

MHF[®] 5 Connector(AWG#36 φ0.81 Cable)

Plug Part No. 20711-001R-81 / Receptacle Part No. 20566-001E-01

Test Report

Product Specification no. PRS-2108

5	T22099	June 20, 2022	K.Watanabe	K.Yufu	Y.Hashimoto
4	T21105	October 27, 2021	K. Ikeshita		M. Takemoto
3	T21018	March 22, 2021	N.Miyashiro	K.Ikeshita	M.Takemoto
2	T18090	August 8, 2018	M.Nomoto	K.Yufu	K.Yotsutani
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of MHF 5 Connector in accordance with PRS-2108.

2. Specimen

- (1) MHF 5 PLUG (Part No. 20711-001R-81)
 - (2) MHF 5 RECEPTACLE (Part No. 20566-001E-01)
- Cable: AWG#36 coaxial cable (jacket diameter 0.81mm)

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-2108.

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

5. Conclusion

All the specimens met the requirements of PRS-2108.

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 (pcs.)	Plug	10	10	10	-	10	10	10	10	10	10	10	10	-	-
	Receptacle	5			10									10	10

※Numbers indicate test sequences

Table 2-1

Group	Test items		Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement
	Measurements									
A	VSWR									
	Plug									
		0.1~3.0GHz	1.30 MAX.	10	-	1.103	1.12	1.09	0.010	Pass
		3.0~6.0GHz	1.50 MAX.		-	1.241	1.28	1.22	0.019	Pass
		6.0~9.0GHz	1.60 MAX.		-	1.411	1.47	1.38	0.032	Pass
		9.0~12.0GHz	1.70 MAX.		-	1.548	1.62	1.50	0.039	Pass
	Receptacle									
		0.1~3.0GHz	1.30 MAX.	5	-	1.083	1.09	1.07	0.008	Pass
		3.0~6.0GHz	1.40 MAX.		-	1.180	1.20	1.17	0.012	Pass
		6.0~9.0GHz	1.50 MAX.		-	1.213	1.23	1.19	0.018	Pass
		9.0~12.0GHz	1.50 MAX.		-	1.234	1.26	1.22	0.017	Pass
		12.0~15.0GHz	1.65 MAX.		-	1.410	1.455	1.382	0.033	Pass
	B	Unmating force								
Initial		4N MIN.	10	N	10.43	11.4	9.5	0.70	Pass	
After 30 cycles		2N MIN.			5.61	6.5	5.0	0.50	Pass	
C	Durability									
	Contact resistance of main contact									
	Initial	20mΩ MAX.	10	mΩ	12.93	14.2	11.7	1.01	Pass	
	After 30 cycles	-			14.90	16.5	13.5	1.03	-	
	ΔR	Δ20mΩ MAX.			1.97	2.9	0.4	0.77	Pass	
	Contact resistance of Ground contact									
	Initial	20mΩ MAX.	10	mΩ	6.01	7.5	4.5	0.89	Pass	
	After 30 cycles	-			6.58	7.7	5.9	0.60	-	
	ΔR	Δ100mΩ MAX.			0.66	1.7	-0.4	0.66	Pass	
	Appearance									
Spec: No abnormality adversely affecting the performance shall occur.										
Initial	No abnormality	10	-	No abnormality				Pass		
After testing	No abnormality			No abnormality				Pass		
D	Crimp strength									
	-	7N MIN.	10	N	10.69	11.47	9.82	0.48	Pass	
E	Cable retention force									
	Electrical discontinuity									
	Spec: No electrical discontinuity greater than 1μs shall occur.									
	After testing	-	10	-	No abnormality				Pass	

