MHF® 5 Connector

(AWG#38φ0.48 Cable)

Part No. Plug: 20615-001R-48 Receptacle: 20566-001E-01

Test Report

Product Specification no. PRS-1939

Rev.	ECN	Date	Prepared by	Checked by	Approved by
3	T21095	October 22, 2021	K. Ikeshita		M. Takemoto
2	T21021	March 31, 2021	N.Miyashiro	K.Ikeshita	M.Takemoto
1	T16071	May 4, 2016	M.N		Ken
0	T14033	March 20, 2014	Y.Hashimoto	K.Yotsutani	T.Takano

MHF 5 Connector (AWG#38φ0.48 Cable) Test Report

1. Purpose

To evaluate the performance of MHF 5 Connector in accordance with PRS-1939.

2. Specimen

(1) MHF 5 PLUG （Part No. 20615-001R-48）
(2) MHF 5 RECEPTACLE （Part No. 20566-001E-01）
Cable: AWG#38 coaxial cable (jacket diameter 0.48mm)

3. Test Sequence

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

4. Result

See Table 2-1 to 2-4, Graph 1 to 11. For the details of the testing conditions and requirements, see PRS-1939.
The “n” in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-1939.

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, 5	1, 5	1, 3	1, 3	1, 3		
Insulation Resistance								2, 6	2, 6					
D. W. Voltage								3, 7	3, 7					
VSWR	1													
Unmating force		1												
Durability			2											
Crimp Strength				1										
Cable Retention Force					1									
Vibration						2								
Shock							2							
Humidity (Steady State)								4						
Thermal Shock									4					
High Temperature Life										2				
H2S Gas											2			
Salt Water Spray												2		
Solder ability													1	
Soldering Heat Resistance														1
Specimen quantity	10	10	10	10	10	10	10	10	10	10	10	10	10	10

※Numbers indicate test sequences

Table 2-1

Group	Test items / Measurements	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement
A	VSWR								
	Plug								
	0.1～3.0GHz	1.3 MAX.	10	-	1.168	1.18	1.15	0.006	Pass
	3.0～6.0GHz	1.5 MAX.		-	1.222	1.24	1.20	0.011	Pass
	6.0～9.0GHz	1.6 MAX.		-	1.274	1.31	1.23	0.023	Pass
	9.0～12.0GHz	1.6 MAX.		-	1.273	1.33	1.21	0.032	Pass
	Receptacle								
	0.1～3.0GHz	1.3 MAX.	10	-	1.093	1.11	1.07	0.017	Pass
	3.0～6.0GHz	1.4 MAX.		-	1.096	1.12	1.07	0.017	Pass
	6.0～9.0GHz	1.5 MAX.		-	1.224	1.24	1.19	0.018	Pass
	9.0～12.0GHz	1.5 MAX.		-	1.243	1.27	1.20	0.034	Pass
B	Unmating force								
	Initial	4N MIN.	10	N	10.57	11.9	9.6	0.86	Pass
	After 30 cycles	2N MIN.			5.76	6.9	4.7	0.76	Pass
C	Durability								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	10.73	12.8	10.0	0.82	Pass
	After 30 cycles	-			11.80	13.4	10.8	0.72	-
	⊿R	⊿20mΩ MAX.			1.07	2.3	0.3	0.61	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	7.75	8.6	7.1	0.50	Pass
	After 30 cycles	-			8.78	9.5	7.9	0.55	-
	⊿R	⊿20mΩ MAX.			1.03	1.8	0.1	0.52	Pass
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-	No abnormality				Pass
	After testing				No abnormality				Pass
D	Crimp strength								
	-	7N MIN.	10	N	10.38	11.00	9.80	0.39	Pass
E	Cable retention force								
	Electrical discontinuity								
	Spec: No electrical discontinuity grater than 1μs shall occur.								
	After testing	-	10	-	No abnormality				Pass

