

MHF[®] I Connector

Ground contact gold plating
(Anti-static reel version)

Test Report

Product Specification no. PRS-1676

| | | | | | |
|------|--------|-------------------|-------------|------------|--------------|
| 13 | T20094 | November 11, 2020 | S.Taguchi | - | M. Takemoto |
| 12 | T20057 | August 6, 2020 | K. Ikeshita | J. Tonai | M. Takemoto |
| 11 | T19068 | June 20, 2019 | K. Ikeshita | J. Tonai | Y. Hashimoto |
| 10 | T17140 | August 31, 2017 | M. Abe | - | T. Matsumoto |
| Rev. | ECN | Date | Prepared by | Checked by | Approved by |

1. Purpose

To evaluate the performance of MHF I Connector in accordance with PRS-1676

2. Specimen

(1) MHF I PLUG (Part No. 20278-112R-**)

1-1. Part No.20278-112R-08 (20278-102R-08)

Cable: AWG#36 coaxial cable (jacket diameter 0.81mm)

1-2. Part No.20278-112R-13 (20278-102R-13)

Cable: AWG#32 coaxial cable (jacket diameter 1.13mm)

1-3. Part No.20278-112R-32 (20278-102R-32)

Cable: AWG#32 coaxial cable (jacket diameter 1.32mm)

1-4. Part No.20278-112R-18 (20278-102R-18)

Cable: AWG#30 coaxial cable (jacket diameter 1.80mm)

* Part No.20278-112R-**, 20278-102R-** are different in the wire connection method Only,
so we tested part No. 20278-112R-** as representative.

(2) MHF I RECEPTACLE (Part No. 20279-001E-01(Anti-static reel version))

* Part No.20279-001E-01、20279-001E-03、20279-001E-05 are different in the packing style only,
so we tested part No. 20279-001E-01 as representative.

3. Test Sequence

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

4. Result

See Table 2 and sheet from 12 to 22. For the details of the testing conditions and requirements, see PRS-1676.

The "n" in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-1676.

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 sequence in which tests are performed.