Table 2-2

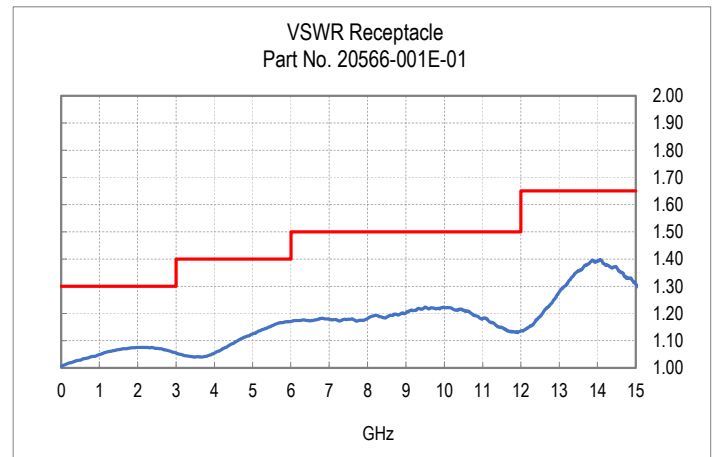
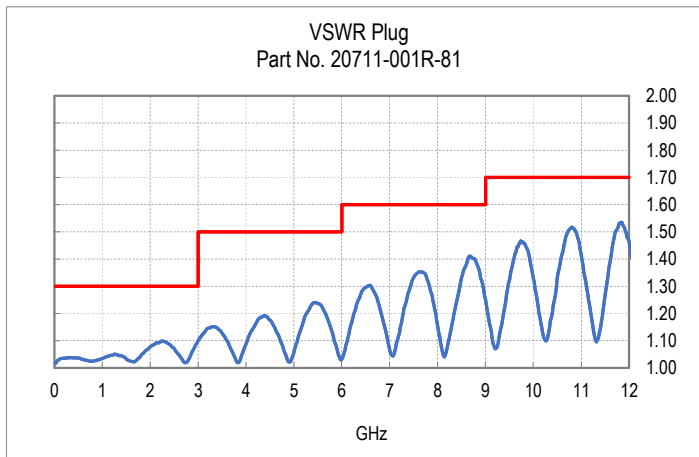
Group	Test items	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement	
	Measurements									
F	Vibration									
	Contact resistance of main contact									
		Initial	20mΩ MAX.	10	mΩ	13.31	14.6	11.5	0.96	Pass
		After 30 cycles	-			14.86	16.4	12.5	1.09	-
		ΔR	Δ20mΩ MAX.			1.54	2.9	0.2	0.82	Pass
	Contact resistance of Ground contact									
		Initial	20mΩ MAX.	10	mΩ	6.00	6.9	5.3	0.45	Pass
		After 30 cycles	-			6.57	7.9	5.9	0.58	-
		ΔR	Δ100mΩ MAX.			0.57	2.6	0.1	0.72	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	13.30	15.3	10.9	1.52	Pass
		After 30 cycles	-			14.07	15.8	11.8	1.47	-
		ΔR	Δ20mΩ MAX.			0.77	2.1	-0.7	0.91	Pass
	Contact resistance of Ground contact									
		Initial	20mΩ MAX.	10	mΩ	5.82	6.5	5.2	0.43	Pass
		After 30 cycles	-			6.60	7.6	5.4	0.68	-
		ΔR	Δ100mΩ MAX.			0.79	2.2	-0.2	0.86	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	12.66	14.7	11.0	1.23	Pass
		After 30 cycles	-			13.57	15.3	12.4	1.11	-
		ΔR	Δ20mΩ MAX.			0.91	2.6	-0.7	0.91	Pass
	Contact resistance of Ground contact									
		Initial	20mΩ MAX.	10	mΩ	5.63	6.1	5.1	0.37	Pass
		After 30 cycles	-			7.18	8.9	5.2	1.23	-
		ΔR	Δ100mΩ MAX.			1.55	2.8	0.1	0.97	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

