MHF® 4 Connector

Part No. Plug: 20611-001R Receptacle: 20449-001E-**

Test Report

Product Specification no. PRS-2530

Rev.	ECN	Date	Prepared by	Checked by	Approved by
3	T21110	October 29, 2021	K. Ikeshita		M. Takemoto
2	T19170	December 13, 2019	S.Kamada	S.Suzuki	Y.Shimada
1	T19022	April 4, 2019	S.Kamada		T.Hirakawa
0	T19017	February 7, 2019	H.Takahashi	T.Yamauchi	T.Hirakawa

1. Purpose

To evaluate the performance of MHF 4 connector in accordance with PRS-2530.

2. Specimen

(1) Plug: 20611-001R
(2) Receptacle: 20449-001E-**

3. Test Sequence

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

4. Result

See Table 2, and from sheet 7. For the details of the testing conditions and requirements, see PRS-2530.
The “n” in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-2530.

Table 1 Test Sequence and Sample Quantity

Test Item	Group														
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
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	1								3, 7	3, 7					
VSWR		1													
Unmating Force			1												
Crimp strength				1											
Durability					2										
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
Sample Quantity (pcs.)	10	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 Test Result

Group	Test items / Measurements	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement
A	Dielectric withstanding voltage								
	Spec : No creeping discharge,flashover,nor insulator breakdown shall occur.								
	After testing	No abnormality	10	-	No abnormality				Pass
B	VSWR								
	Plug								
	0.1～3.0GHz	1.3 MAX.	10	-	1.239	1.25	1.22	0.013	Pass
	3.0～6.0GHz	1.5 MAX.		-	1.377	1.38	1.37	0.009	Pass
	Receptacle								
	0.1～3.0GHz	1.3 MAX.	10	-	1.138	1.14	1.14	0.002	Pass
	3.0～6.0GHz	1.4 MAX.		-	1.123	1.14	1.11	0.017	Pass
C	Unmating force								
	Initial	4N MIN.	10	N	13.11	13.8	12.6	0.44	Pass
	After testing	2N MIN.			8.48	9.3	7.7	0.59	Pass
D	Crimp strength								
	After testing	5N MIN.	10	N	7.04	7.60	6.35	0.37	Pass
E	Durability								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	8.56	9.1	7.8	0.39	Pass
	After testing	-			8.67	10.3	7.2	0.80	-
	⊿R	⊿20mΩ MAX.			0.11	1.6	-1.5	0.95	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	5.86	6.9	5.2	0.50	Pass
	After testing	-			7.31	9.8	6.0	1.06	-
	⊿R	⊿100mΩ MAX.			0.93	2.9	-2.6	1.42	Pass
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-	No abnormality				Pass
	After testing				No abnormality				Pass
F	Cable retention force								
	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 Test Result

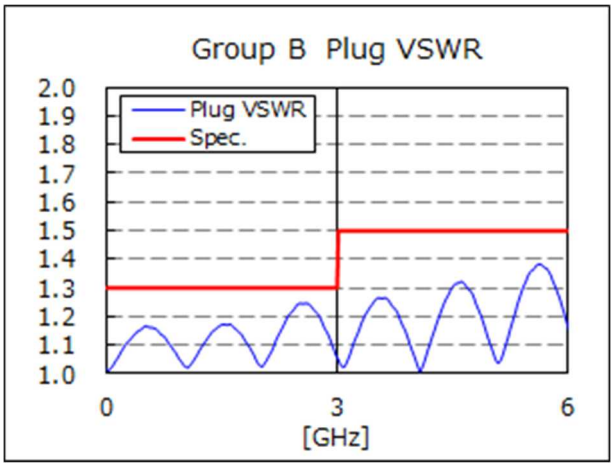
Group	Test items / Measurements	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement
G	Vibration								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	7.73	8.7	6.4	0.76	Pass
	After testing	-			7.68	8.7	6.1	0.85	-
	⊿R	⊿20mΩ MAX.			-0.05	0.7	-0.6	0.50	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	5.39	5.8	4.8	0.32	Pass
	After testing	-			5.29	5.9	4.5	0.46	-
	⊿R	⊿100mΩ MAX.			-0.10	0.8	-1.1	0.56	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	Shock								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	8.06	9.1	7.5	0.57	Pass
	After testing	-			8.59	11.1	7.5	1.02	-
	⊿R	⊿20mΩ MAX.			0.53	2.0	-0.2	0.74	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	5.08	5.6	4.6	0.29	Pass
	After testing	-			5.40	5.7	4.9	0.25	-
	⊿R	⊿100mΩ MAX.			0.32	0.7	0.0	0.22	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
J	Humidity(Steady State)								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	8.69	10.5	7.1	0.82	Pass
	After testing	-			9.89	10.7	8.7	0.75	-
	⊿R	⊿20mΩ MAX.			1.21	2.0	-0.3	0.75	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	6.40	6.9	5.3	0.50	Pass
	After testing	-			6.51	7.0	5.4	0.56	-
	⊿R	⊿100mΩ MAX.			0.11	1.2	-1.4	0.68	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