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. | | | | | | | | | |
| | 20278-112R-08 | - | 10 | - | No abnormality | | | | Pass | |
| | 20278-112R-13 | - | 10 | - | No abnormality | | | | Pass | |
| | 20278-112R-32 | - | 10 | - | No abnormality | | | | Pass | |
| | 20278-112R-18 | - | 10 | - | No abnormality | | | | Pass | |
| B | VSWR | | | | | | | | | |
| | Plug 20278-112R-08 | | | | | | | | | |
| | | 0.1~3.0GHz | 1.3 MAX. | 5 | - | 1.151 | 1.17 | 1.14 | 0.010 | Pass |
| | | 3.0~6.0GHz | 1.5 MAX. | 5 | - | 1.155 | 1.16 | 1.15 | 0.005 | Pass |
| | | 6.0~9.0GHz | 1.9 MAX. | 5 | - | 1.222 | 1.26 | 1.19 | 0.023 | Pass |
| | Plug 20278-112R-13 | | | | | | | | | |
| | | 0.1~3.0GHz | 1.3 MAX. | 5 | - | 1.037 | 1.04 | 1.03 | 0.004 | Pass |
| | | 3.0~6.0GHz | 1.5 MAX. | 5 | - | 1.121 | 1.14 | 1.11 | 0.009 | Pass |
| | | 6.0~9.0GHz | 1.9 MAX. | 5 | - | 1.260 | 1.31 | 1.21 | 0.028 | Pass |
| | Plug 20278-112R-32 | | | | | | | | | |
| | | 0.1~3.0GHz | 1.3 MAX. | 5 | - | 1.082 | 1.11 | 1.06 | 0.012 | Pass |
| | | 3.0~6.0GHz | 1.5 MAX. | 5 | - | 1.178 | 1.21 | 1.15 | 0.019 | Pass |
| | | 6.0~9.0GHz | 1.9 MAX. | 5 | - | 1.294 | 1.38 | 1.25 | 0.038 | Pass |
| | Plug 20278-112R-18 | | | | | | | | | |
| | | 0.1~3.0GHz | 1.3 MAX. | 5 | - | 1.125 | 1.14 | 1.11 | 0.011 | Pass |
| | | 3.0~6.0GHz | 1.5 MAX. | 5 | - | 1.207 | 1.23 | 1.19 | 0.015 | Pass |
| | | 6.0~9.0GHz | 1.9 MAX. | 5 | - | 1.324 | 1.36 | 1.28 | 0.030 | Pass |
| | Receptacle 20279-001E-01 | | | | | | | | | |
| | | 0.1~3.0GHz | 1.3 MAX. | 5 | - | 1.085 | 1.09 | 1.08 | 0.006 | Pass |
| | 3.0~6.0GHz | 1.4 MAX. | 5 | - | 1.233 | 1.27 | 1.18 | 0.033 | Pass | |
| | 6.0~9.0GHz | 1.8 MAX. | 5 | - | 1.515 | 1.60 | 1.41 | 0.068 | Pass | |
| C | Unmating force | | | | | | | | | |
| | Total force (20278-112R-**) | | | | | | | | | |
| | | Initial | 5 MIN. | 10 | N | 16.11 | 17.4 | 14.8 | 0.77 | Pass |
| | | 30 cycles | 3 MIN. | 10 | N | 11.04 | 11.9 | 10.2 | 0.56 | Pass |
| | Inner contact (20278-112R-**) | | | | | | | | | |
| | Initial | 0.15 MIN. | 10 | N | 0.369 | 0.39 | 0.35 | 0.014 | Pass | |
| | 30 cycles | 0.10 MIN. | 10 | N | 0.230 | 0.25 | 0.22 | 0.011 | Pass | |
| D | Crimp strength | | | | | | | | | |
| | 20278-112R-08 | | | | | | | | | |
| | | - | 10N MIN. | 10 | N | 16.91 | 19.0 | 15.3 | 1.10 | Pass |
| | 20278-112R-13 | | | | | | | | | |
| | | - | 10N MIN. | 10 | N | 16.85 | 18.6 | 15.2 | 0.97 | Pass |
| | 20278-112R-32 | | | | | | | | | |
| | | - | 10N MIN. | 10 | N | 19.52 | 20.9 | 18.3 | 0.86 | Pass |
| 20278-112R-18 | | | | | | | | | | |
| | - | 15N MIN. | 10 | N | 24.92 | 27.4 | 22.9 | 1.31 | Pass | |