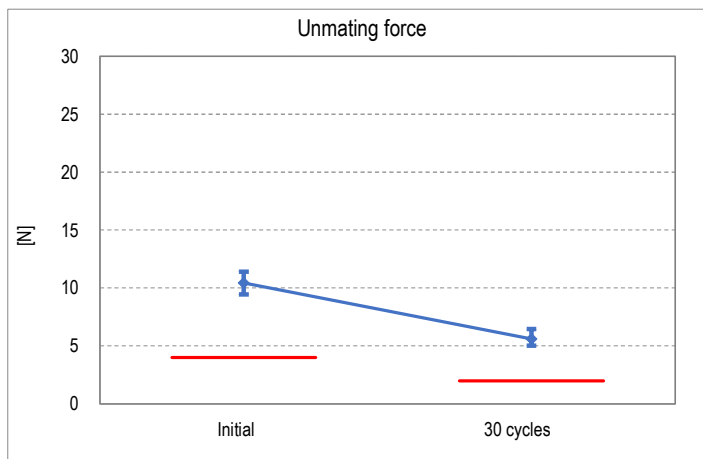
Group	Test items	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement	
	Measurements									
J	Thermal shock									
	Contact resistance of main contact									
		Initial	20mΩ MAX.	10	mΩ	13.69	15.4	11.5	1.29	Pass
		After 30 cycles	-			14.85	16.4	12.5	1.52	-
		ΔR	Δ20mΩ MAX.			1.16	3.0	-2.1	1.83	Pass
	Contact resistance of Ground contact									
		Initial	20mΩ MAX.	10	mΩ	5.90	6.5	5.1	0.53	Pass
		After 30 cycles	-			7.20	8.2	5.4	0.88	-
		ΔR	Δ100mΩ MAX.			1.30	2.7	0.3	0.77	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	13.23	15.4	10.5	1.47	Pass
		After 30 cycles	-			15.93	18.5	11.4	1.88	-
		ΔR	Δ20mΩ MAX.			2.70	4.8	-0.2	1.30	Pass
	Contact resistance of Ground contact									
		Initial	20mΩ MAX.	10	mΩ	5.80	6.9	5.2	0.60	Pass
		After 30 cycles	-			7.79	9.6	5.4	1.44	-
		ΔR	Δ100mΩ MAX.			1.99	4.1	0.0	1.36	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	12.77	14.6	11.0	1.21	Pass
		After 30 cycles	-			15.44	18.5	12.4	1.74	-
		ΔR	Δ20mΩ MAX.			2.67	6.6	1.4	1.47	Pass
Contact resistance of Ground contact										
		Initial	20mΩ MAX.	10	mΩ	5.91	6.5	5.0	0.55	Pass
		After 30 cycles	-			6.82	7.8	5.5	0.82	-
		ΔR	Δ100mΩ MAX.			0.91	2.1	-0.5	0.83	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

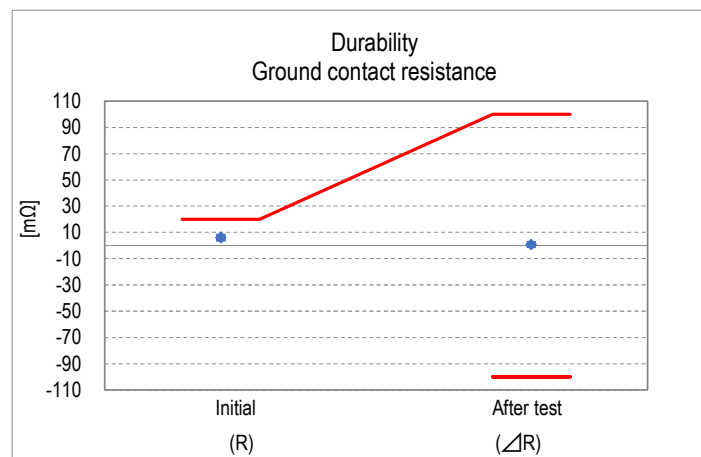
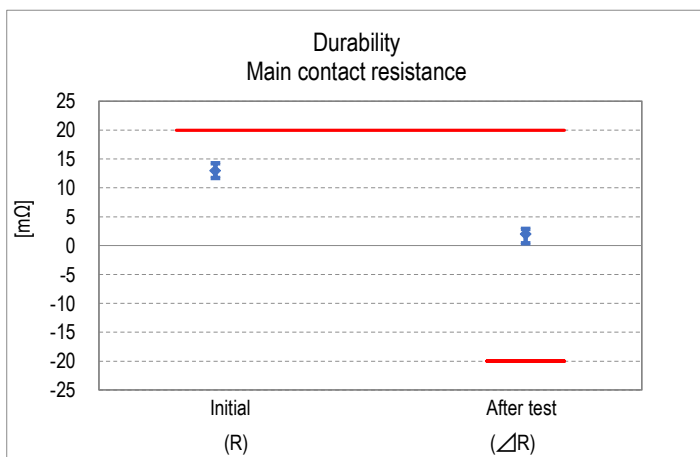
Group	Test items	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement	
	Measurements									
M	Saltwater spray									
	Contact resistance of main contact									
		Initial	20mΩ MAX.	10	mΩ	13.16	15.0	11.4	1.25	Pass
		After 30 cycles	-			14.33	16.3	11.3	1.59	-
		ΔR	Δ20mΩ MAX.			1.17	3.2	-1.2	1.35	Pass
	Contact resistance of Ground contact									
		Initial	20mΩ MAX.	10	mΩ	5.98	6.9	5.1	0.79	Pass
		After 30 cycles	-			6.74	8.2	5.3	0.92	-
		ΔR	Δ100mΩ MAX.			0.76	1.8	-0.3	0.78	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	