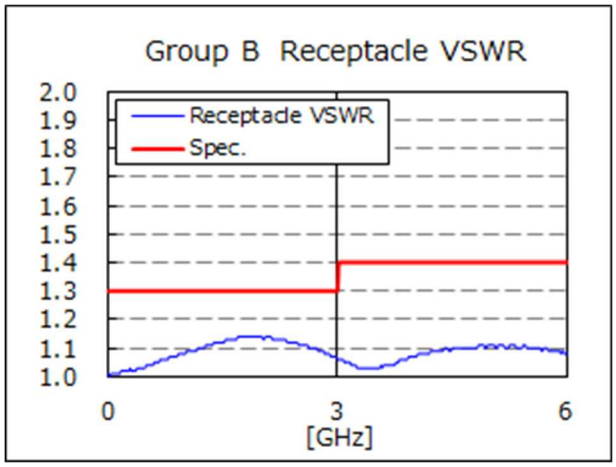
Table 2-3 Test Result

Group	Test items / Measurements	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement
K	Thermal shock								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	6.99	9.4	5.1	1.19	Pass
	After testing	-			7.41	9.6	4.4	1.69	-
	⊿R	⊿20mΩ MAX.			0.42	2.7	-5.0	2.05	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	5.88	7.7	2.9	1.22	Pass
	After testing	-			8.34	11.5	6.5	1.68	-
	⊿R	⊿100mΩ MAX.			2.46	5.5	1.1	1.38	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
L	High temperature life								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	6.08	7.2	5.2	0.60	Pass
	After testing	-			7.16	7.7	6.0	0.62	-
	⊿R	⊿20mΩ MAX.			1.08	1.9	0.5	0.43	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	5.24	6.8	4.3	0.93	Pass
	After testing	-			11.03	24.9	5.8	5.66	-
	⊿R	⊿100mΩ MAX.			5.79	18.3	-0.4	5.56	Pass
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-	No abnormality				Pass
	After testing				No abnormality				Pass
M	H2S gas								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	7.74	8.7	6.9	0.51	Pass
	After testing	-			10.88	18.4	8.5	2.82	-
	⊿R	⊿20mΩ MAX.			3.14	10.6	0.9	2.79	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	5.61	6.6	5.0	0.44	Pass
	After testing	-			8.40	9.7	7.0	0.95	-
	⊿R	⊿100mΩ MAX.			2.79	4.2	1.4	0.75	Pass
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-	No abnormality				Pass
	After testing				No abnormality				Pass

