MHF® 5 / 5L Connector (φ0.81 Cable)

Part No. MHF 5L Plug:20714-001R-81, MHF 5 Receptacle:20566-001E-01

Test Report

Product Specification no. PRS-2236

Rev.	ECN	Date	Prepared by	Checked by	Approved by
3	T22103	June 23, 2022	K.Watanabe	K.Yufu	Y.Hashimoto
2	T21108	October 28, 2021	K. Ikeshita		M. Takemoto
1	T19039	March 8, 2019	K. Tanaka	T. Yamauchi	T. Hirakawa
0	T16069	May 10, 2016	R. Hara	Y. Hashimoto	K. Yotsutani

1. Purpose

To evaluate the performance of MHF 5 / 5L Connector in accordance with PRS-2236.

2. Specimen

(1) MHF 5L Plug (Part No: 20714-001R-81)
Cable: AWG#33 coaxial cable (Jacket diameter 0.83 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-2236.
The “n” in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-2236.

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

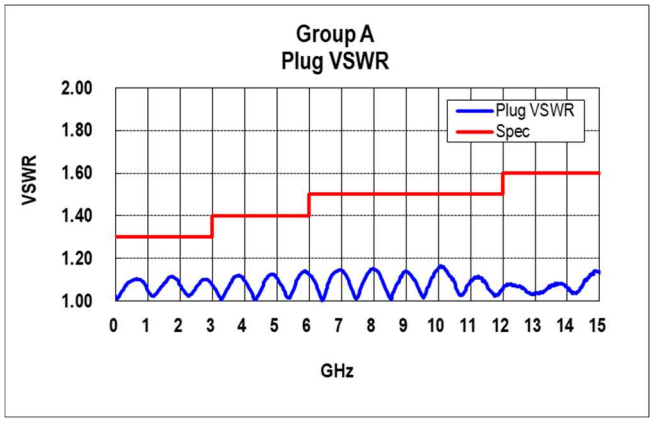
Group	Test items	Measurements	Specification	N	Unit	AVE.	MAX.	MIN.	S	Judgement
A	VSWR									
	Plug									
		0.1~3.0GHz	1.30 MAX.	10	-	1.118	1.13	1.10	0.007	Pass
		3.0~6.0GHz	1.40 MAX.			1.142	1.17	1.12	0.014	Pass
		6.0~9.0 GHz	1.50 MAX.			1.149	1.17	1.12	0.014	Pass
		9.0~12.0 GHz	1.50 MAX.			1.151	1.17	1.12	0.015	Pass
		12.0~15.0 GHz	1.60 MAX.			1.145	1.19	1.11	0.018	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	18.66	19.8	17.2	0.69	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	7.64	8.1	7.0	0.36	Pass
		After testing	-			7.42	7.9	6.8	0.40	Pass
		⊿R	⊿R 20mΩ MAX.			-0.21	0.4	-0.8	0.33	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	4.29	4.7	3.9	0.27	Pass
		After testing	-			4.36	4.8	4.0	0.27	Pass
		⊿R	⊿R 100mΩ MAX.			0.07	0.6	-0.4	0.41	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