| Group | Test items | Specification | n | Unit | AVE. | MAX. | MIN. | S | Judgement | |
|--------------------------------------|--------------------------------------|----------------|----------------|------|----------------|----------------|------|------|-----------|------|
| | Measurements | | | | | | | | | |
| E | Durability | | | | | | | | | |
| | 20278-112R-08 | | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | | |
| | | Initial | 20 MAX. | 10 | mΩ | 13.25 | 13.9 | 12.3 | 0.45 | Pass |
| | | After testing | 25 MAX. | | | 12.98 | 13.4 | 11.9 | 0.43 | Pass |
| | Contact resistance of ground contact | | | | | | | | | |
| | | Initial | 10 MAX. | 10 | mΩ | 5.21 | 7.1 | 4.4 | 0.97 | Pass |
| | | After testing | 15 MAX. | | | 5.78 | 7.2 | 4.8 | 0.82 | Pass |
| | Appearance | | | | | | | | | |
| | | Initial | No abnormality | 10 | - | No abnormality | | | Pass | |
| | | After testing | | | | No abnormality | | | Pass | |
| | 20278-112R-13 | | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | | |
| | | Initial | 20 MAX. | 10 | mΩ | 6.45 | 7.1 | 6.1 | 0.30 | Pass |
| | | After testing | 25 MAX. | | | 6.40 | 6.8 | 6.1 | 0.23 | Pass |
| | Contact resistance of ground contact | | | | | | | | | |
| | | Initial | 10 MAX. | 10 | mΩ | 5.29 | 6.8 | 3.5 | 0.82 | Pass |
| | | After testing | 15 MAX. | | | 5.46 | 6.0 | 4.1 | 0.59 | Pass |
| | Appearance | | | | | | | | | |
| | | Initial | No abnormality | 10 | - | No abnormality | | | Pass | |
| | | After testing | | | | No abnormality | | | Pass | |
| | 20278-112R-32 | | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | | |
| | | Initial | 20 MAX. | 10 | mΩ | 6.77 | 7.0 | 6.5 | 0.22 | Pass |
| | After testing | 25 MAX. | 7.27 | | | 7.8 | 6.9 | 0.28 | Pass | |
| Contact resistance of ground contact | | | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 4.96 | 5.5 | 4.5 | 0.26 | Pass | |
| | After testing | 15 MAX. | | | 6.53 | 7.6 | 4.9 | 0.80 | Pass | |
| Appearance | | | | | | | | | | |
| | Initial | No abnormality | 10 | - | No abnormality | | | Pass | | |
| | After testing | | | | No abnormality | | | Pass | | |
| 20278-112R-18 | | | | | | | | | | |
| Contact resistance of main contact | | | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 8.52 | 9.0 | 8.3 | 0.22 | Pass | |
| | After testing | 25 MAX. | | | 9.12 | 9.4 | 8.5 | 0.28 | Pass | |
| Contact resistance of ground contact | | | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 4.87 | 5.5 | 4.2 | 0.40 | Pass | |
| | After testing | 15 MAX. | | | 5.74 | 8.0 | 3.2 | 1.65 | 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 | | | | | | | | |
| F | Cable retention force | | | | | | | | |
| | 20278-112R-08 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 12.98 | 13.9 | 12.2 | 0.61 | Pass |
| | After testing | 25 MAX. | | | 14.30 | 15.0 | 13.6 | 0.56 | Pass |
| | Contact resistance of ground contact | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 5.09 | 5.7 | 4.4 | 0.48 | Pass |
| | After testing | 15 MAX. | | | 6.00 | 7.0 | 5.2 | 0.51 | Pass |
| | Electrical discontinuity | | | | | | | | |
| | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. | | | | | | | | |
| | After testing | - | 10 | - | No abnormality | | | | Pass |
| | Appearance | | | | | | | | |
| | Initial | No abnormality | 10 | - | No abnormality | | | | Pass |
| | After testing | | | | No abnormality | | | | Pass |
| | 20278-112R-13 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 6.84 | 7.8 | 5.6 | 0.74 | Pass |
| | After testing | 25 MAX. | | | 6.67 | 7.7 | 6.0 | 0.53 | Pass |
| | Contact resistance of ground contact | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 4.19 | 4.8 | 4.0 | 0.26 | Pass |