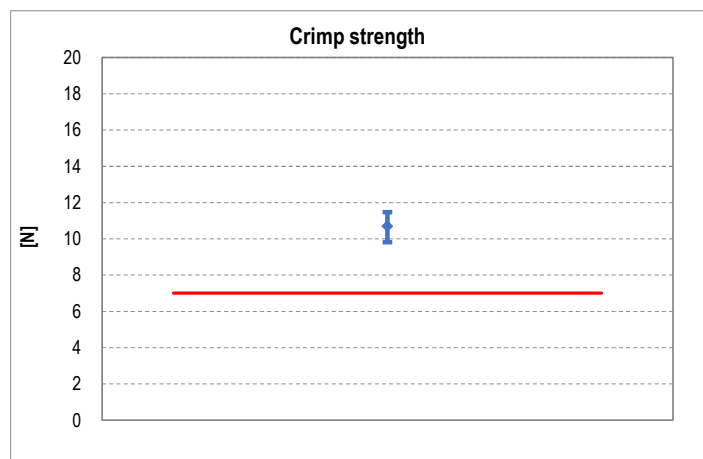
Graph 1



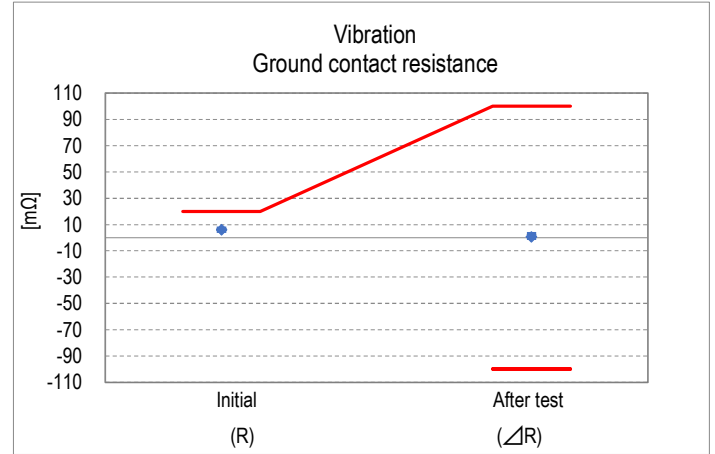
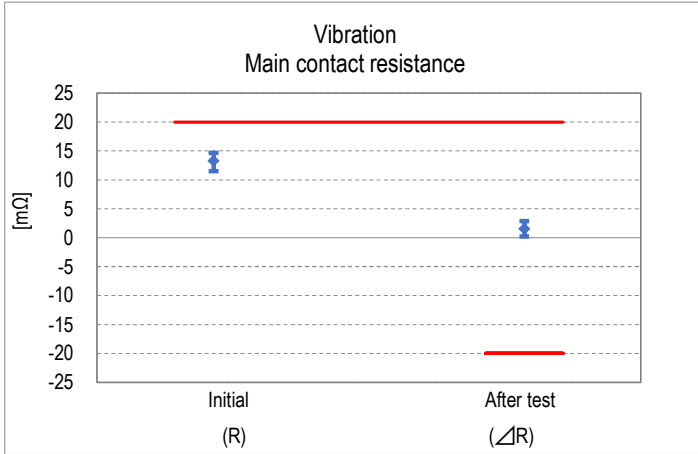
Graph 2



