

MHF[®] 5L Connector (φ0.81 Cable)

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

Test Report

Product Specification no. PRS-2236

2	T21108	October 28, 2021	K. Ikeshita		M. Takemoto
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0	T16069	May 10, 2016	R. Hara	Y. Hashimoto	K. Yotsutani
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of MHF 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 0.81 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 ₂ S 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 sequence in which tests are performed.

Table 2-1

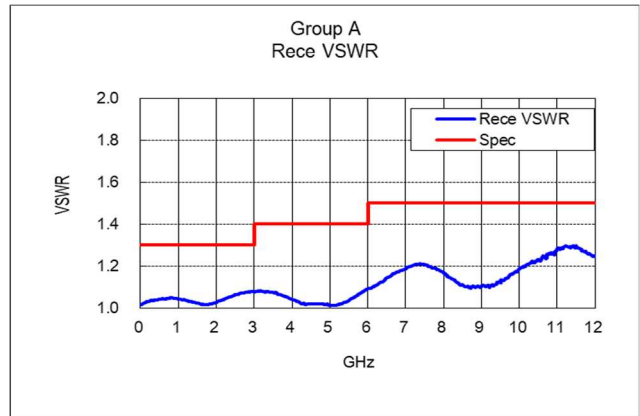
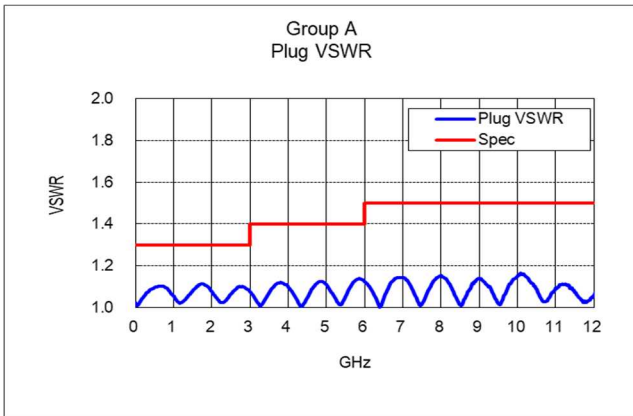
Group	Test items	Measurements	Specification	N	Unit	AVE.	MAX.	MIN.	S	Judgement
A	VSWR									
	Plug									
		0.1~3.0GHz	1.3 MAX.	10	-	1.118	1.13	1.10	0.007	Pass
		3.0~6.0GHz	1.4 MAX.			1.142	1.17	1.12	0.014	Pass
		6.0~12.0 GHz	1.5 MAX.			1.151	1.17	1.12	0.015	Pass
	Receptacle									
	0.1~3.0GHz	1.3 MAX.	10	-	1.054	1.08	1.03	0.024	Pass	
	3.0~6.0GHz	1.4 MAX.			1.087	1.11	1.07	0.017	Pass	
	6.0~12.0 GHz	1.5 MAX.			1.298	1.33	1.27	0.025	Pass	
B	Unmating force									
		Initial	4 N MIN.	10	N	11.15	11.9	10.4	0.32	Pass
		After 30 cycles	2 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
		ΔR	ΔR 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
		ΔR	ΔR 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 discontinuity				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
		ΔR	ΔR 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
		ΔR	ΔR 100mΩ MAX.			0.07	0.6	-0.4	0.41	Pass
	Electrical discontinuity									
		Spec: No electrical discontinuity greater than 1μs shall occur.								
		After testing	-	10	-	No discontinuity				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

