MHF® 5 / 5L Connector(φ1.13 Cable)

Part No. MHF 5L Plug:20668-001R-13, MHF 5 Receptacle:20566-001E-01

Test Report

Product Specification no. PRS-2192

Rev.	ECN	Date	Prepared by	Checked by	Approved by
4	T22102	June 22, 2022	K.Watanabe	K.Yufu	Y.Hashimoto
3	T21107	October 28, 2021	K. Ikeshita		M. Takemoto
2	T19038	July 26, 2019	K. Tanaka	T. Yamauchi	Y.Shimada
1	T17103	June 22, 2017	M. Abe	K. Shinozaki	T. Matsumoto

1. Purpose

To evaluate the performance of MHF 5 / 5L Connector in accordance with PRS-2192.

2. Specimen

(1) MHF 5L PLUG (Part No: 20668-001R-13)
Cable: AWG#32 coaxial cable (Jacket diameter 1.13 mm)
(2) MHF 5 RECEPTACLE (Part No: 20566-001E-01)

3. Test Sequence

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

4. Result

See Table 2, Graph 1 to 11. For the details of the testing conditions and requirements, see PRS-2192.
The “n” in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-2192.

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				
H_2S 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	10	-	-
	Receptacle	5			-									10	10

※Numbers indicate sequence in which tests are performed.

Table 2-1

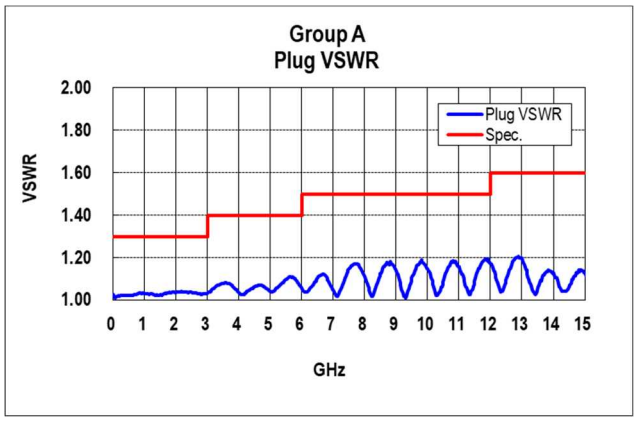
Group	Test items	Measurements	Specification	N	Unit	AVE.	MAX.	MIN.	S	Judgement
A	VSWR									
	Plug									
		0.1~3.0GHz	1.30 MAX.	10	-	1.060	1.08	1.04	0.010	Pass
		3.0~6.0GHz	1.40 MAX.			1.115	1.15	1.10	0.015	Pass
		6.0~9.0 GHz	1.50 MAX.			1.177	1.25	1.14	0.027	Pass
		9.0~12.0 GHz	1.50 MAX.			1.209	1.31	1.17	0.034	Pass
		12.0~15.0 GHz	1.60 MAX.			1.197	1.31	1.12	0.044	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
		6.0~9.0 GHz	1.50 MAX.			1.213	1.23	1.19	0.018	Pass
		9.0~12.0 GHz	1.50 MAX.			1.234	1.26	1.22	0.017	Pass
		12.0~15.0 GHz	1.65 MAX.			1.410	1.45	1.38	0.033	Pass
B	Unmating force									
		Initial	5 N MIN.	10	N	11.15	11.9	10.4	0.32	Pass
		After 30 cycles	3 N MIN.			7.24	7.9	6.2	0.24	Pass
C	Durability									
	Contact resistance of main contact									
		Initial	20mΩ MAX.	10	mΩ	7.30	8.1	6.4	0.59	Pass
		After testing	-			8.21	10.0	6.8	1.04	Pass
		⊿R	⊿R 20mΩ MAX.			0.90	3.0	-0.9	1.29	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	4.84	6.0	3.9	0.68	Pass
		After testing	-			5.05	6.1	4.3	0.58	Pass
		⊿R	⊿R 100mΩ MAX.			0.31	1.8	-1.3	0.87	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									
		After testing	10N MIN.	10	N	19.96	22.1	17.8	1.47	Pass
E	Cable Retention Force									
	Electrical discontinuity									
		Spec: No electrical discontinuity greater than 1μs shall occur.								
		After testing	-	10	-	No discontinity				Pass
	Appearance									
		Spec: No abnormality adversely affecting the performance shall occur								
		After testing	-	10	-	No abnormality				Pass
F	Vibration									
	Contact resistance of main contact									
		Initial	20mΩ MAX.	10	mΩ	6.84	8.0	6.4	0.50	Pass
		After testing	-			6.07	6.6	5.3	0.44	Pass
		⊿R	⊿R 20mΩ MAX.			-0.77	-0.2	-2.7	0.72	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	4.74	5.4	4.4	0.31	Pass
		After testing	-			5.04	5.8	4.2	0.53	Pass
		⊿R	⊿R 100mΩ MAX.			0.30	1.4	-0.4	0.54	Pass
	Electrical discontinuity									
		Spec: No electrical discontinuity grater than 1μs shall occur.								
		After testing	-	10	-	No discontinity				Pass
	Appearance									
		Spec: No abnormality adversely affecting the performance shall occur								
		Initial	No abnormality	10	-	No abnormality				Pass
		After testing				No abnormality				Pass