Table 2-2

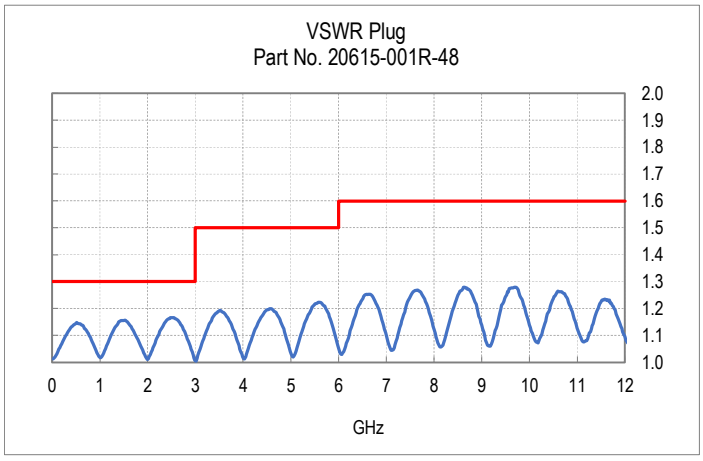
Group	Test items / Measurements	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement
F	Vibration								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	11.34	12.1	10.3	0.56	Pass
	After 30 cycles	-			11.52	12.5	10.8	0.58	-
	⊿R	⊿20mΩ MAX.			0.18	1.6	-0.7	0.66	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	7.50	8.0	7.1	0.29	Pass
	After 30 cycles	-			8.42	9.5	8.0	0.51	-
	⊿R	⊿20mΩ MAX.			-0.75	0.9	-2.0	0.71	Pass
	Electrical discontinuity								
	Spec: No electrical discontinuity grater than 1μs shall occur.								
	After testing	-	10	-	No abnormality				Pass
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-	No abnormality				Pass
	After testing				No abnormality				Pass
G	Shock								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	12.07	13.9	11.1	0.83	Pass
	After 30 cycles	-			11.65	13.0	10.7	0.73	-
	⊿R	⊿20mΩ MAX.			-0.42	0.1	-1.0	0.33	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	7.77	9.0	7.3	0.59	Pass
	After 30 cycles	-			8.79	9.9	8.1	0.59	-
	⊿R	⊿20mΩ MAX.			1.02	2.4	-0.3	0.89	Pass
	Electrical discontinuity								
	Spec: No electrical discontinuity grater than 1μs shall occur.								
	After testing	-	10	-	No abnormality				Pass
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-	No abnormality				Pass
	After testing				No abnormality				Pass
H	Humidity(Steady State)								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	10.92	12.0	10.3	0.55	Pass
	After 30 cycles	-			11.28	12.2	10.4	0.69	-
	⊿R	⊿20mΩ MAX.			0.36	1.1	-0.2	0.36	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	7.40	9.2	5.6	1.07	Pass
	After 30 cycles	-			8.34	9.4	6.1	1.05	-
	⊿R	⊿20mΩ MAX.			0.93	2.9	-1.6	1.58	Pass
	Insulation residence								
	Initial	500MΩ MIN.	10	MΩ	10,000MΩ MIN.				Pass
	After testing	100MΩ MIN.			10,000MΩ MIN.				Pass
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-	No abnormality				Pass
	After testing				No abnormality				Pass