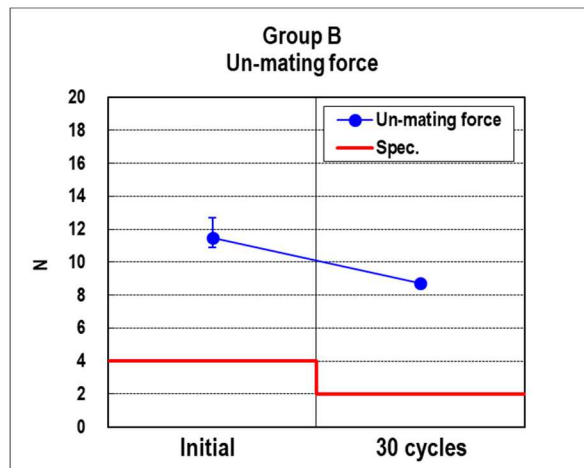
Group	Test items	Measurements	Specification	N	Unit	AVE.	MAX.	MIN.	S	Judgement	
G	Shock										
	Contact resistance of main contact										
		Initial	20mΩ MAX.	10	mΩ	7.30	7.7	7.0	0.27	Pass	
		After testing	-			7.01	7.7	6.5	0.37	Pass	
		ΔR	ΔR 20mΩ MAX.			-0.30	0.2	-1.0	0.38	Pass	
	Contact resistance 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	
		ΔR	ΔR 100mΩ MAX.			0.19	0.6	-0.6	0.31	Pass	
	Electrical discontinuity										
		Spec: No electrical discontinuity greater than 1μs shall occur.									
		After testing	-	10	-	No discontinuity				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	
		ΔR	ΔR 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	
		ΔR	ΔR 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	
		ΔR	ΔR 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	
		ΔR	ΔR 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

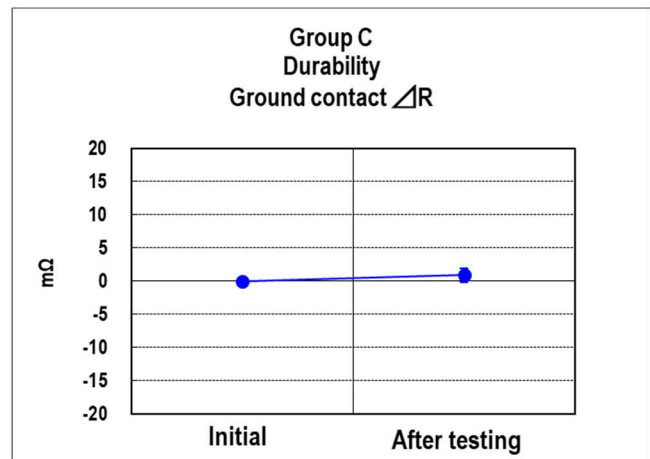
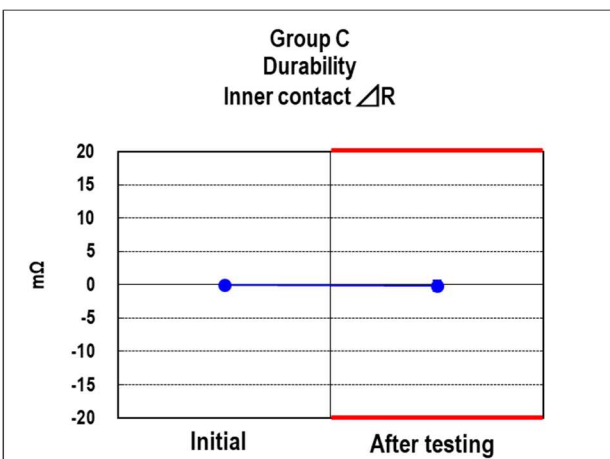
Group	Test items	Measurements	Specification	N	Unit	AVE.	MAX.	MIN.	S	Judgement
K	High Temperature Life									
	Contact resistance of main contact									
		Initial	20mΩ MAX.	10	mΩ	7.74	8.2	7.3	0.31	Pass
		After testing	-			7.02	7.6	6.4	0.43	Pass
		ΔR	ΔR 20mΩ MAX.			-0.73	0.0	-1.3	0.46	Pass
	Contact 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
		ΔR	ΔR 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 ₂ S 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
		ΔR	ΔR 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
		ΔR	ΔR 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
		ΔR	ΔR 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
		ΔR	ΔR 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	