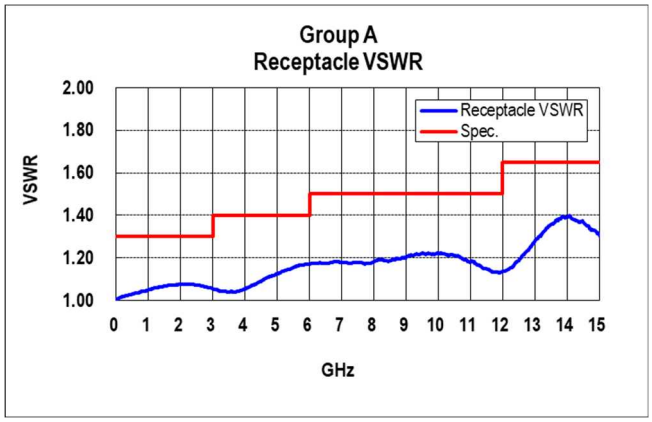
Table 2-2

Group	Test items	Measurements	Specification	N	Unit	AVE.	MAX.	MIN.	S	Judgement
G	Shock									
	Contact resistance of main contact									
		Initial	20mΩ MAX.	10	mΩ	7.30	7.7	7.0	0.27	Pass
		After testing	-			7.01	7.7	6.5	0.37	Pass
		⊿R	⊿R 20mΩ MAX.			-0.30	0.2	-1.0	0.38	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	3.81	4.1	3.5	0.19	Pass
		After testing	-			4.00	4.4	3.5	0.29	Pass
		⊿R	⊿R 100mΩ MAX.			0.19	0.6	-0.6	0.31	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	7.50	8.2	7.0	0.43	Pass
		After testing	-			7.46	9.1	6.6	0.70	Pass
		⊿R	⊿R 20mΩ MAX.			-0.04	1.0	-0.7	0.47	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	4.14	4.6	3.8	0.23	Pass
		After testing	-			5.17	6.5	4.6	0.52	Pass
		⊿R	⊿R 100mΩ MAX.			1.03	2.0	0.5	0.46	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	7.73	8.4	7.0	0.42	Pass
		After testing	-			7.39	8.0	7.0	0.33	Pass
		⊿R	⊿R 20mΩ MAX.			-0.34	0.2	-0.8	0.31	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	4.28	4.9	3.9	0.30	Pass
		After testing	-			6.12	7.2	5.1	0.73	Pass
		⊿R	⊿R 100mΩ MAX.			1.84	3.0	0.2	0.90	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

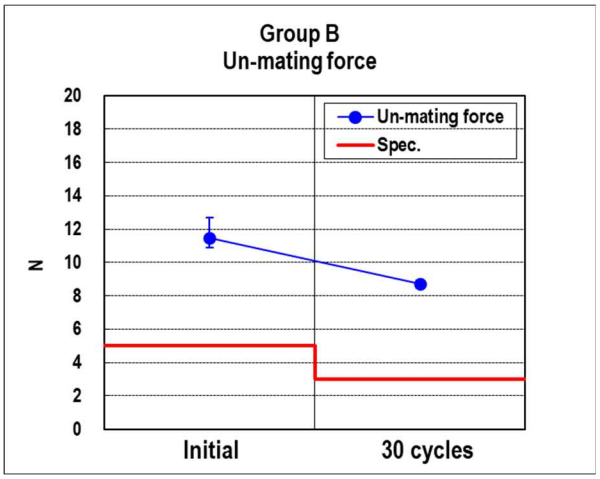
Table 2-3

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	7.74	8.2	7.3	0.31	Pass
		After testing	-			7.02	7.6	6.4	0.43	Pass
		⊿R	⊿R 20mΩ MAX.			-0.73	0.0	-1.3	0.46	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	4.25	4.6	3.9	0.23	Pass
		After testing	-			4.34	4.8	4.0	0.23	Pass
		⊿R	⊿R 100mΩ MAX.			0.09	0.7	-0.4	0.34	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	7.71	8.7	6.4	0.66	Pass
		After testing	-			7.05	8.2	6.3	0.64	Pass
		⊿R	⊿R 20mΩ MAX.			-0.65	0.3	-1.2	0.47	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	4.08	5.0	3.1	0.47	Pass
		After testing	-			4.86	5.3	4.2	0.37	Pass
		⊿R	⊿R 100mΩ MAX.			0.78	1.4	0.0	0.42	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	7.51	8.0	6.8	0.37	Pass
		After testing	-			7.46	8.5	6.7	0.61	Pass
		⊿R	⊿R 20mΩ MAX.			-0.05	1.2	-1.1	0.75	Pass
	Contact resistance of ground contact									
		Initial	20mΩ MAX.	10	mΩ	4.15	4.5	3.6	0.25	Pass
		After testing	-			5.41	6.2	4.6	0.45	Pass
		⊿R	⊿R 100mΩ MAX.			1.26	2.0	0.6	0.45	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