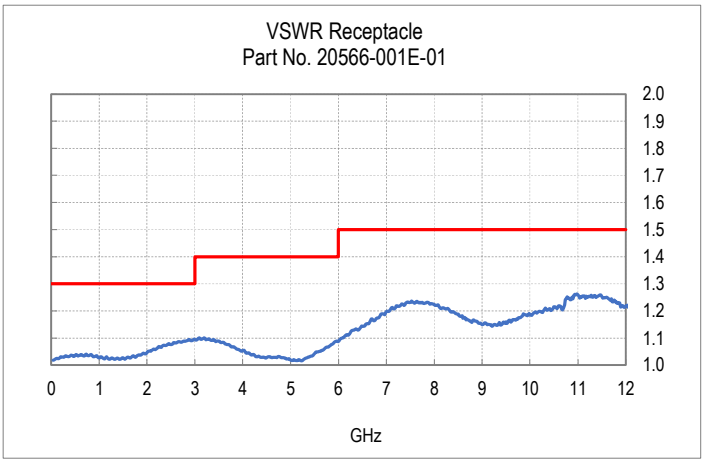
Table 2-3

Group	Test items / Measurements	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement
J	Thermal shock								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	12.12	13.4	10.2	1.11	Pass
	After 30 cycles	-			11.78	13.0	9.2	1.31	-
	⊿R	⊿20mΩ MAX.			0.34	2.0	-0.4	0.68	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	7.57	9.2	5.6	0.89	Pass
	After 30 cycles	-			7.79	9.6	6.7	0.89	-
	⊿R	⊿20mΩ MAX.			0.22	2.2	-2.1	1.67	Pass
	Insulation residence								
	Initial	500MΩ MIN.	10	MΩ	10,000MΩ MIN.				Pass
	After testing	100MΩ MIN.			10,000MΩ MIN.				Pass
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-	No abnormality				Pass
	After testing				No abnormality				Pass
K	High temperature life								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	12.58	13.2	11.7	0.50	Pass
	After 30 cycles	-			11.90	13.3	10.3	0.99	-
	⊿R	⊿20mΩ MAX.			-0.68	0.6	-2.7	1.23	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	7.39	8.9	6.1	0.77	Pass
	After 30 cycles	-			8.78	9.9	7.6	0.79	-
	⊿R	⊿20mΩ MAX.			1.38	2.3	0.6	0.65	Pass
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-	No abnormality				Pass
	After testing				No abnormality				Pass
L	H2S gas								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	12.47	14.3	11.6	0.84	Pass
	After 30 cycles	-			11.85	14.3	10.3	1.06	-
	⊿R	⊿20mΩ MAX.			-0.62	0.2	-1.7	0.63	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	8.26	9.2	7.5	0.63	Pass
	After 30 cycles	-			9.11	9.9	8.2	0.49	-
	⊿R	⊿20mΩ MAX.			0.85	2.0	-0.8	0.91	Pass
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-	No abnormality				Pass
	After testing				No abnormality				Pass

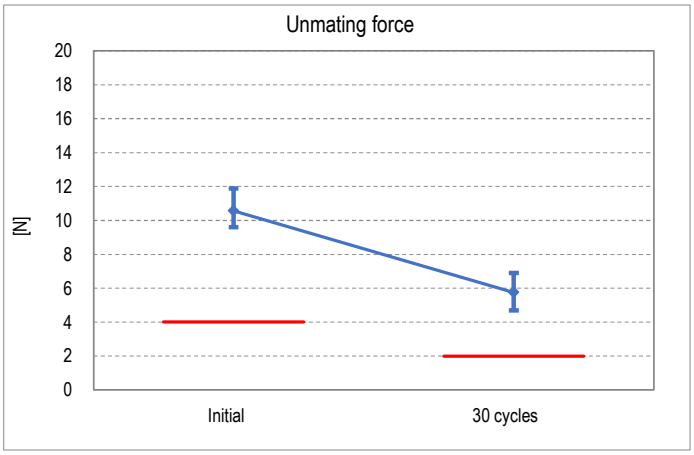
Table 2-4

Group	Test items / Measurements	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement
M	Saltwater spray								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	12.30	13.5	11.2	0.67	Pass
	After 30 cycles	-			11.08	12.1	9.9	0.87	-
	⊿R	⊿20mΩ MAX.			-1.15	-0.1	-2.8	0.87	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	7.65	9.4	6.4	1.05	Pass
	After 30 cycles	-			8.76	9.3	7.9	0.50	-
	⊿R	⊿20mΩ MAX.			1.11	2.8	-1.5	1.25	Pass
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	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

