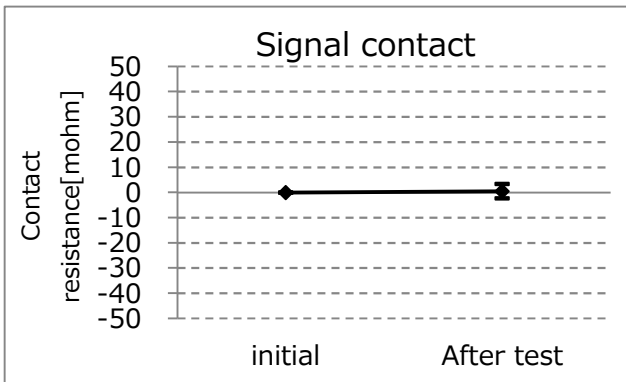


Graph-14. A change of power contact resistance

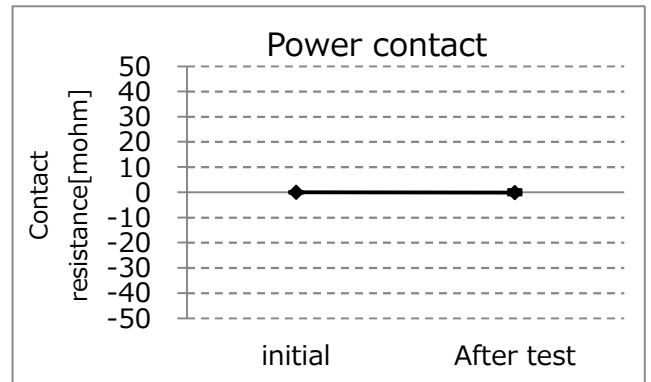


Graph-15. A change of signal contact resistance

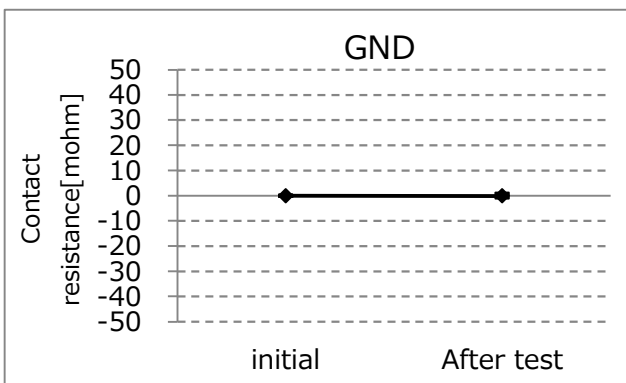
E Group / High Temperature Life



Graph-16. A change of signal contact resistance



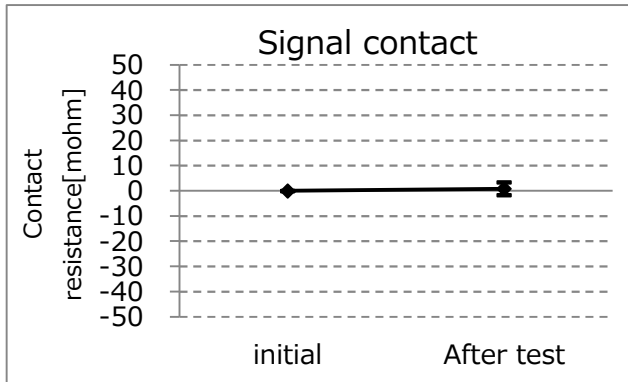
Graph-17. A change of power contact resistance



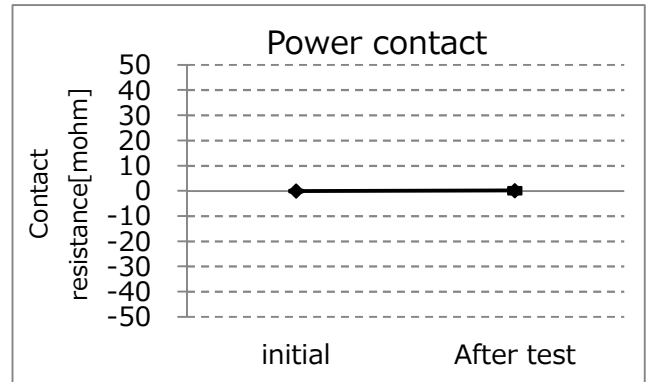
Graph-18. A change of signal contact resistance