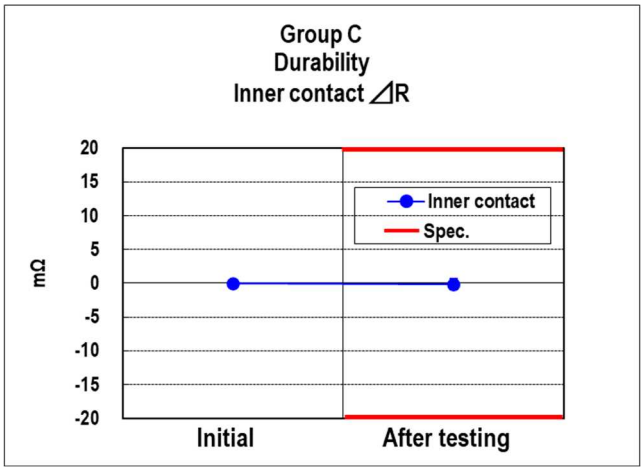


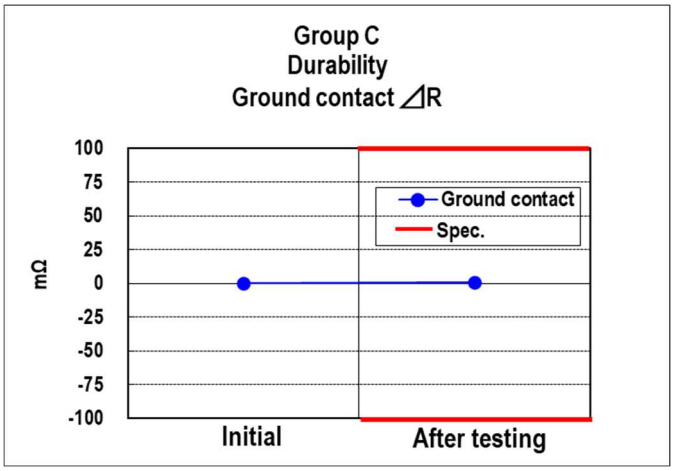


Graph 1 VSWR

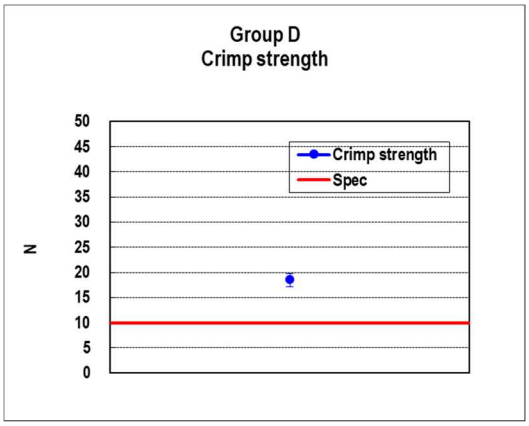


Graph 2 Unmating force

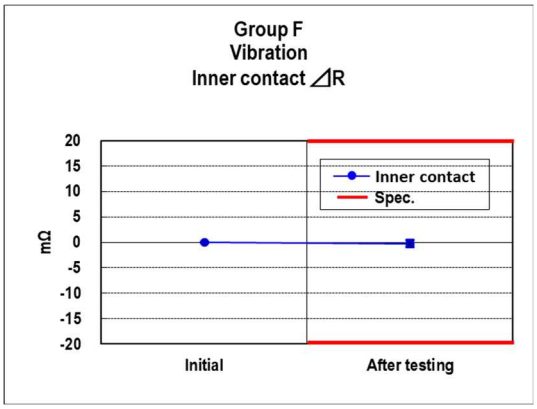


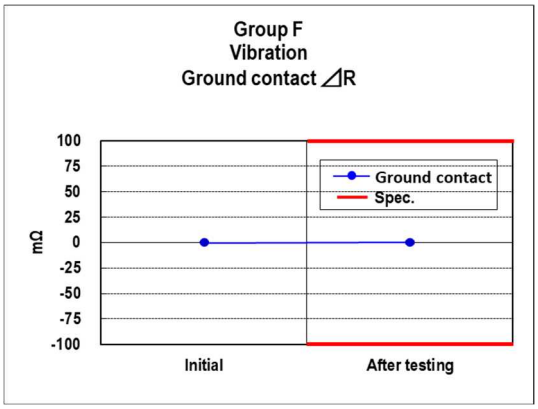


Graph 3 Durability

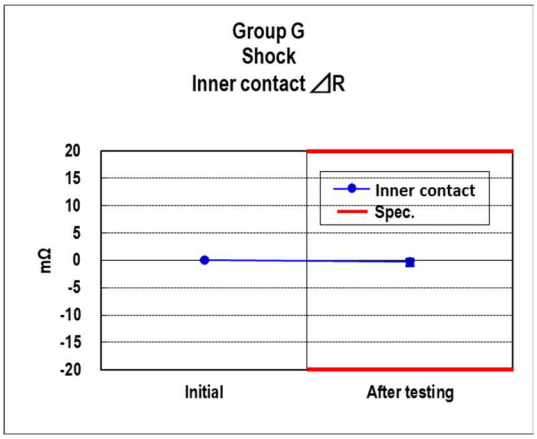