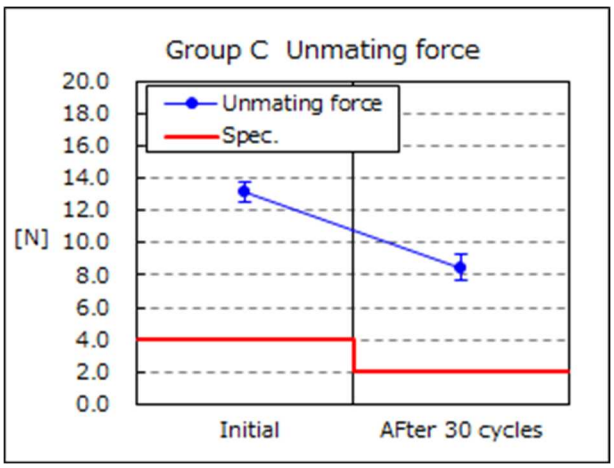
Table 2-4 Test Result

Group	Test items / Measurements	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement
N	Saltwater spray								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	8.15	9.4	6.4	0.92	Pass
	After testing	-			9.42	10.9	7.2	1.11	-
	⊿R	⊿20mΩ MAX.			1.27	2.6	0.3	0.67	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	5.66	6.1	5.1	0.37	Pass
	After testing	-			8.09	8.9	7.0	0.60	-
	⊿R	⊿100mΩ MAX.			2.44	3.2	1.2	0.72	Pass
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-	No abnormality				Pass
	After testing				No abnormality				Pass
P	Solder ability								
	Spec: More than 95% of the dipped surface shall be evenly wet.								
	After testing	-	10	-	No abnormality				Pass
Q	Reflow soldering heat resistance								
	Appearance								
	Spec: No abnormality adversely affecting the performance shall occur.								
	After testing	-	10	-	No abnormality				Pass

