

MHF® 5 Connector
(AWG#36φ0.64 Cable)

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

Test Report

Product Specification no. PRS-2109

3	T22100	June 20, 2022	K.Watanabe	K.Yufu	Y.Hashimoto
2	T21106	October 27, 2021	K. Ikeshita		M. Takemoto
1	T17106	June 27, 2017	M.A		T.M
0	T15130	August 21, 2015	T.Yayoshi	K.Yotsutani	T.Takano
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of MHF 5 Connector AWG#36φ0.64 CableConnector in accordance with PRS-2109.

2. Specimen

Plug: 20711-001R-81

Receptacle: 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-2109.

The “n” in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-2109.

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TR-15063-03EN

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	10	-	-
	Receptacle	5			-									10	10

Numbers indicate sequence in which tests are performed.

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	-	1.098	1.11	1.09	0.005	Pass
	3.0~6.0GHz	1.50 MAX.		-	1.206	1.23	1.16	0.020	Pass
	6.0~9.0GHz	1.60 MAX.		-	1.335	1.38	1.29	0.028	Pass
	9.0~12.0GHz	1.80 MAX.		-	1.487	1.56	1.39	0.054	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
B	Unmating force								
	Initial	4N MIN.	10	N	10.61	11.6	9.7	0.64	Pass
	After 30 cycles	2N MIN.			5.89	6.6	5.4	0.40	Pass
C	Durability								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	10.82	12.3	10.0	0.73	Pass
	After 30 cycles	-			12.44	14.2	10.2	1.34	-
	ΔR	Δ20mΩ MAX.			1.62	3.2	-0.5	1.19	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	6.18	7.5	5.3	0.74	Pass
	After 30 cycles	-			7.48	8.4	6.1	0.89	-
	ΔR	Δ100mΩ MAX.			1.30	2.5	-0.1	0.96	Pass
	Appearance								
D	Spec: No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-	No abnormality				Pass
	After testing				No abnormality				Pass
E	Crimp strength								
	-	7N MIN.	10	N	11.77	12.20	11.46	0.23	Pass
E	Cable retention force								
	Electrical discontinuity								
	Spec: No electrical discontinuity greater than 1μs shall occur.								
E	After testing	-	10	-	No abnormality				Pass

Table 2-2

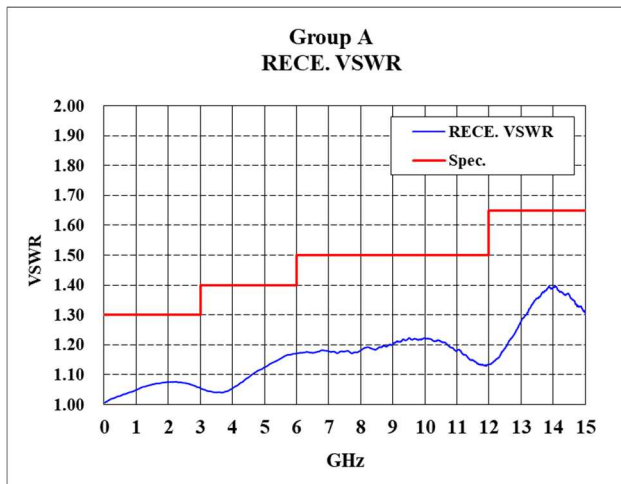
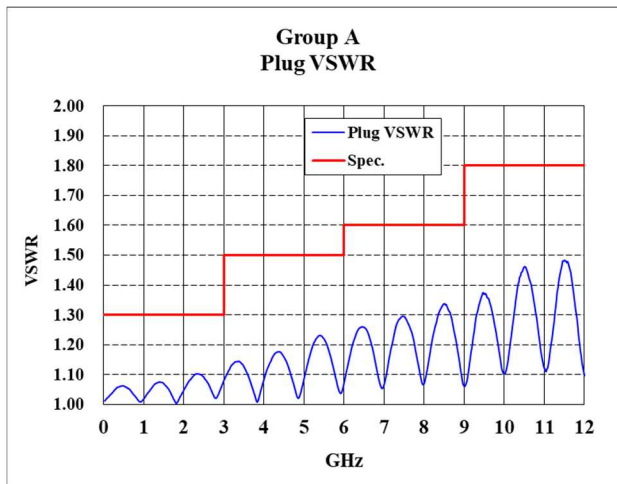
Group	Test items	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement
	Measurements								
F	Vibration								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	12.39	14.6	10.3	1.60	Pass
	After 30 cycles	-			13.41	15.5	11.3	1.44	-
	ΔR	Δ20mΩ MAX.			1.02	2.9	-0.3	1.06	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	6.10	7.3	5.0	0.72	Pass
	After 30 cycles	-			7.13	8.4	5.4	0.80	-
	ΔR	Δ100mΩ MAX.			1.03	2.6	-0.2	0.80	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	11.64	15.3	10.4	1.59	Pass
	After 30 cycles	-			13.39	15.4	11.4	1.56	-
	ΔR	Δ20mΩ MAX.			1.75	4.9	0.1	1.50	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	6.23	7.6	5.4	0.83	Pass
	After 30 cycles	-			7.27	8.2	6.1	0.58	-
	ΔR	Δ100mΩ MAX.			1.04	1.9	-0.2	0.81	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	12.76	15.4	10.7	1.61	Pass
	After 30 cycles	-			14.19	16.5	11.2	1.36	-
	ΔR	Δ20mΩ MAX.			1.43	3.5	-0.1	1.23	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	5.90	7.4	5.0	0.69	Pass
	After 30 cycles	-			7.08	9.0	5.5	0.88	-
	ΔR	Δ100mΩ MAX.			1.18	3.0	-0.2	1.03	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