| | After testing | 15 MAX. | | | 4.32 | 5.0 | 4.0 | 0.26 | Pass |
| | Electrical discontinuity | | | | | | | | |
| | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. | | | | | | | | |
| | After testing | - | 10 | - | No abnormality | | | | Pass |
| Appearance | | | | | | | | | |
| Initial | No abnormality | 10 | - | No abnormality | | | | Pass | |
| After testing | | | | No abnormality | | | | Pass | |
| 20278-112R-32 | | | | | | | | | |
| Contact resistance of main contact | | | | | | | | | |
| Initial | 20 MAX. | 10 | mΩ | 6.90 | 7.5 | 6.1 | 0.41 | Pass | |
| After testing | 25 MAX. | | | 7.20 | 8.2 | 6.6 | 0.43 | Pass | |
| Contact resistance of ground contact | | | | | | | | | |
| Initial | 10 MAX. | 10 | mΩ | 4.85 | 6.0 | 3.4 | 0.92 | Pass | |
| After testing | 15 MAX. | | | 5.51 | 6.3 | 4.9 | 0.49 | Pass | |
| Electrical discontinuity | | | | | | | | | |
| Spec: No creeping discharge, flashover, no insulator breakdown shall occur. | | | | | | | | | |
| After testing | - | 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 | | | | | | | | | |
| F | Cable retention force | | | | | | | | | |
| | 20278-112R-18 | | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | | |
| | | Initial | 20 MAX. | 10 | mΩ | 8.49 | 9.3 | 6.0 | 0.96 | Pass |
| | | After testing | 25 MAX. | | | 8.85 | 9.8 | 6.6 | 0.89 | Pass |
| | Contact resistance of ground contact | | | | | | | | | |
| | | Initial | 10 MAX. | 10 | mΩ | 5.05 | 5.7 | 4.5 | 0.47 | Pass |
| | | After testing | 15 MAX. | | | 5.37 | 6.3 | 4.2 | 0.80 | Pass |
| | Electrical discontinuity | | | | | | | | | |
| | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. | | | | | | | | | |
| | | After testing | - | 10 | - | No abnormality | | | Pass | |
| | Appearance | | | | | | | | | |
| | | Initial | No abnormality | 10 | - | No abnormality | | | Pass | |
| | | After testing | | | | No abnormality | | | Pass | |
| G | Vibration | | | | | | | | | |
| | 20278-112R-08 | | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | | |
| | | Initial | 20 MAX. | 10 | mΩ | 13.49 | 15.0 | 12.7 | 0.70 | Pass |
| | | After testing | 25 MAX. | | | 13.74 | 14.9 | 13.0 | 0.57 | Pass |
| | Contact resistance of ground contact | | | | | | | | | |
| | | Initial | 10 MAX. | 10 | mΩ | 5.24 | 7.6 | 4.3 | 1.06 | Pass |
| | | After testing | 15 MAX. | | | 4.96 | 6.9 | 3.8 | 1.13 | Pass |
| | Electrical discontinuity | | | | | | | | | |
| | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. | | | | | | | | | |
| | | After testing | - | 10 | - | No abnormality | | | Pass | |
| | Appearance | | | | | | | | | |
| | | Initial | No abnormality | 10 | - | No abnormality | | | Pass | |
| | | After testing | | | | No abnormality | | | Pass | |
| 20278-112R-13 | | | | | | | | | | |
| Contact resistance of main contact | | | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 6.90 | 7.5 | 6.6 | 0.30 | Pass | |
| | After testing | 25 MAX. | | | 6.76 | 7.4 | 6.5 | 0.27 | Pass | |
| Contact resistance of ground contact | | | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 4.71 | 6.6 | 4.0 | 0.87 | Pass | |
| | After testing | 15 MAX. | | | 4.66 | 6.5 | 4.0 | 0.79 | Pass | |
| Electrical discontinuity | | | | | | | | | | |
| Spec: No creeping discharge, flashover, no insulator breakdown shall occur. | | | | | | | | | | |
| | After testing | - | 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 | | | | | | | | |
| | 20278-112R-32 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 6.67 | 7.2 | 6.1 | 0.37 | Pass |
| | After testing | 25 MAX. | | | 6.67 | 7.1 | 6.1 | 0.37 | Pass |
| | Contact resistance of ground contact | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 5.03 | 5.7 | 4.6 | 0.38 | Pass |