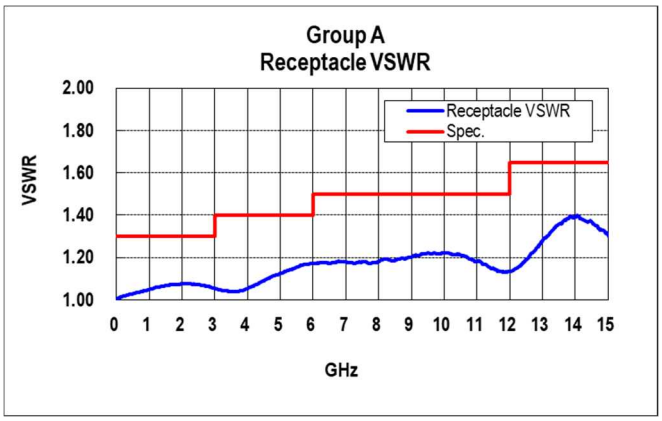
Table 2-2

Group	Test items	Measurements	Specification	N	Unit	AVE.	MAX.	MIN.	S	Judgement
G	Shock									
	Contact resistance of main contact									
		Initial	20mΩ MAX.	10	mΩ	6.73	8.1	5.6	0.76	Pass
		After testing	-			6.71	7.9	5.7	0.67	Pass
		⊿R	⊿R 20mΩ MAX.			-0.02	0.9	-0.6	0.54	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	4.90	5.8	4.1	0.49	Pass
		After testing	-			4.49	5.2	3.8	0.43	Pass
		⊿R	⊿R 100mΩ MAX.			-0.42	-0.1	-0.9	0.26	Pass
	Electrical discontinuity									
		Spec: No electrical discontinuity grater than 1μs shall occur.								
		After testing	-	10	-	No discontinity				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	7.26	8.0	6.5	0.56	Pass
		After testing	-			8.63	10.0	7.2	1.22	Pass
		⊿R	⊿R 20mΩ MAX.			1.37	2.9	-0.6	1.27	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	5.37	7.0	3.8	1.02	Pass
		After testing	-			6.34	7.6	5.6	0.68	Pass
		⊿R	⊿R 100mΩ MAX.			0.97	2.2	-1.2	1.18	Pass
	Insulation residence									
		Initial	500MΩ MIN.	10	MΩ	10,000MΩ MIN.				Pass
		After testing	100MΩ MIN.			10,000MΩ MIN.				Pass
	Dielectric withstanding voltage									
		Spec: No creeping discharge, flashover, no insulator breakdown 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
J	Thermal shock									
	Contact resistance of main contact									
		Initial	20mΩ MAX.	10	mΩ	7.13	8.2	6.5	0.49	Pass
		After testing	-			7.03	7.5	6.3	0.39	Pass
		⊿R	⊿R 20mΩ MAX.			-0.11	0.7	-0.8	0.52	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	5.02	5.7	4.3	0.49	Pass
		After testing	-			5.70	6.4	4.9	0.50	Pass
		⊿R	⊿R 100mΩ MAX.			0.68	1.6	-0.2	0.66	Pass
	Insulation residence									
		Initial	500MΩ MIN.	10	MΩ	10,000MΩ MIN.				Pass
		After testing	100MΩ MIN.			10,000MΩ MIN.				Pass
	Dielectric withstanding voltage									
		Spec: No creeping discharge, flashover, no insulator breakdown 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