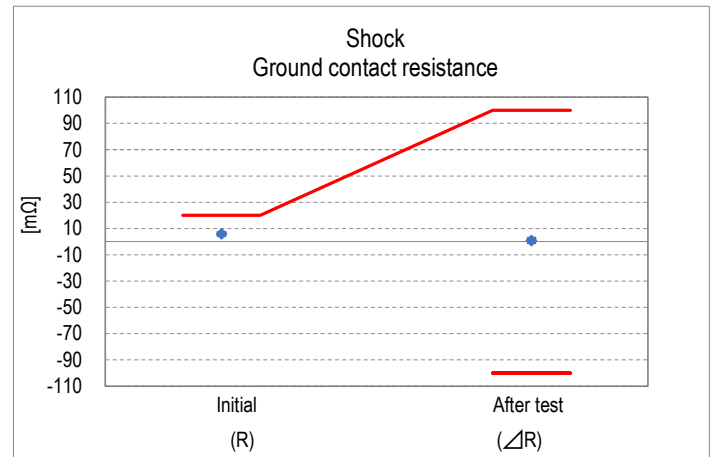
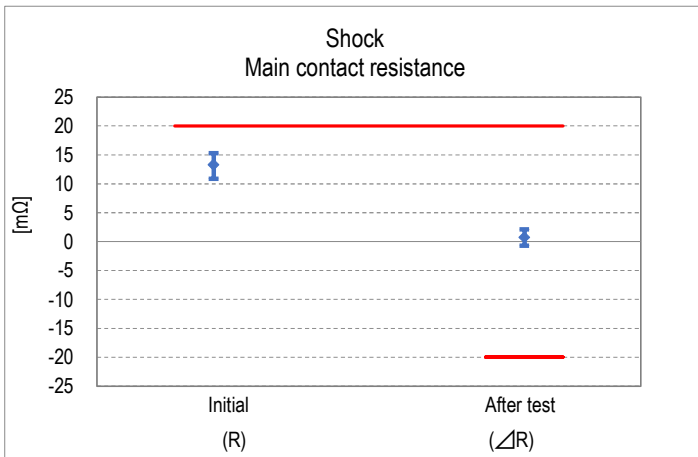
Graph 3



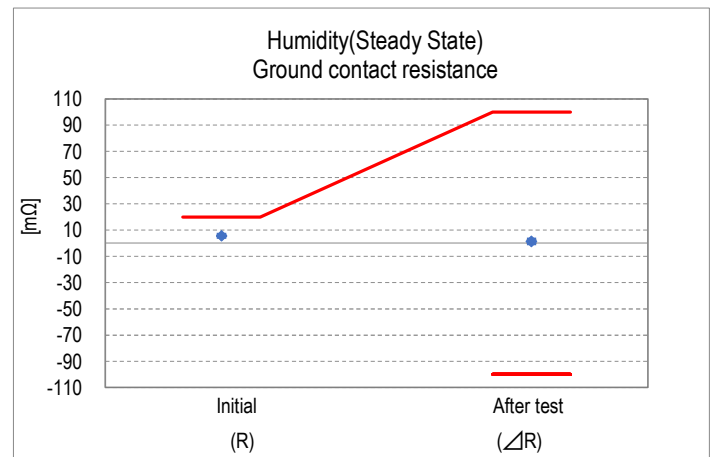
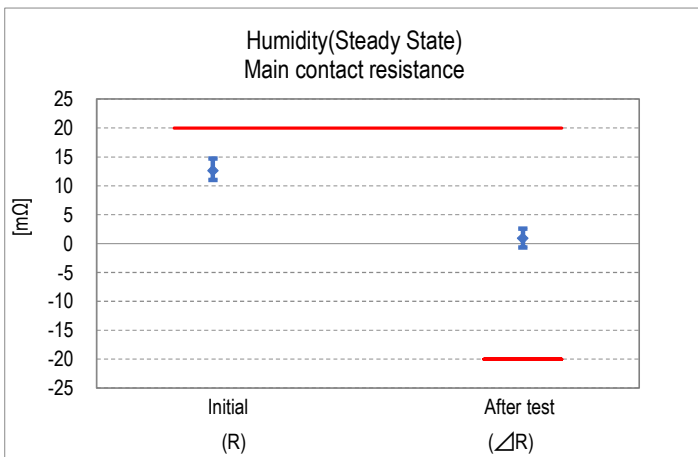
Graph 4