| | After testing | 15 MAX. | | | 5.17 | 6.5 | 4.5 | 0.62 | Pass |
| | Electrical discontinuity | | | | | | | | |
| | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. | | | | | | | | |
| | After testing | - | 10 | - | No abnormality | | | | Pass |
| | Appearance | | | | | | | | |
| | Initial | No abnormality | 10 | - | No abnormality | | | | Pass |
| | After testing | | | | No abnormality | | | | Pass |
| | 20278-112R-18 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 8.83 | 10.1 | 7.8 | 0.74 | Pass |
| | After testing | 25 MAX. | | | 8.50 | 9.4 | 7.7 | 0.50 | Pass |
| | Contact resistance of ground contact | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 5.18 | 6.3 | 4.4 | 0.63 | Pass |
| | After testing | 15 MAX. | | | 5.20 | 6.0 | 4.5 | 0.45 | Pass |
| | Electrical discontinuity | | | | | | | | |
| | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. | | | | | | | | |
| | After testing | - | 10 | - | No abnormality | | | | Pass |
| Appearance | | | | | | | | | |
| Initial | No abnormality | 10 | - | No abnormality | | | | Pass | |
| After testing | | | | No abnormality | | | | Pass | |
| H | Shock | | | | | | | | |
| | 20278-112R-08 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 13.49 | 15.0 | 12.7 | 0.70 | Pass |
| | After testing | 25 MAX. | | | 13.04 | 15.0 | 12.0 | 0.87 | Pass |
| | Contact resistance of ground contact | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 5.24 | 7.6 | 4.3 | 1.06 | Pass |
| | After testing | 15 MAX. | | | 5.12 | 7.9 | 3.9 | 1.15 | Pass |
| | Electrical discontinuity | | | | | | | | |
| | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. | | | | | | | | |
| | After testing | - | 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 | | | | | | | | | |
| H | Shock | | | | | | | | | |
| | 20278-112R-13 | | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | | |
| | | Initial | 20 MAX. | 10 | mΩ | 6.90 | 7.5 | 6.6 | 0.30 | Pass |
| | | After testing | 25 MAX. | | | 7.07 | 8.0 | 6.7 | 0.37 | Pass |
| | Contact resistance of ground contact | | | | | | | | | |
| | | Initial | 10 MAX. | 10 | mΩ | 4.71 | 6.6 | 4.0 | 0.87 | Pass |
| | | After testing | 15 MAX. | | | 5.01 | 8.3 | 4.3 | 1.19 | Pass |
| | Electrical discontinuity | | | | | | | | | |
| | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. | | | | | | | | | |
| | | After testing | - | 10 | - | No abnormality | | | Pass | |
| | Appearance | | | | | | | | | |
| | | Initial | No abnormality | 10 | - | No abnormality | | | Pass | |
| | | After testing | | | | No abnormality | | | Pass | |
| | 20278-112R-32 | | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | | |
| | | Initial | 20 MAX. | 10 | mΩ | 6.67 | 7.2 | 6.1 | 0.37 | Pass |
| | | After testing | 25 MAX. | | | 6.73 | 7.4 | 6.4 | 0.39 | Pass |
| | Contact resistance of ground contact | | | | | | | | | |
| | | Initial | 10 MAX. | 10 | mΩ | 5.03 | 5.7 | 4.6 | 0.38 | Pass |
| | | After testing | 15 MAX. | | | 5.19 | 6.0 | 4.7 | 0.48 | Pass |
| | Electrical discontinuity | | | | | | | | | |
| | Spec: No creeping discharge, flashover, no insulator breakdown shall occur. | | | | | | | | | |
| | | After testing | - | 10 | - | No abnormality | | | Pass | |
| Appearance | | | | | | | | | | |
| | Initial | No abnormality | 10 | - | No abnormality | | | Pass | | |
| | After testing | | | | No abnormality | | | Pass | | |
| 20278-112R-18 | | | | | | | | | | |
| Contact resistance of main contact | | | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 8.83 | 10.1 | 7.8 | 0.74 | Pass | |
| | After testing | 25 MAX. | | | 8.79 | 9.3 | 8.0 | 0.47 | Pass | |