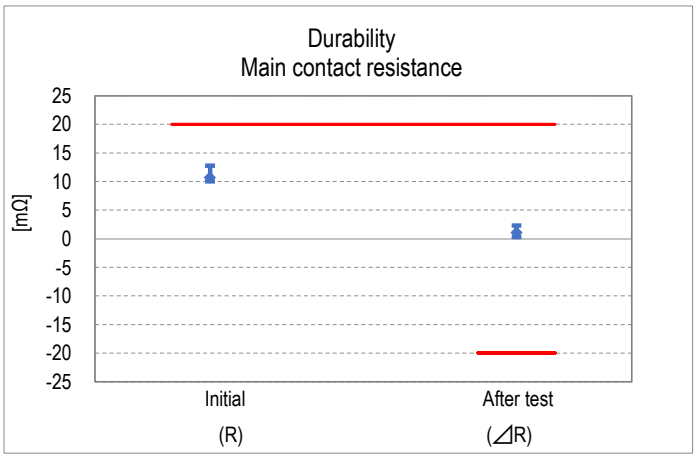


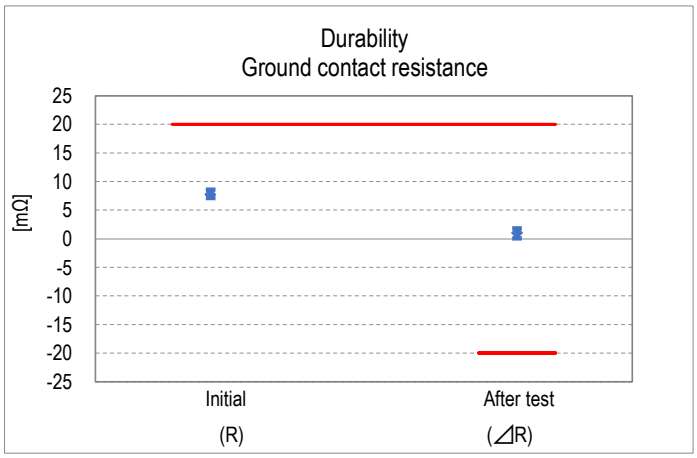


Graph 1

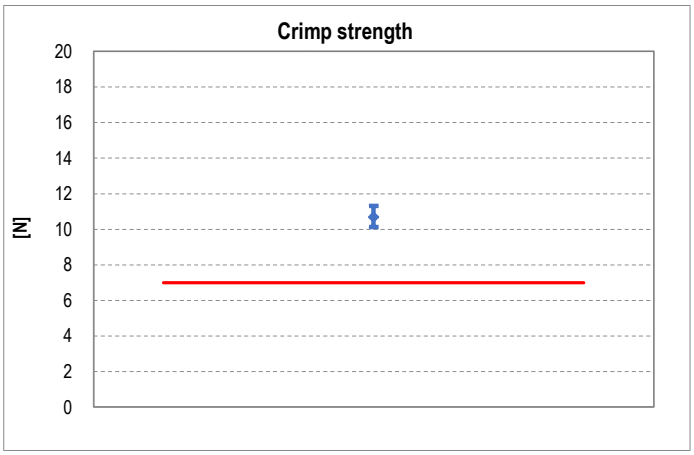


Graph 2

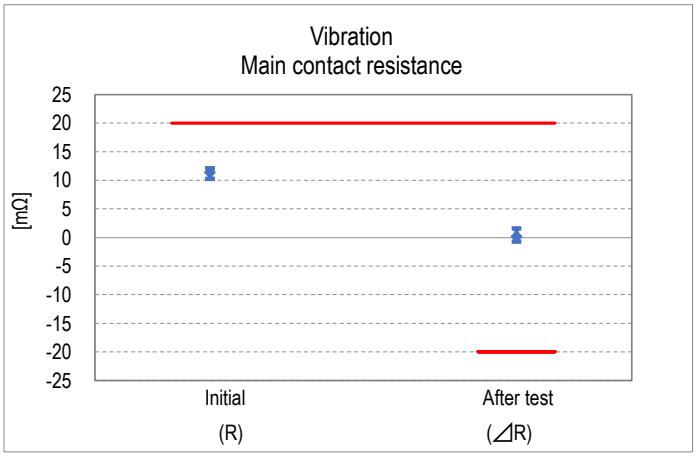