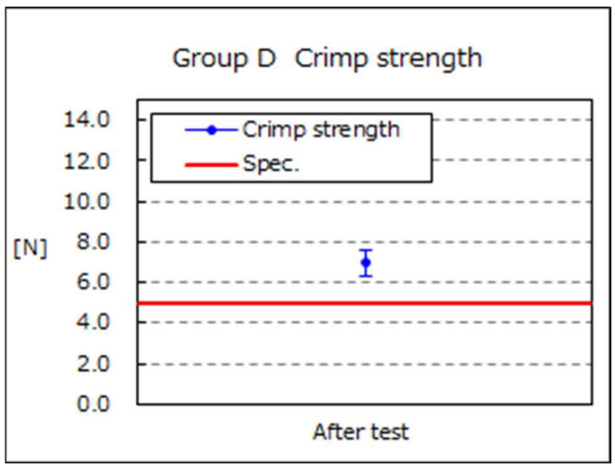




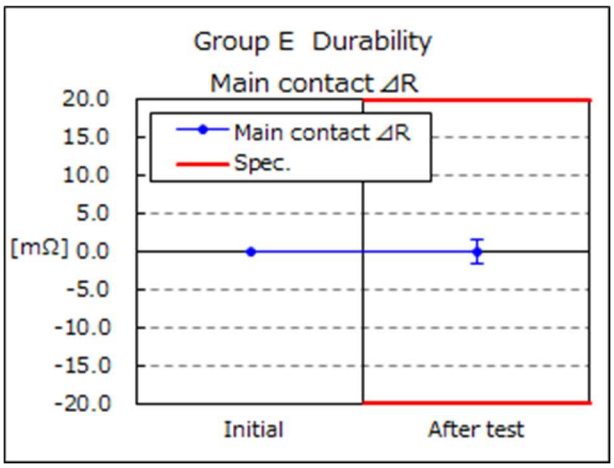
Graph 1 Group B VSWR

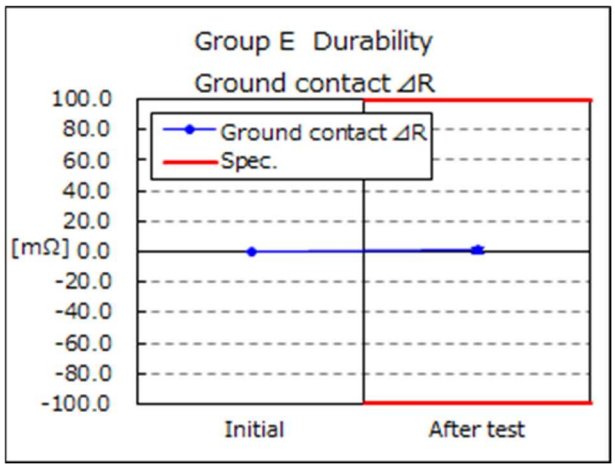


Graph 2 Group C Unmating force

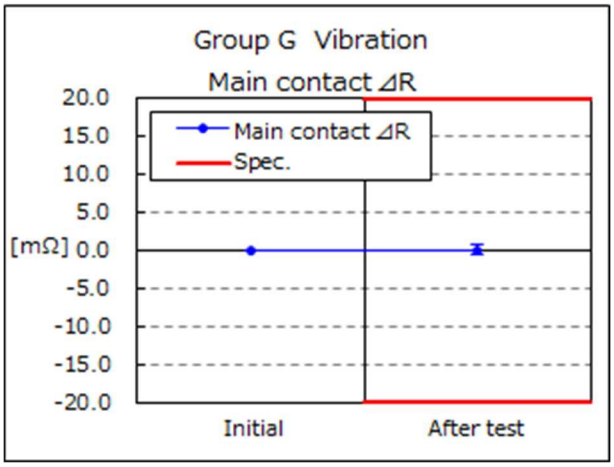


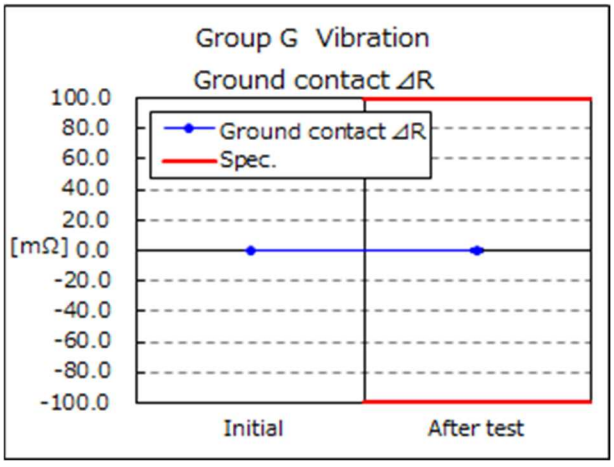
Graph 3 Group D Crimp strength



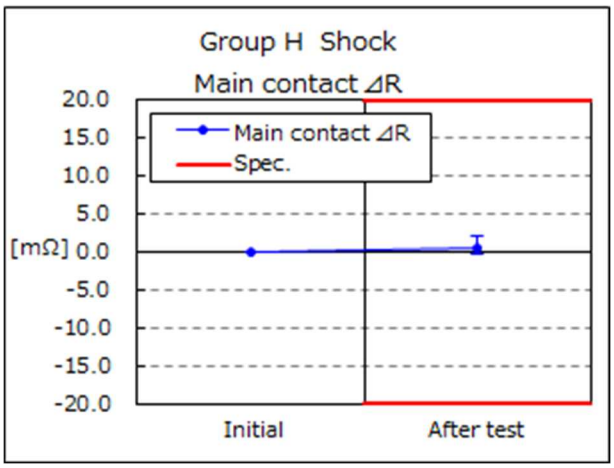


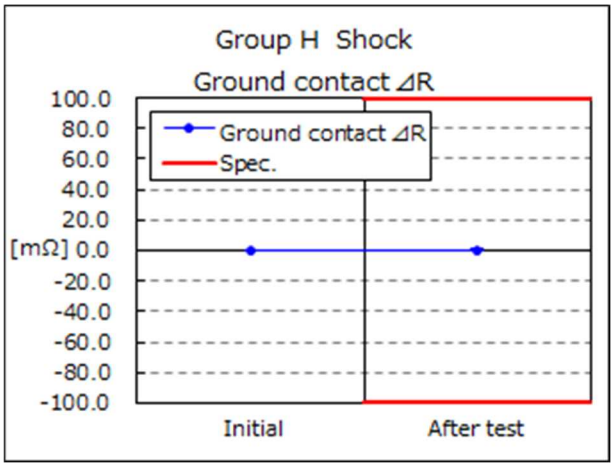