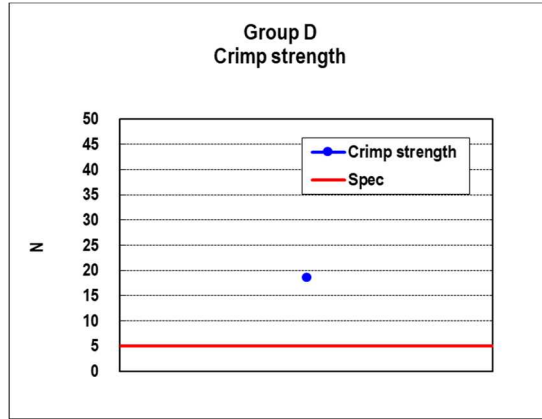
Graph 1 VSWR



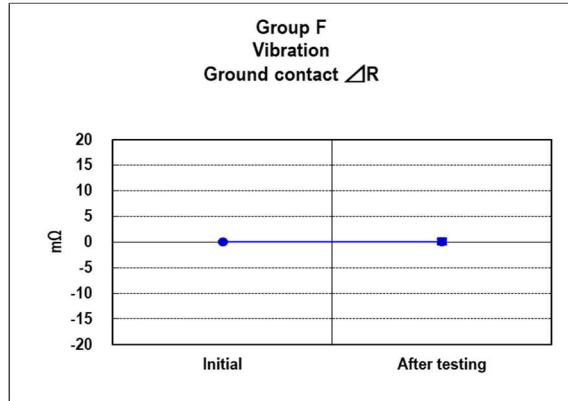
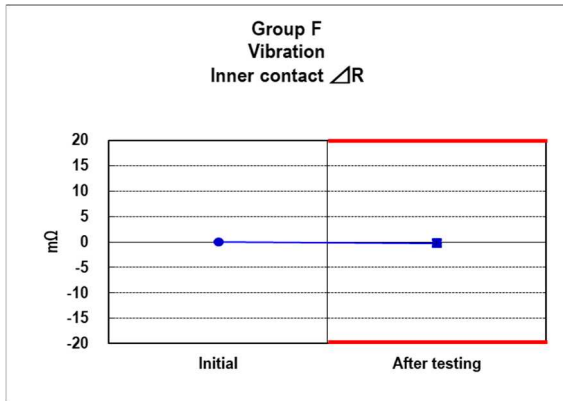
Graph 2 Unmating force



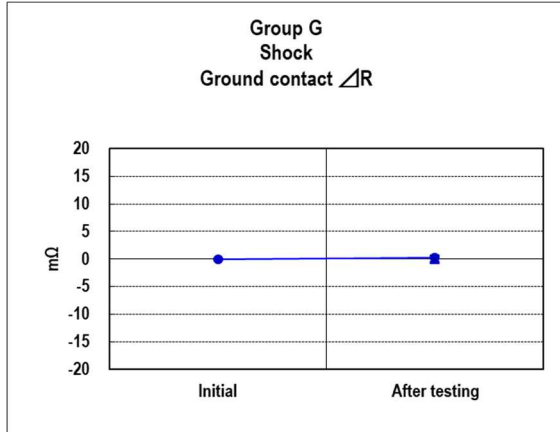
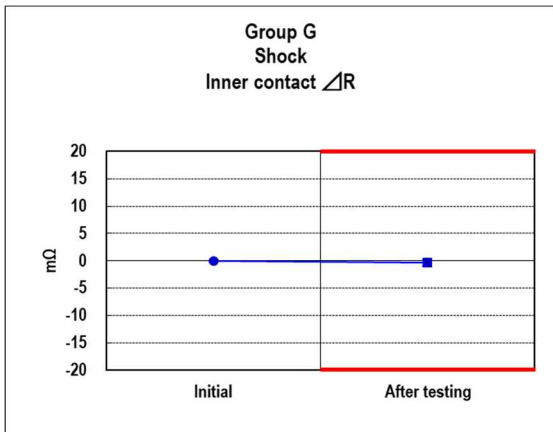
Graph 3 Durability