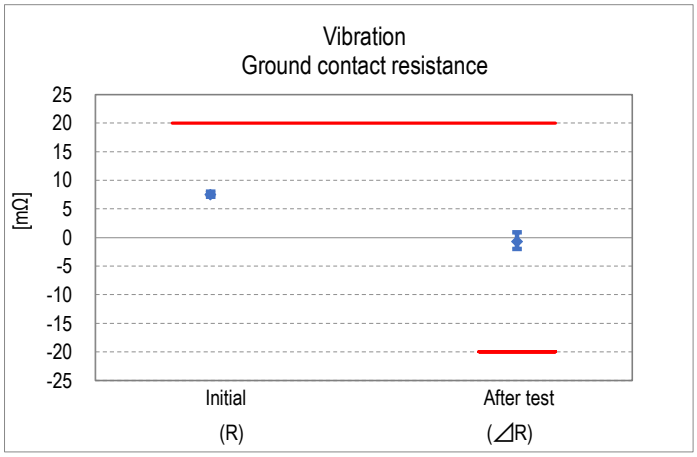


Graph 3

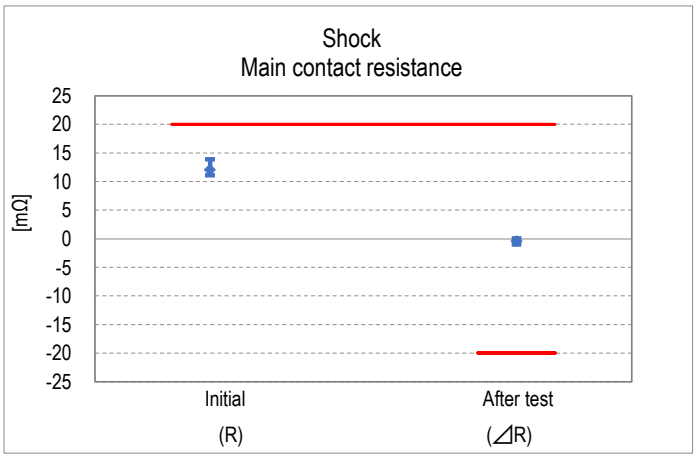


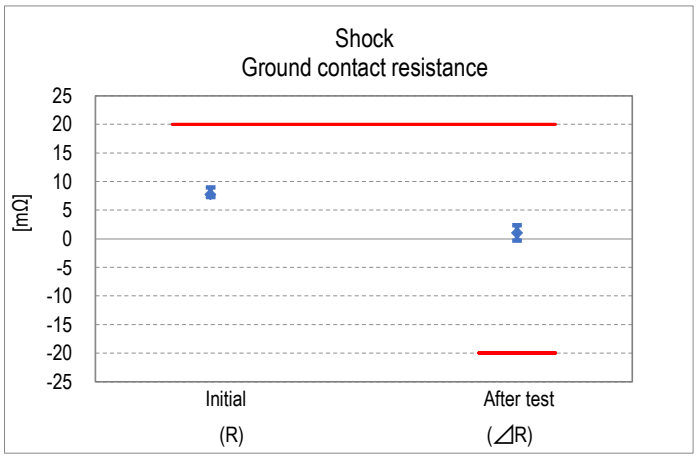
Graph 4





Graph 5





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