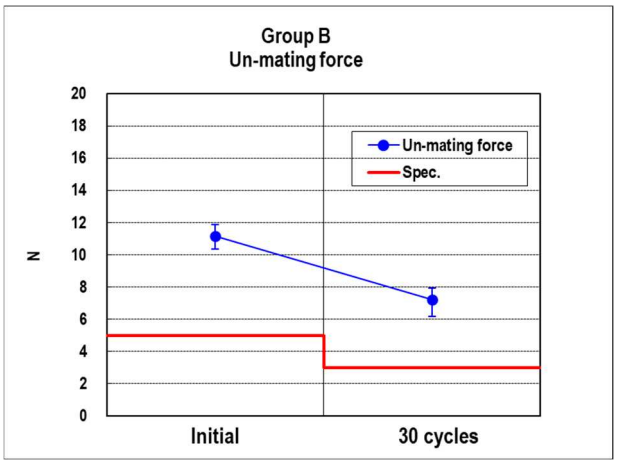
Table 2-3

Group	Test items	Measurements	Specification	N	Unit	AVE.	MAX.	MIN.	S	Judgement
K	High Temperature Life									
	Contact resistance of main contact									
		Initial	20mΩ MAX.	10	mΩ	7.14	7.8	6.7	0.43	Pass
		After testing	-			6.54	7.0	6.0	0.38	Pass
		⊿R	⊿R 20mΩ MAX.			-0.61	0.2	-1.5	0.46	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	4.53	5.1	4.2	0.32	Pass
		After testing	-			4.98	5.4	4.4	0.33	Pass
		⊿R	⊿R 100mΩ MAX.			0.45	0.9	-0.2	0.38	Pass
	Appearance									
		Spec: No abnormality adversely affecting the performance shall occur								
		Initial	No abnormality	10	-	No abnormality				Pass
		After testing				No abnormality				Pass
L	H_2S Gas									
	Contact resistance of main contact									
		Initial	20mΩ MAX.	10	mΩ	6.96	7.4	6.4	0.41	Pass
		After testing	-			8.86	11.6	6.9	1.61	Pass
		⊿R	⊿R 20mΩ MAX.			1.90	4.5	-0.5	1.48	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	4.92	5.9	4.0	0.70	Pass
		After testing	-			6.58	7.2	5.5	0.66	Pass
		⊿R	⊿R 100mΩ MAX.			1.66	2.9	-0.5	1.17	Pass
	Appearance									
		Spec: No abnormality adversely affecting the performance shall occur								
		After testing	No abnormality	10	-	No abnormality				Pass
M	Salt water spray									
	Contact resistance of main contact									
		Initial	20mΩ MAX.	10	mΩ	7.08	7.7	5.5	0.73	Pass
		After testing	-			8.71	11.7	5.8	2.48	Pass
		⊿R	⊿R 20mΩ MAX.			1.64	4.4	-1.8	2.68	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	4.93	5.3	4.6	0.19	Pass
		After testing	-			5.92	6.6	5.0	0.57	Pass
		⊿R	⊿R 100mΩ MAX.			0.99	1.9	0.2	0.54	Pass
	Appearance									
		Spec: No abnormality adversely affecting the performance shall occur								
		After testing	No abnormality	10	-	No abnormality				Pass
N	Solder ability									
		Spec: More than 95% of the dipped surface becomes wet and the pinhole that should not gather at one point is less than 5%								
		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