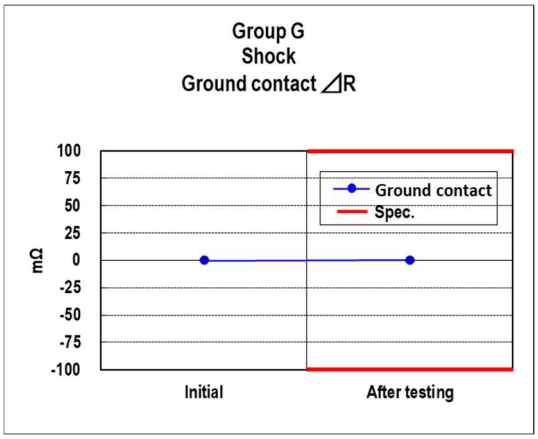
Graph 4 Durability



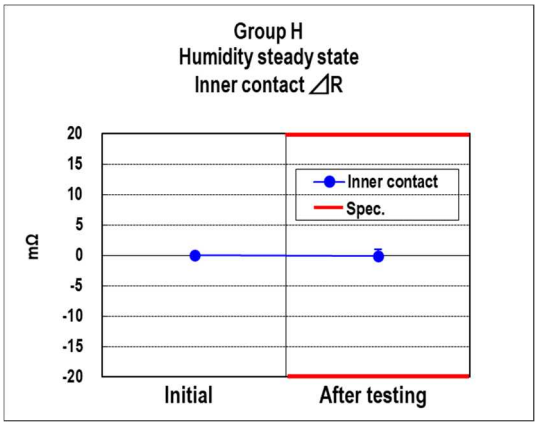


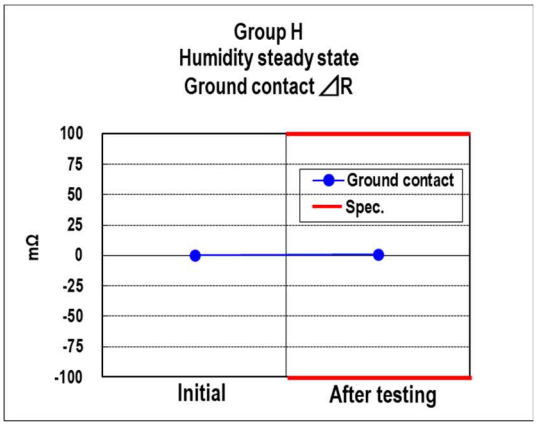
Graph 5 Vibration



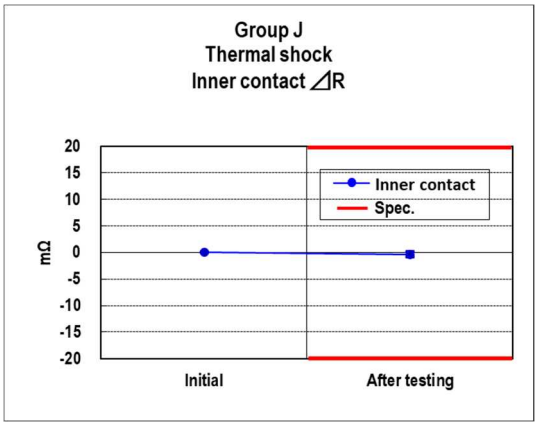


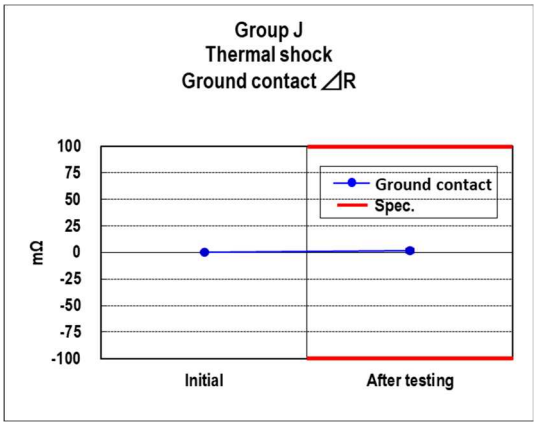
Graph 6 Shock



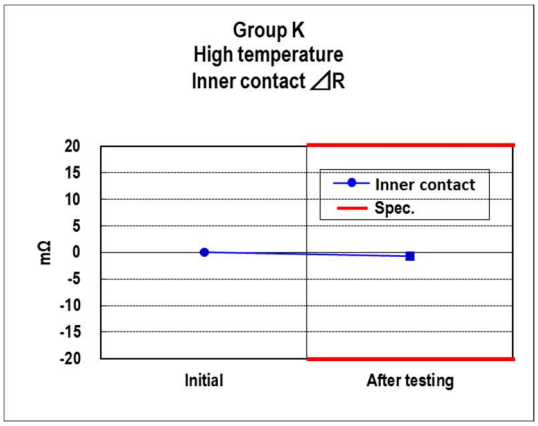


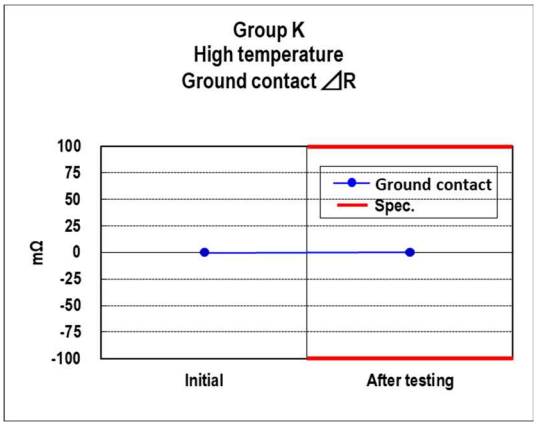