Connector name Test Report

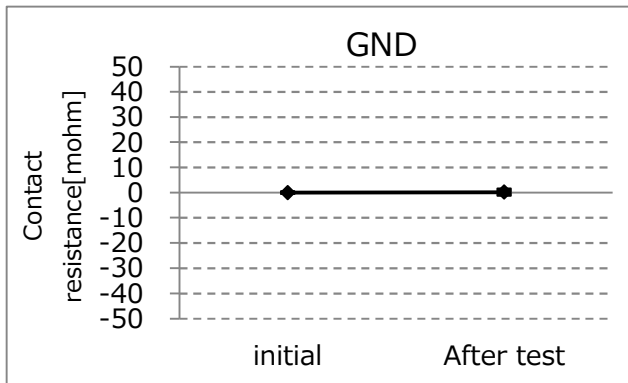
F Group / Humidity (Steady State)



Graph-19. A change of signal contact resistance

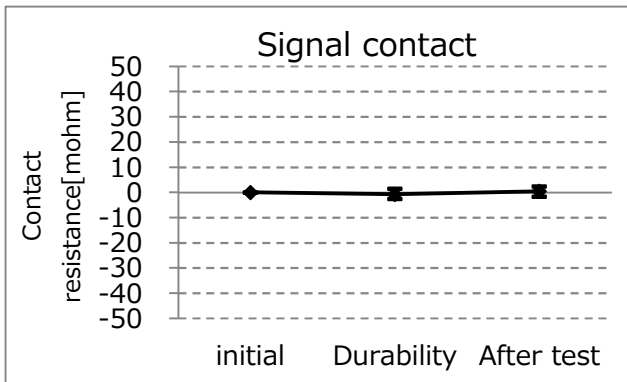


Graph-20. A change of power contact resistance

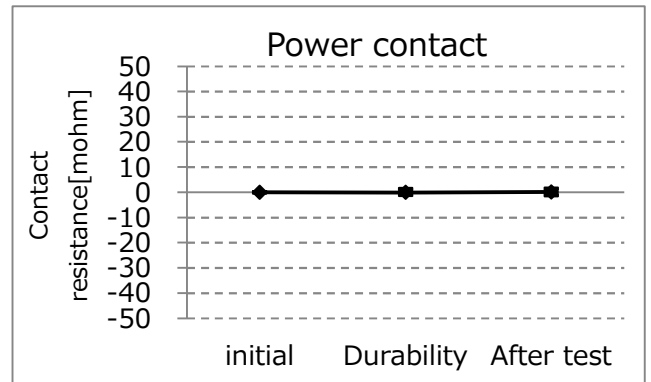


Graph-21. A change of signal contact resistance

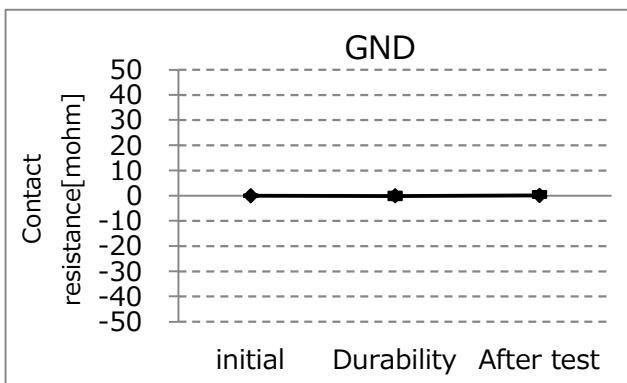
G Group / Humidity (Cycling)



Graph-22. A change of signal contact resistance



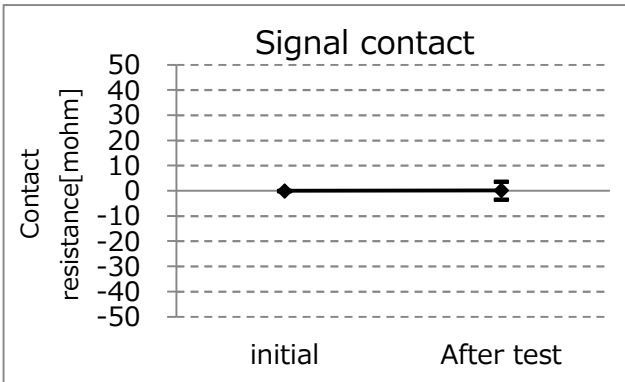
Graph-23. A change of power contact resistance