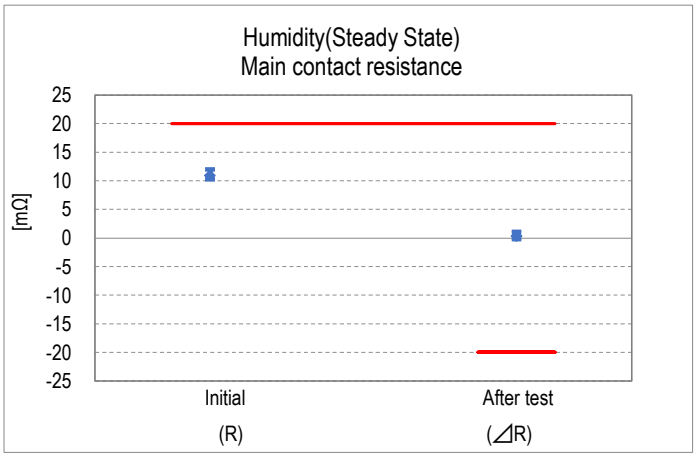
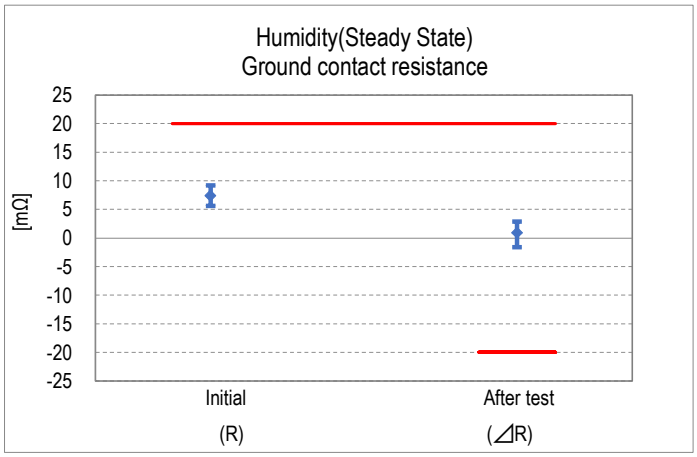
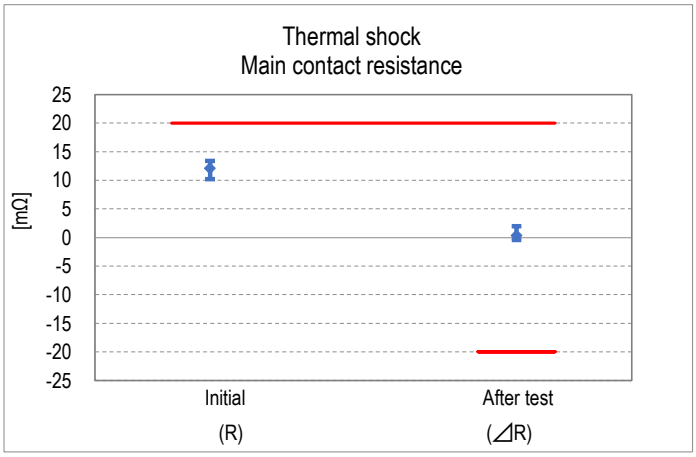
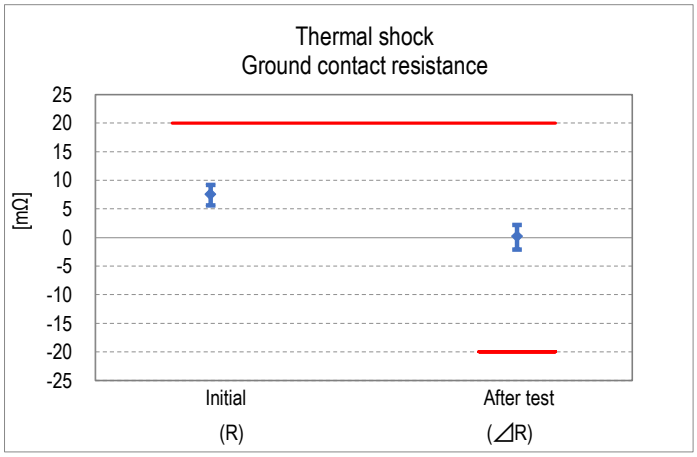