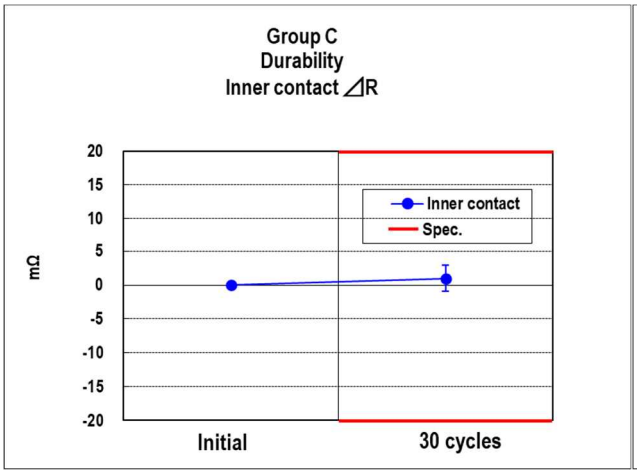


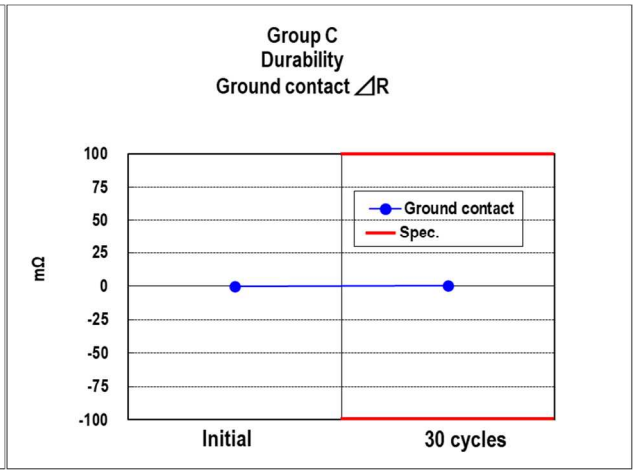


Graph 1 VSWR

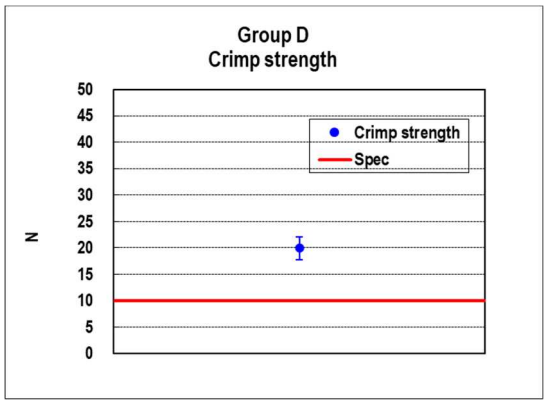


Graph 2 Unmating force

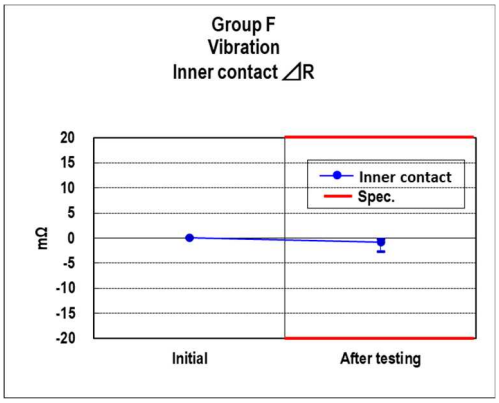


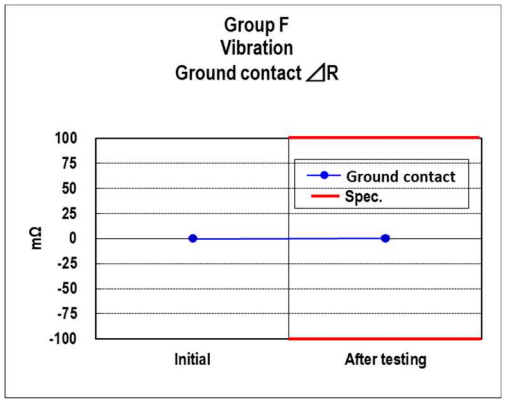


Graph 3 Durability