Graph 4 Group E Durability



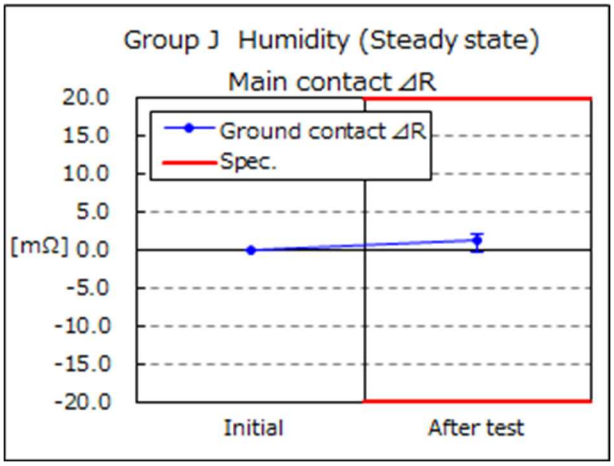


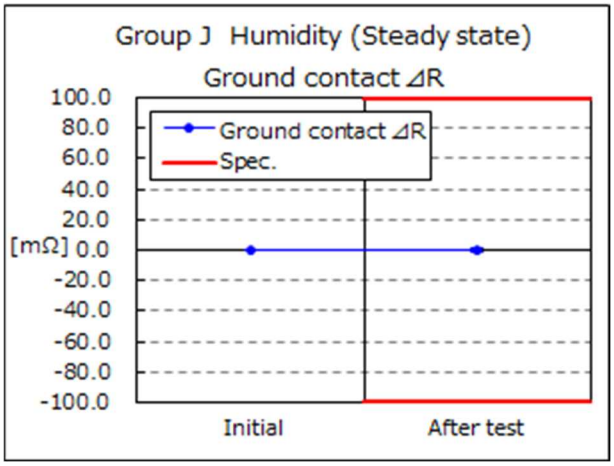
Graph 5 Group G Vibration



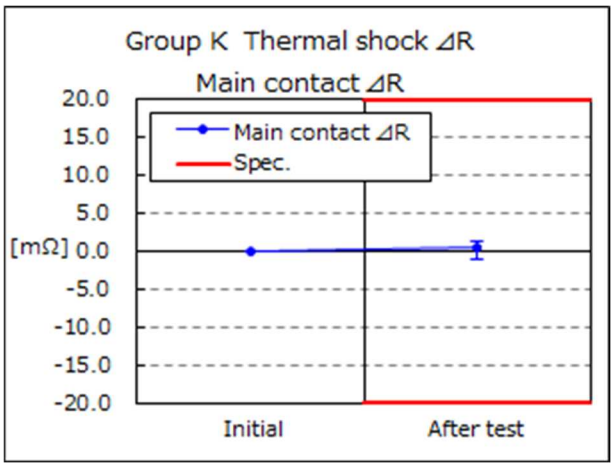


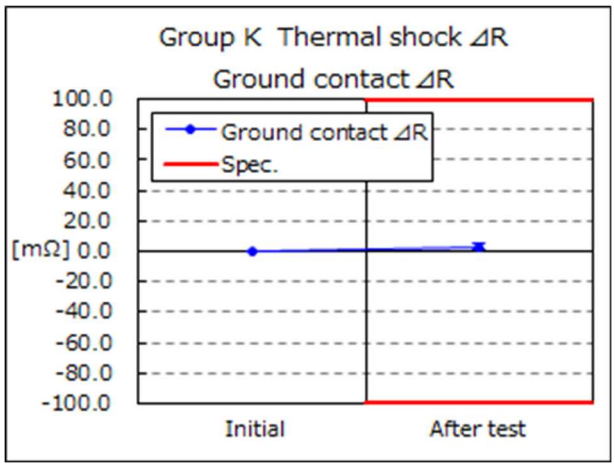
Graph 6 Group H Shock



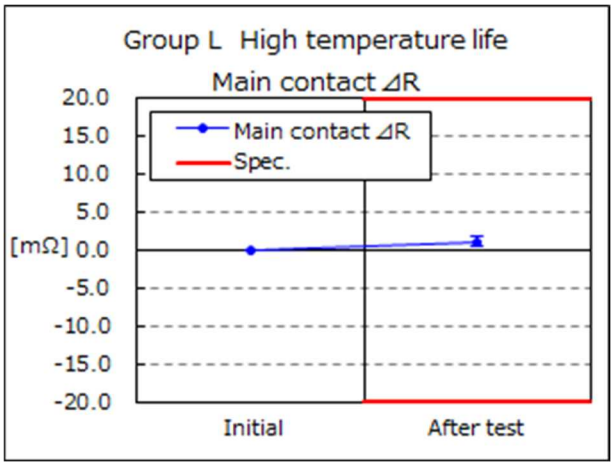


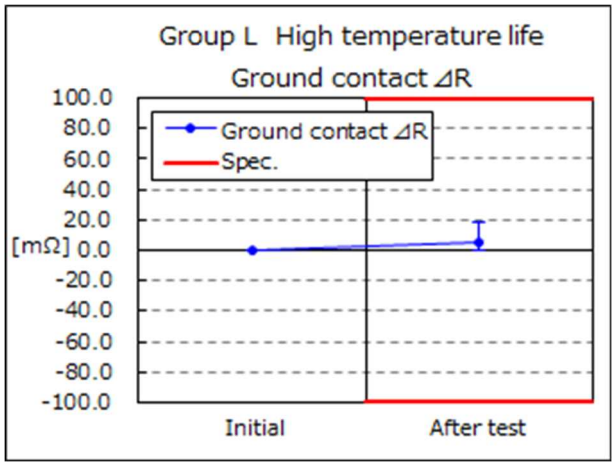
Graph 7 Group J Humidity (Steady state)