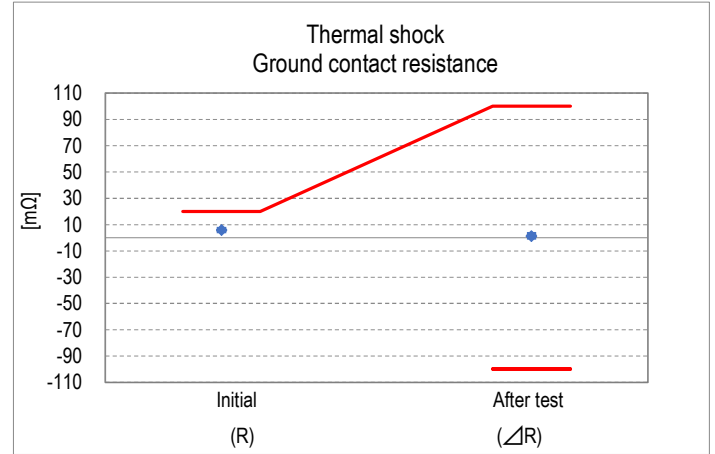
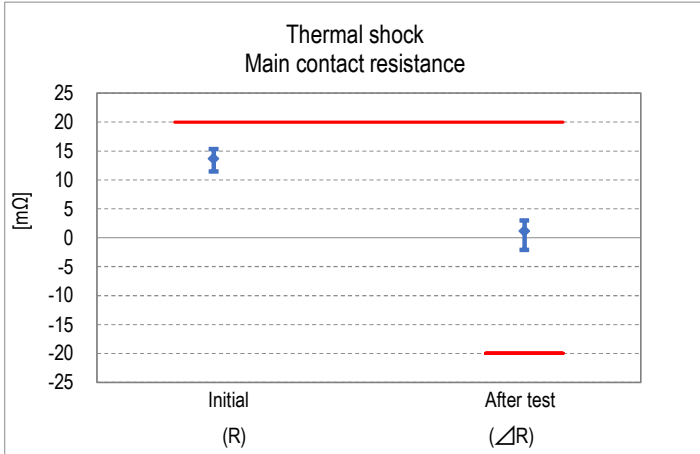
Graph 5



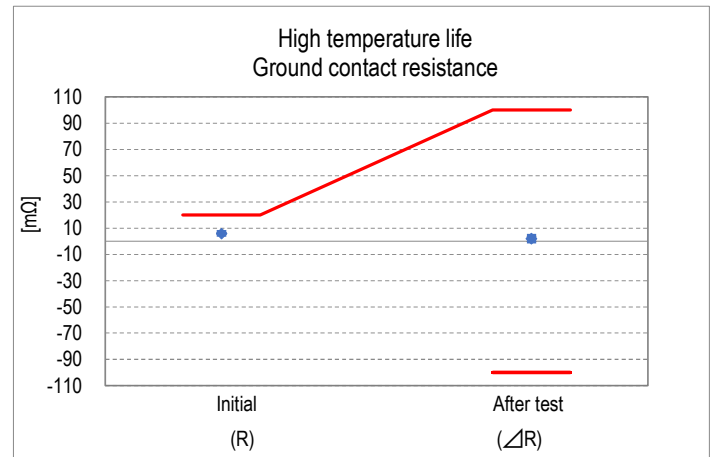
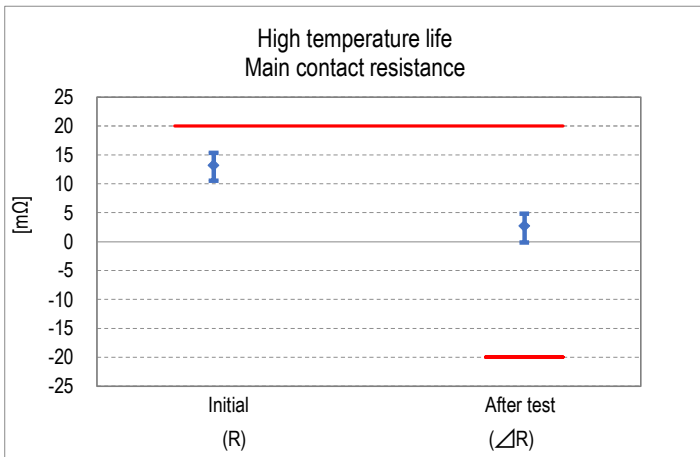
Graph 6