| Contact resistance of ground contact | | | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 5.18 | 6.3 | 4.4 | 0.63 | Pass | |
| | After testing | 15 MAX. | | | 5.22 | 5.9 | 4.3 | 0.56 | Pass | |
| Electrical discontinuity | | | | | | | | | | |
| Spec: No creeping discharge, flashover, no insulator breakdown shall occur. | | | | | | | | | | |
| | After testing | - | 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 | | | | | | | | | |
| J | Thermal shock | | | | | | | | | |
| | 20278-112R-08 | | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | | |
| | | Initial | 20 MAX. | 10 | mΩ | 13.59 | 14.5 | 12.8 | 0.50 | Pass |
| | | After testing | 25 MAX. | | | 13.71 | 14.3 | 13.3 | 0.34 | Pass |
| | Contact resistance of ground contact | | | | | | | | | |
| | | Initial | 10 MAX. | 10 | mΩ | 5.20 | 6.2 | 3.6 | 0.84 | Pass |
| | | After testing | 15 MAX. | | | 5.52 | 7.0 | 4.0 | 0.93 | 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 | |
| | 20278-112R-13 | | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | | |
| | | Initial | 20 MAX. | 10 | mΩ | 7.05 | 7.7 | 6.5 | 0.48 | Pass |
| | | After testing | 25 MAX. | | | 6.94 | 7.8 | 6.3 | 0.52 | Pass |
| | Contact resistance of ground contact | | | | | | | | | |
| | | Initial | 10 MAX. | 10 | mΩ | 4.61 | 5.0 | 4.0 | 0.33 | Pass |
| | | After testing | 15 MAX. | | | 4.84 | 5.7 | 4.1 | 0.44 | 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 | | |
| 20278-112R-32 | | | | | | | | | | |
| Contact resistance of main contact | | | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 6.62 | 8.0 | 6.1 | 0.54 | Pass | |
| | After testing | 25 MAX. | | | 6.61 | 7.6 | 5.9 | 0.52 | Pass | |
| Contact resistance of ground contact | | | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 4.98 | 6.5 | 4.2 | 0.70 | Pass | |
| | After testing | 15 MAX. | | | 5.26 | 6.4 | 4.3 | 0.75 | 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 |
|-------|--------------------------------------|----------------|----|------|----------------|------|------|------|-----------|
| | Measurements | | | | | | | | |
| J | Thermal shock | | | | | | | | |
| | 20278-112R-18 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 8.88 | 9.2 | 8.6 | 0.15 | Pass |
| | After testing | 25 MAX. | | | 8.92 | 10.2 | 8.4 | 0.53 | Pass |
| | Contact resistance of ground contact | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 4.65 | 5.7 | 3.9 | 0.62 | Pass |
| | After testing | 15 MAX. | | | 4.67 | 5.9 | 4.1 | 0.69 | 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 |
| K | Humidity(Steady State) | | | | | | | | |
| | 20278-112R-08 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 13.51 | 14.0 | 12.8 | 0.40 | Pass |
| | After testing | 25 MAX. | | | 13.06 | 14.1 | 12.6 | 0.48 | Pass |
| | Contact resistance of ground contact | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 5.35 | 6.8 | 4.1 | 0.90 | Pass |
| | After testing | 15 MAX. | | | 4.81 | 6.2 | 4.1 | 0.80 | 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 |
| | 20278-112R-13 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 5.48 | 5.9 | 5.1 | 0.29 | Pass |
| | After testing | 25 MAX. | | | 6.39 | 7.2 | 5.8 | 0.45 | Pass |
| | Contact resistance of ground contact | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 5.78 | 6.8 | 5.0 | 0.53 | Pass |
| | After testing | 15 MAX. | | | 5.99 | 7.1 | 4.7 | 0.87 | 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 |
|--------------------------------------|--------------------------------------|----------------|----|----------------|----------------|------|------|------|-----------|
| | Measurements | | | | | | | | |
| K | Humidity(Steady State) | | | | | | | | |