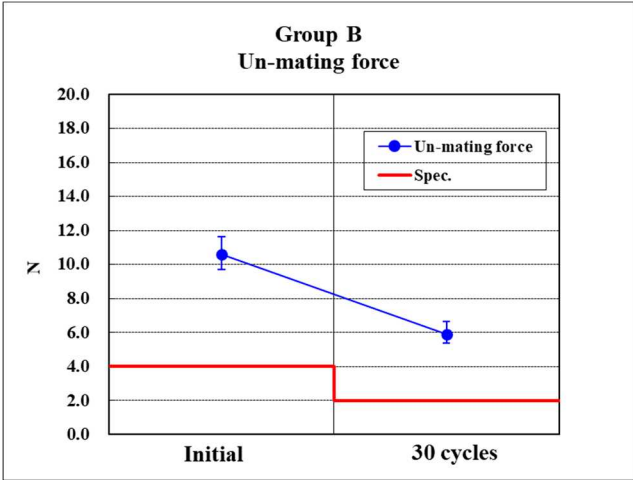
Group	Test items	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement	
	Measurements									
J	Thermal shock									
	Contact resistance of main contact									
	Initial	20mΩ MAX.	10	mΩ	13.08	14.4	10.6	1.27	Pass	
	After 30 cycles	-			14.28	15.5	11.3	1.32	-	
	ΔR	Δ20mΩ MAX.			1.20	4.0	-0.9	1.32	Pass	
	Contact resistance of Ground contact									
	Initial	20mΩ MAX.	10	mΩ	5.99	7.4	5.3	0.70	Pass	
	After 30 cycles	-			7.09	8.4	5.3	1.00	-	
	ΔR	Δ100mΩ MAX.			1.10	2.5	-0.1	0.92	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	12.14	13.7	10.5	0.99	Pass	
	After 30 cycles	-			13.09	15.0	11.2	1.33	-	
	ΔR	Δ20mΩ MAX.			0.95	2.3	-0.1	0.75	Pass	
	Contact resistance of Ground contact									
	Initial	20mΩ MAX.	10	mΩ	5.90	6.8	5.4	0.52	Pass	
	After 30 cycles	-			8.11	9.4	5.5	1.09	-	
	ΔR	Δ100mΩ MAX.			2.21	3.5	0.0	1.03	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	12.49	14.4	11.0	1.04	Pass
After 30 cycles		-	14.03			15.5	11.8	1.30	-	
ΔR		Δ20mΩ MAX.	1.55			4.5	0.0	1.47	Pass	
Contact resistance of Ground contact										
Initial		20mΩ MAX.	10	mΩ	6.02	6.5	5.4	0.47	Pass	
After 30 cycles		-			6.78	7.6	5.5	0.64	-	
ΔR		Δ100mΩ MAX.			0.76	2.1	-0.5	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