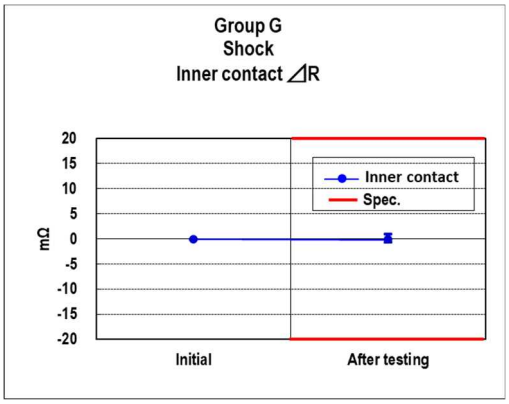


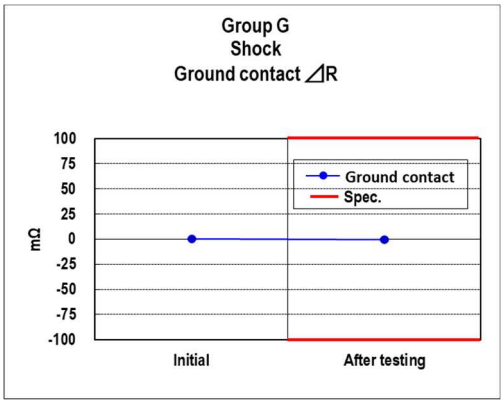
Graph 4 Durability



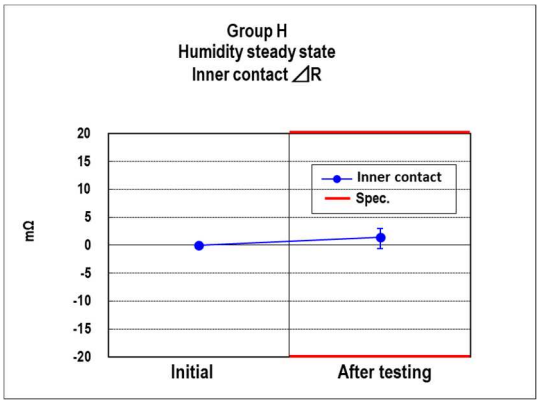


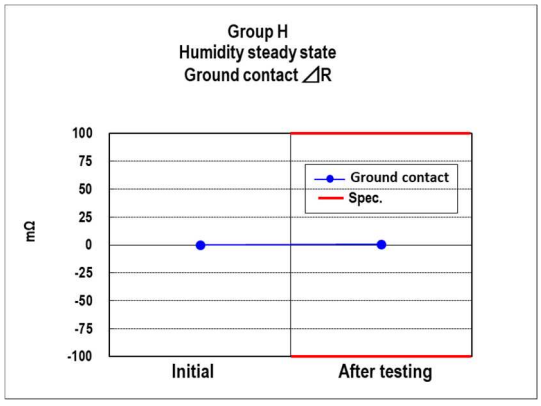
Graph 5 Vibration



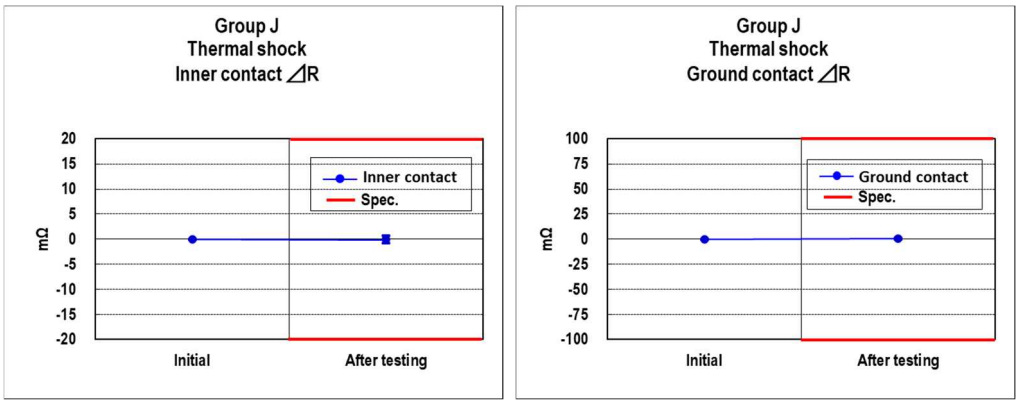


Graph 6 Shock