| | 20278-112R-32 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 6.76 | 7.2 | 6.4 | 0.27 | Pass |
| | After testing | 25 MAX. | | | 6.41 | 6.9 | 6.0 | 0.26 | Pass |
| | Contact resistance of ground contact | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 4.55 | 6.5 | 3.3 | 1.08 | Pass |
| | After testing | 15 MAX. | | | 4.97 | 6.8 | 4.2 | 0.78 | 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 |
| | 20278-112R-18 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 8.79 | 9.6 | 8.2 | 0.36 | Pass |
| | After testing | 25 MAX. | | | 8.83 | 9.3 | 8.3 | 0.30 | Pass |
| Contact resistance of ground contact | | | | | | | | | |
| Initial | 10 MAX. | 10 | mΩ | 4.79 | 5.7 | 4.3 | 0.41 | Pass | |
| After testing | 15 MAX. | | | 4.47 | 5.5 | 4.0 | 0.42 | 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 | |
| L | Salt water spray | | | | | | | | |
| | 20278-112R-08 | | | | | | | | |
| | Appearance | | | | | | | | |
| | Initial | No abnormality | 10 | - | No abnormality | | | | Pass |
| | After testing | | | | No abnormality | | | | Pass |
| | 20278-112R-13 | | | | | | | | |
| | Appearance | | | | | | | | |
| | Initial | No abnormality | 10 | - | No abnormality | | | | Pass |
| | After testing | | | | No abnormality | | | | Pass |
| | 20278-112R-32 | | | | | | | | |
| | Appearance | | | | | | | | |
| | Initial | No abnormality | 10 | - | No abnormality | | | | Pass |
| After testing | No abnormality | | | | Pass | | | | |
| 20278-112R-18 | | | | | | | | | |
| 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 | | | | | | | | |
| M | High Temperature Life | | | | | | | | |
| | 20278-112R-08 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 13.40 | 15.4 | 12.8 | 0.76 | Pass |
| | After testing | 25 MAX. | | | 13.17 | 14.2 | 12.4 | 0.49 | Pass |
| | Contact resistance of ground contact | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 4.97 | 6.3 | 4.2 | 0.67 | Pass |
| | After testing | 15 MAX. | | | 5.20 | 6.4 | 4.1 | 0.66 | Pass |
| | Appearance | | | | | | | | |
| | Initial | No abnormality | 10 | - | No abnormality | | | | Pass |
| | After testing | | | | No abnormality | | | | Pass |
| | 20278-112R-13 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 5.93 | 7.5 | 5.3 | 0.69 | Pass |
| | After testing | 25 MAX. | | | 6.94 | 7.8 | 6.3 | 0.45 | Pass |
| | Contact resistance of ground contact | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 5.72 | 7.6 | 4.6 | 1.08 | Pass |
| | After testing | 15 MAX. | | | 7.19 | 8.9 | 6.1 | 1.14 | Pass |
| | Appearance | | | | | | | | |
| | Initial | No abnormality | 10 | - | No abnormality | | | | Pass |
| | After testing | | | | No abnormality | | | | Pass |
| 20278-112R-32 | | | | | | | | | |
| Contact resistance of main contact | | | | | | | | | |
| Initial | 20 MAX. | 10 | mΩ | 6.97 | 7.5 | 6.4 | 0.35 | Pass | |
| After testing | 25 MAX. | | | 7.34 | 8.2 | 6.6 | 0.50 | Pass | |
| Contact resistance of ground contact | | | | | | | | | |
| Initial | 10 MAX. | 10 | mΩ | 5.00 | 5.9 | 4.4 | 0.41 | Pass | |
| After testing | 15 MAX. | | | 5.97 | 7.4 | 5.3 | 0.67 | 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 | | | | | | | | |
| M | High Temperature Life | | | | | | | | |
| | 20278-112R-18 | | | | | | | | |
| | Contact resistance of main contact | | | | | | | | |
| | Initial | 20 MAX. | 10 | mΩ | 8.86 | 9.4 | 8.5 | 0.29 | Pass |
| | After testing | 25 MAX. | | | 9.61 | 10.5 | 9.2 | 0.40 | Pass |
| | Contact resistance of ground contact | | | | | | | | |
| | Initial | 10 MAX. | 10 | mΩ | 4.56 | 5.1 | 3.8 | 0.45 | Pass |
| | After testing | 15 MAX. | | | 5.14 | 5.8 | 4.5 | 0.43 | 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 |

