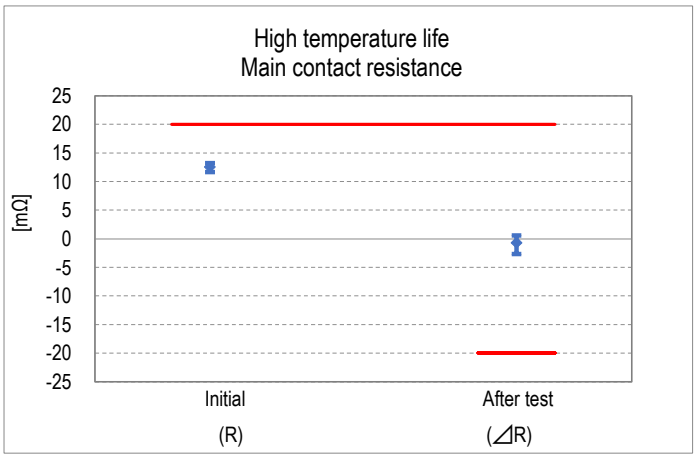


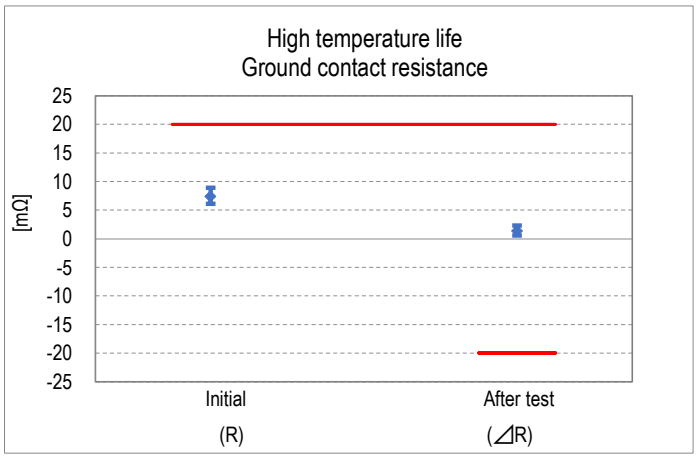
Graph 7



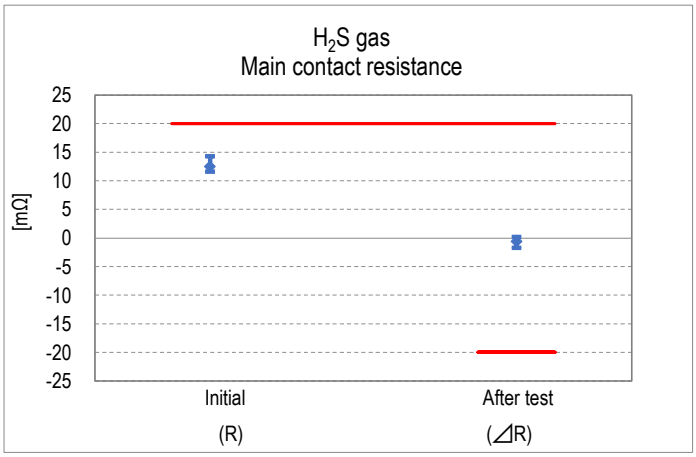


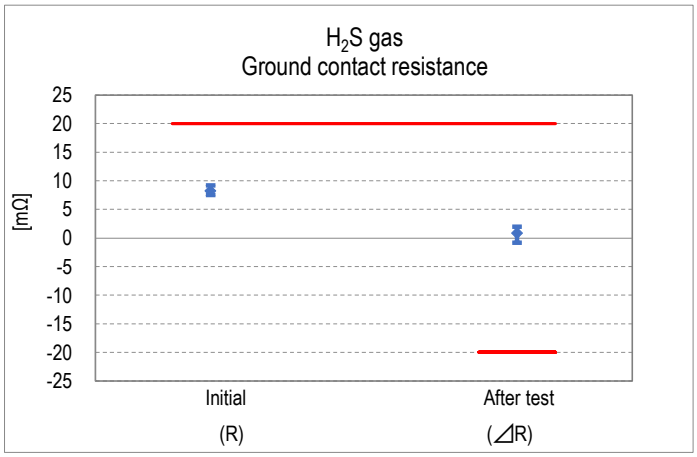
Graph 8



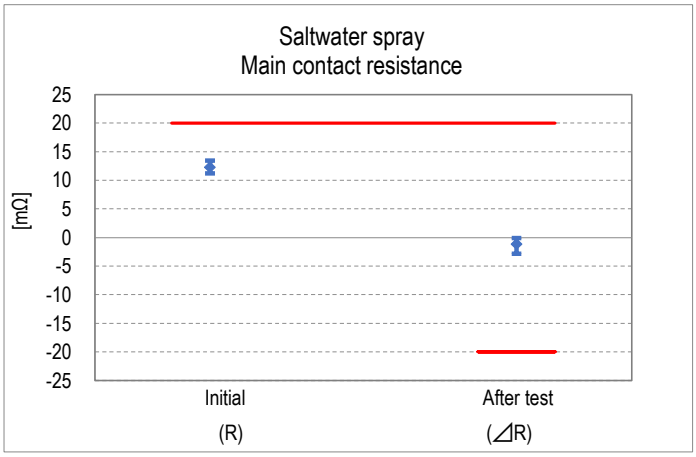


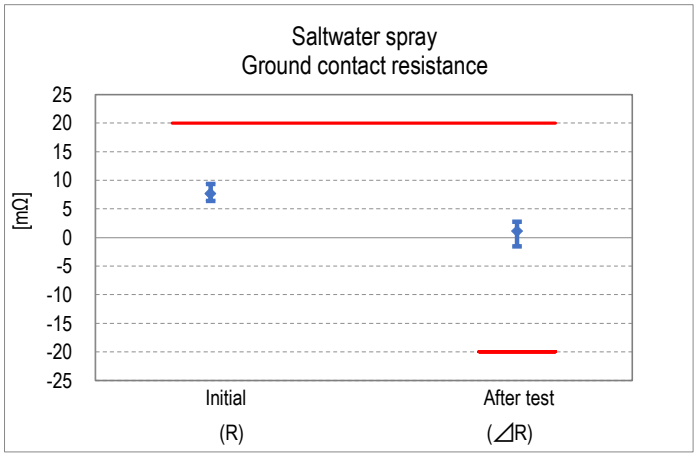
Graph 9





Graph 10


Saltwater spray
Main contact resistance
[mΩ]
25
20
15
10
5
0
-5
-10
-15
-20
-25
Initial
(R)
After test
(⊿R)


Saltwater spray
Ground contact resistance
[mΩ]
25
20
15
10
5
0
-5
-10
-15
-20
-25
Initial
(R)
After test
(⊿R)

Graph 11