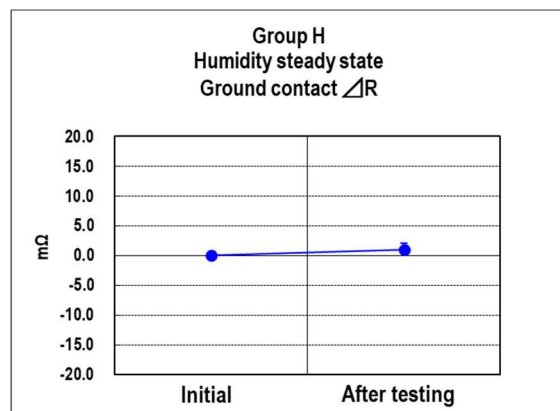
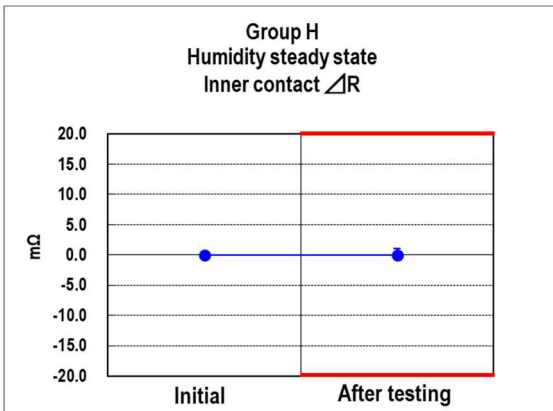
Graph 4 Durability



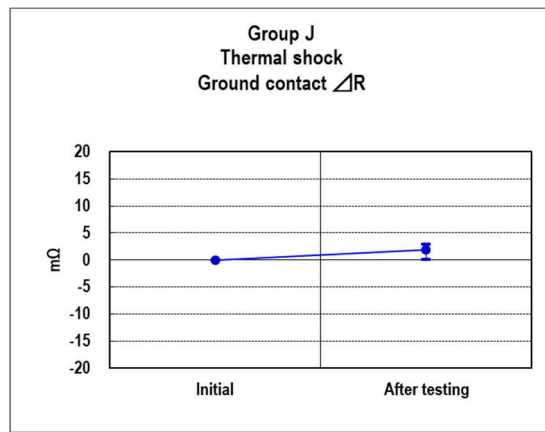
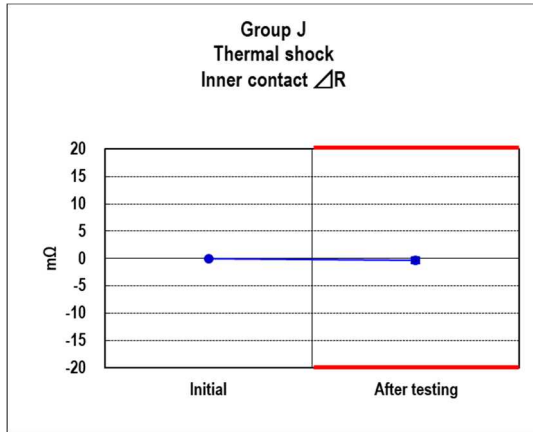
Graph 5 Vibration



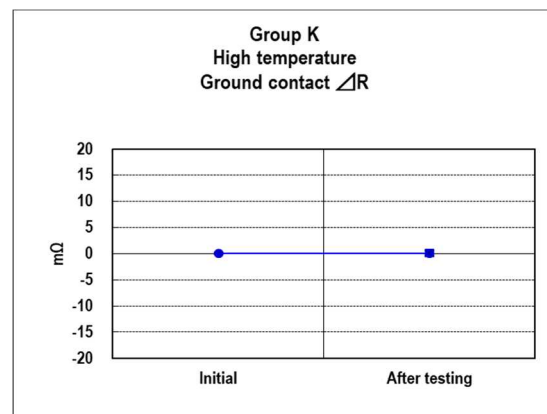
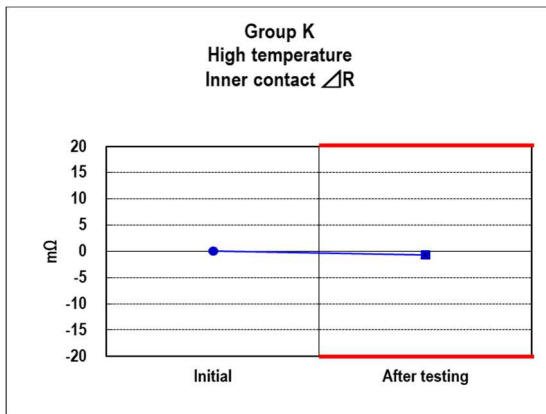
Graph 6 Shock