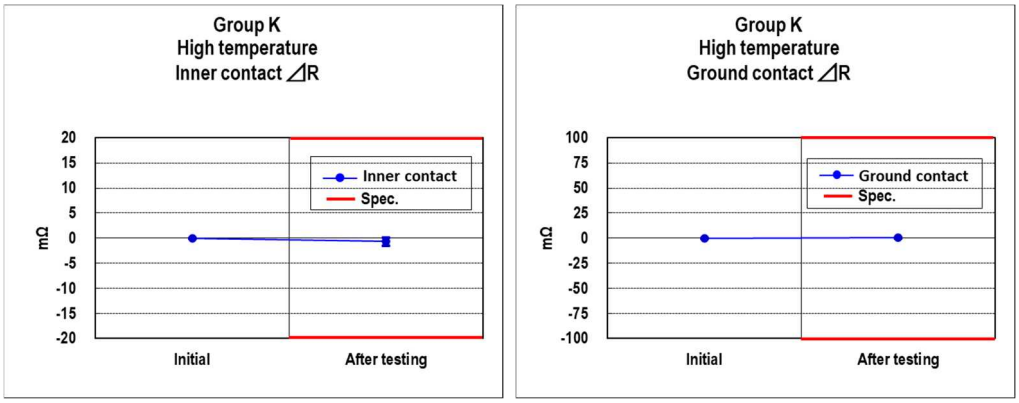




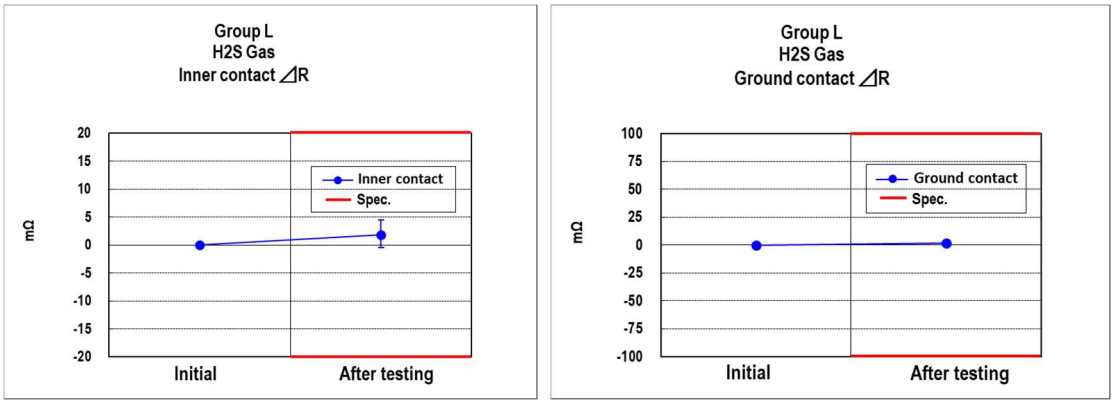
Graph 7 Humidity (Steady State)



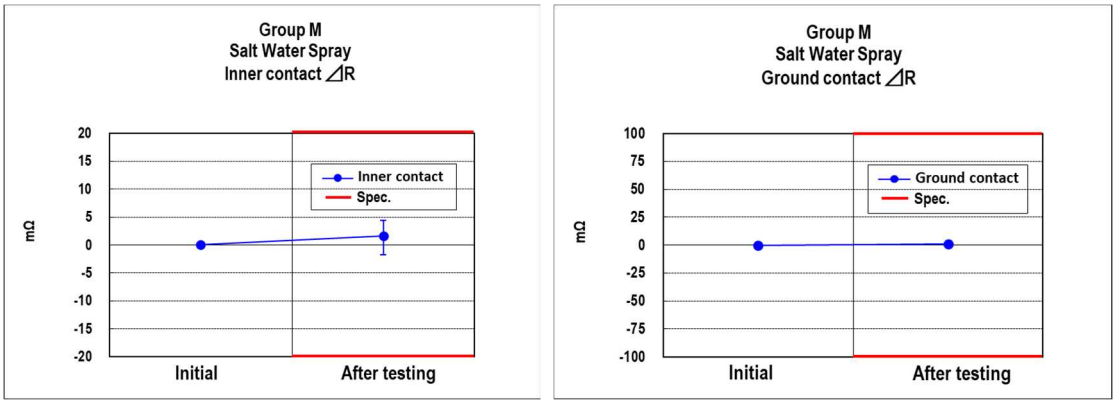
Graph 8 Thermal shock



Graph 9 High Temperature Life



Graph 10 H_2S Gas



Graph 11 Salt water spray