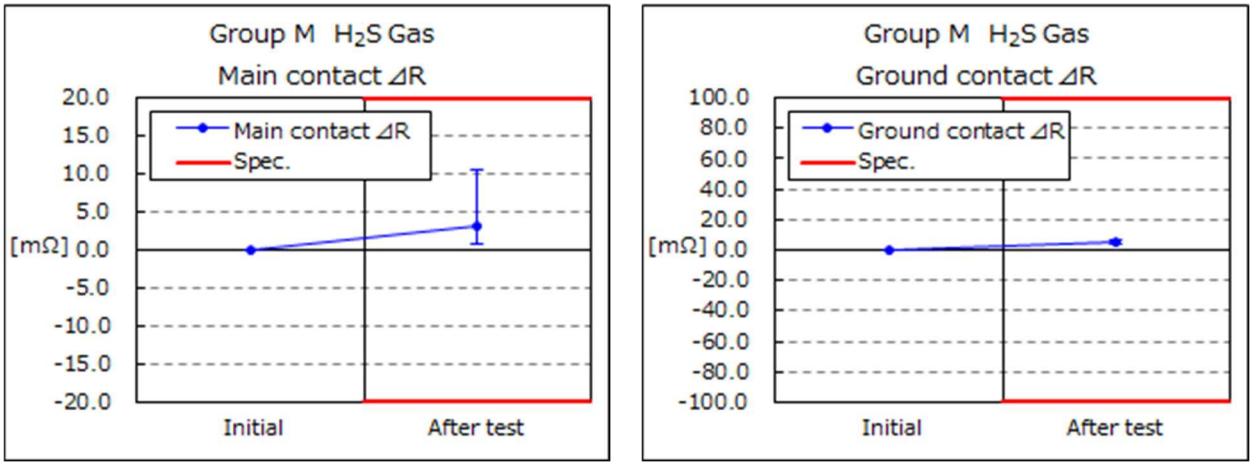


Graph 8 Group K Thermal shock

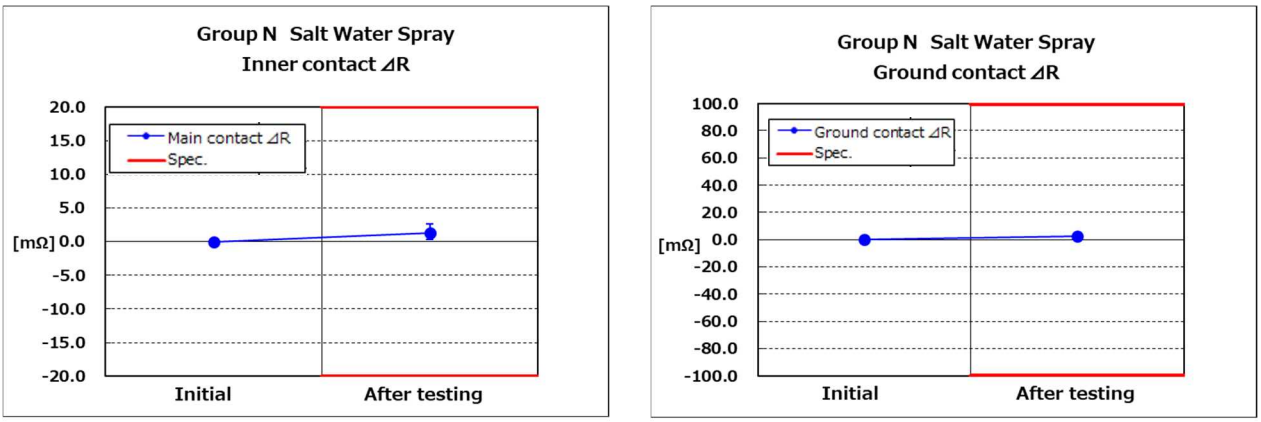




Graph 9 Group L High temperature life



Graph 10 Group M H_2S Gas



Graph 11 Group N Salt water spray