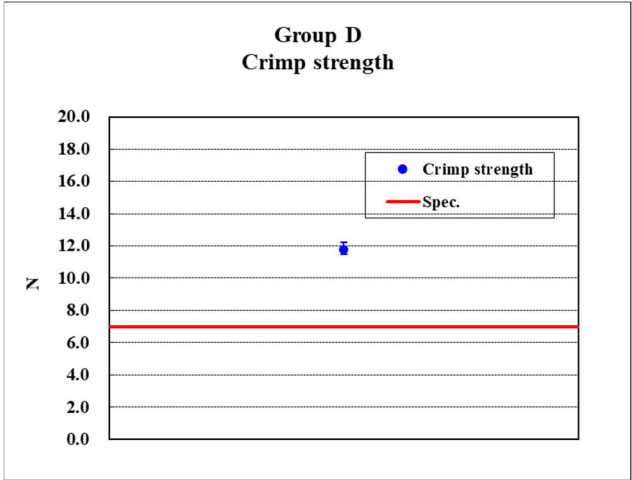
Group	Test items	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgement
	Measurements								
M	Saltwater spray								
	Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	12.48	14.3	11.0	1.00	Pass
	After 30 cycles	-			13.62	16.4	11.4	1.59	-
	ΔR	Δ20mΩ MAX.			1.14	4.9	-0.7	1.66	Pass
	Contact resistance of Ground contact								
	Initial	20mΩ MAX.	10	mΩ	6.17	6.9	5.2	0.52	Pass
	After 30 cycles	-			7.34	8.7	5.3	1.04	-
	ΔR	Δ100mΩ MAX.			1.17	2.5	0.1	0.69	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



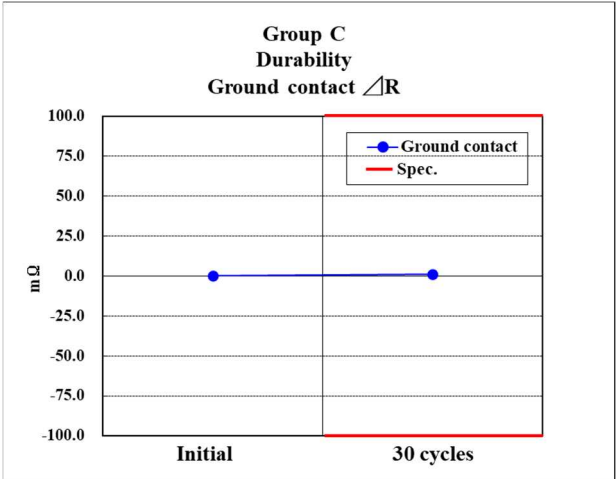
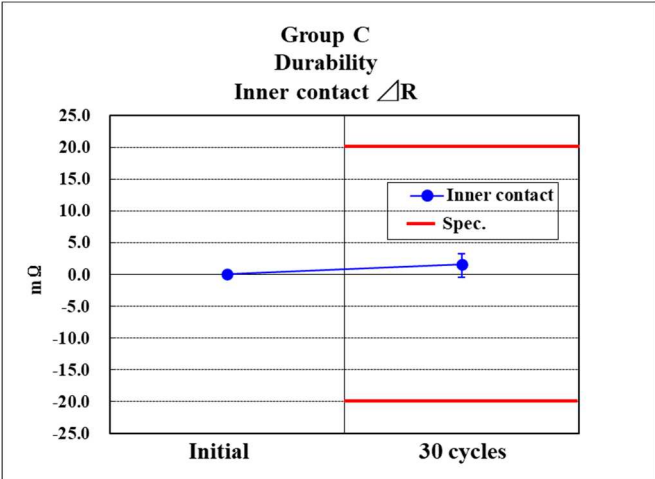
Graph 1 VSWR