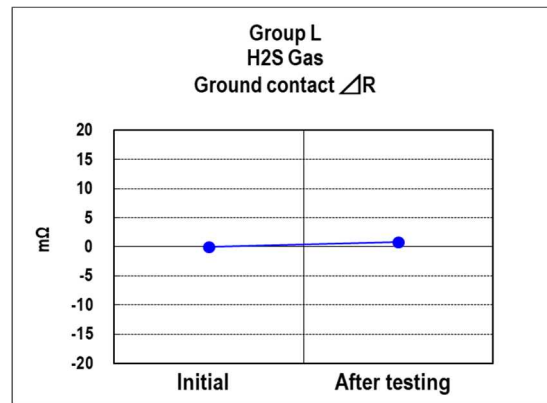
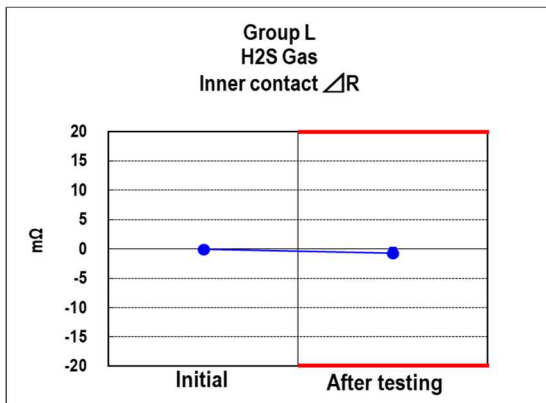
Graph 7 Humidity (Steady State)



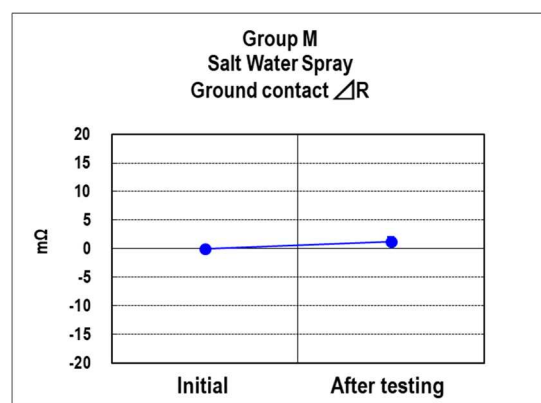
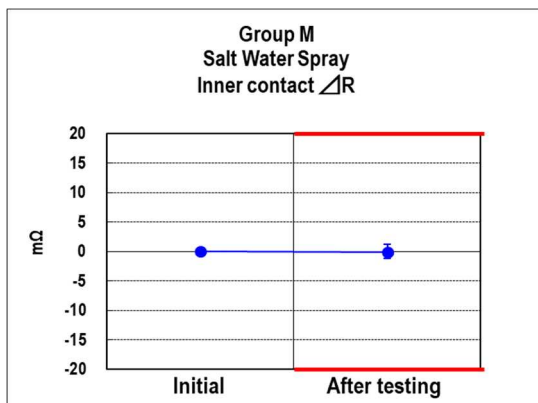
Graph 8 Thermal shock



Graph 9 High Temperature Life



Graph 10 H₂S Gas



Graph 11 Salt water spray