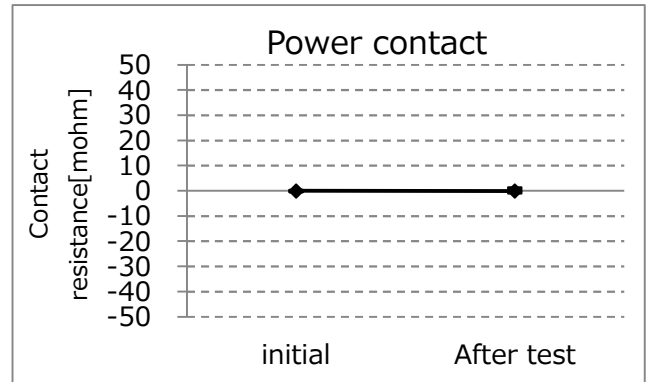
Graph-24. A change of signal contact resistance

Connector name Test Report

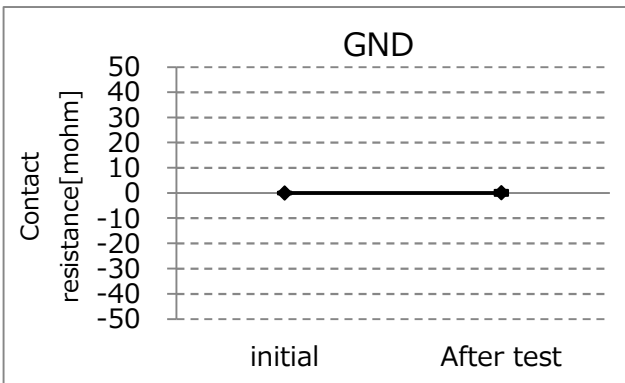
H Group / Salt Water Spray



Graph-25. A change of signal contact resistance

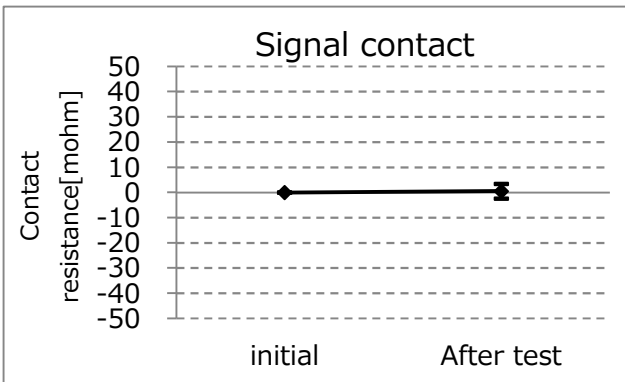


Graph-26. A change of power contact resistance

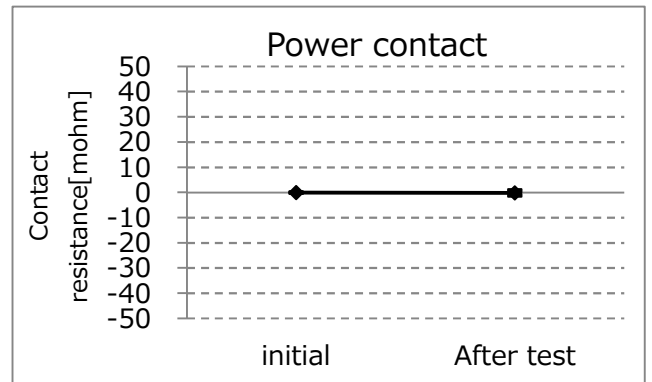


Graph-27. A change of signal contact resistance

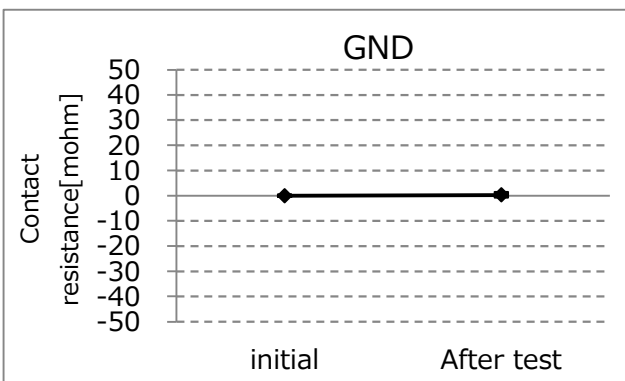
J Group / Gas



Graph-28. A change of signal contact resistance



Graph-29. A change of power contact resistance



Graph-30. A change of signal contact resistance