Graph 7 Humidity (Steady State)



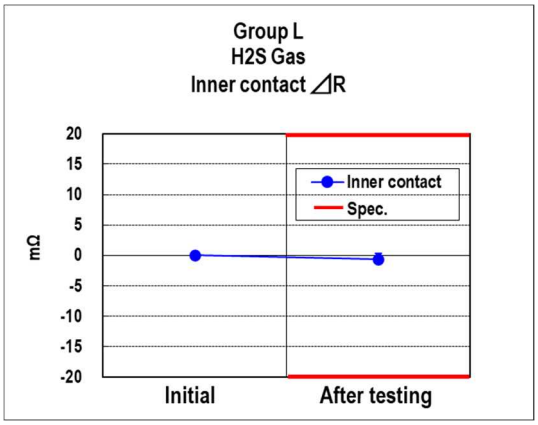


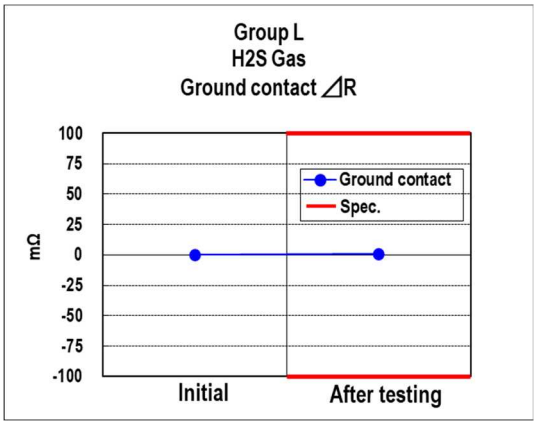
Graph 8 Thermal shock



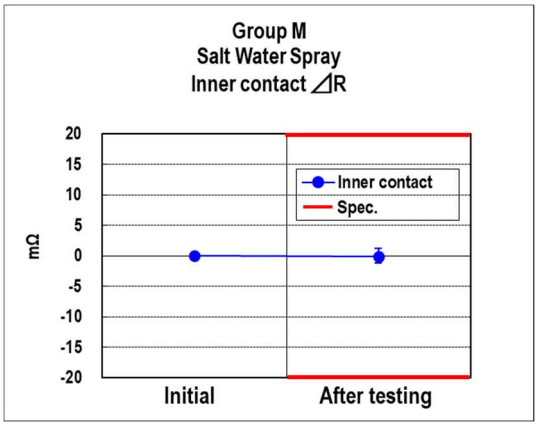


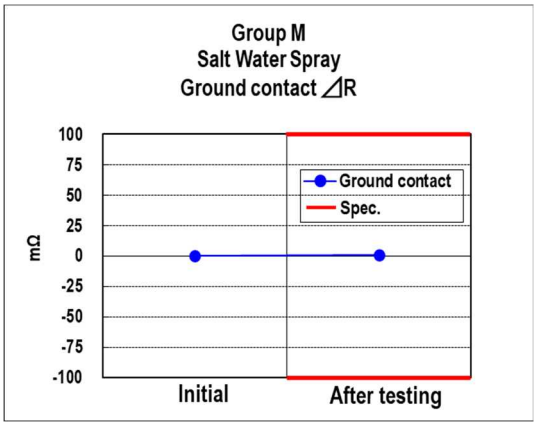
Graph 9 High Temperature Life





Graph 10 H_2S Gas





Graph 11 Salt water spray