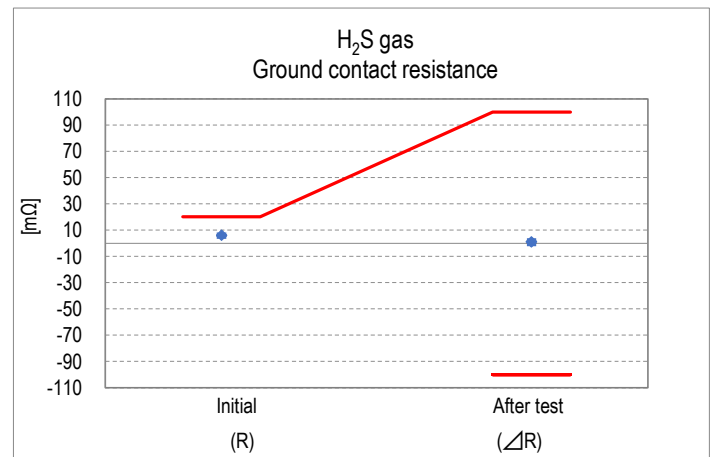
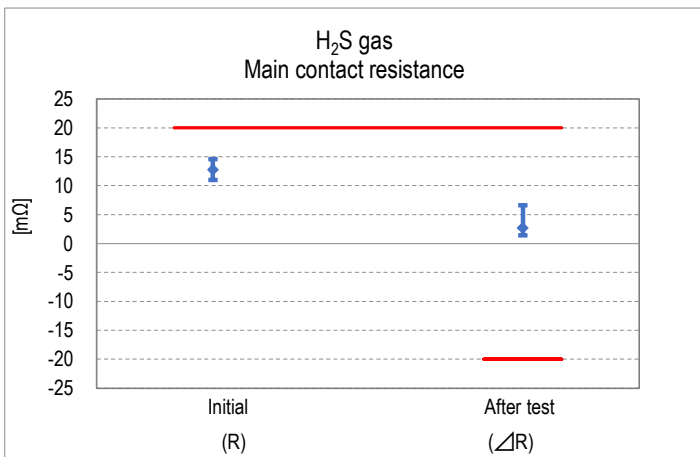
Graph 7



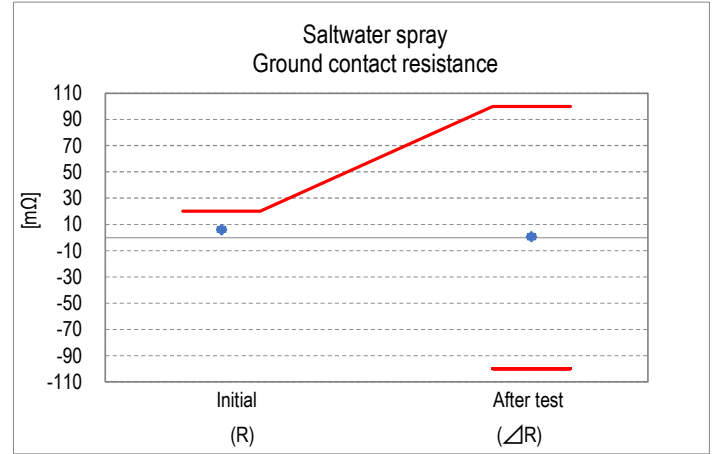
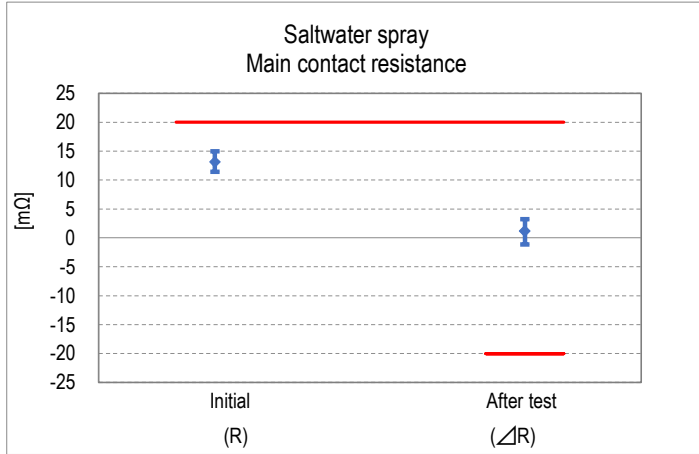
Graph 8



Graph 9



Graph 10



Graph 11