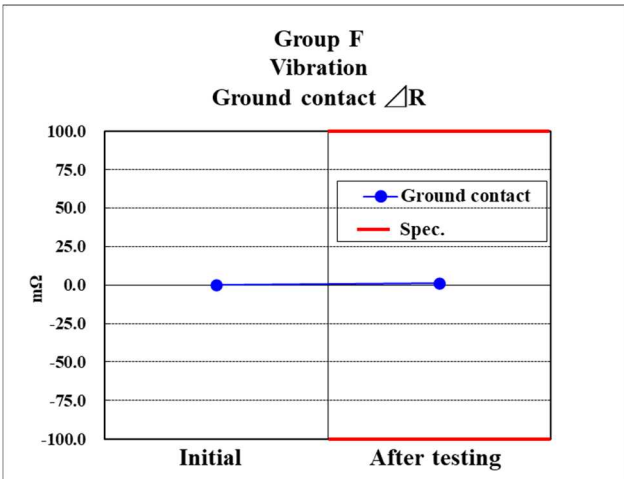
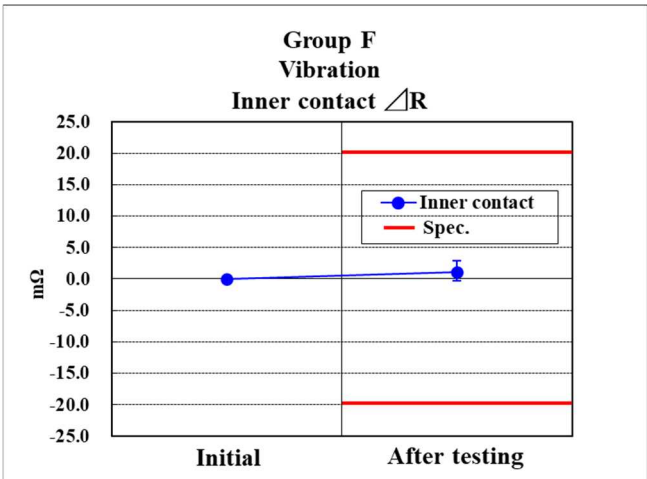
Graph 2 Unmating force



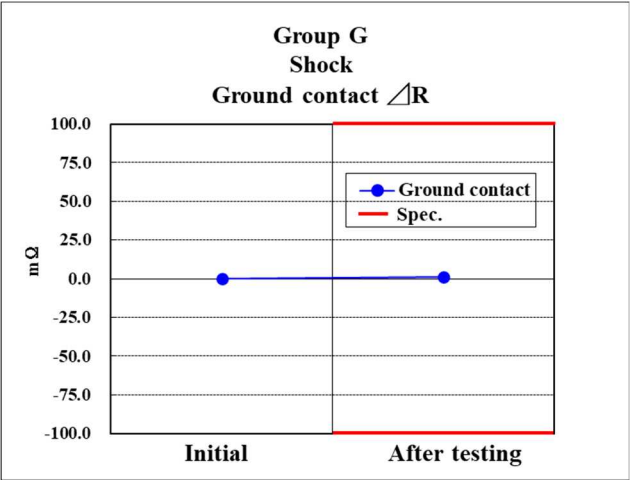
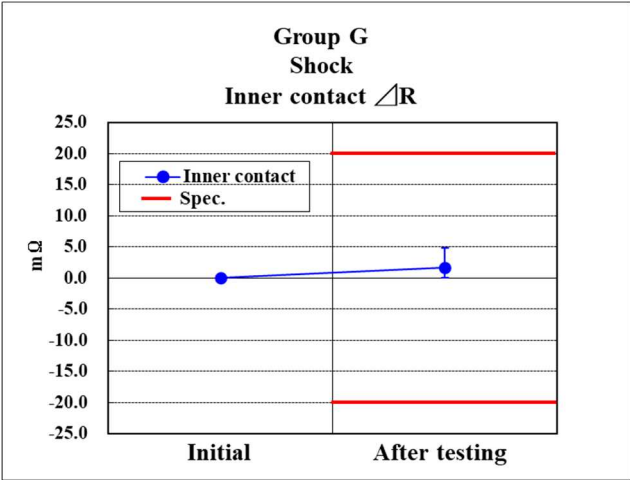
Graph 3 Crimp strength



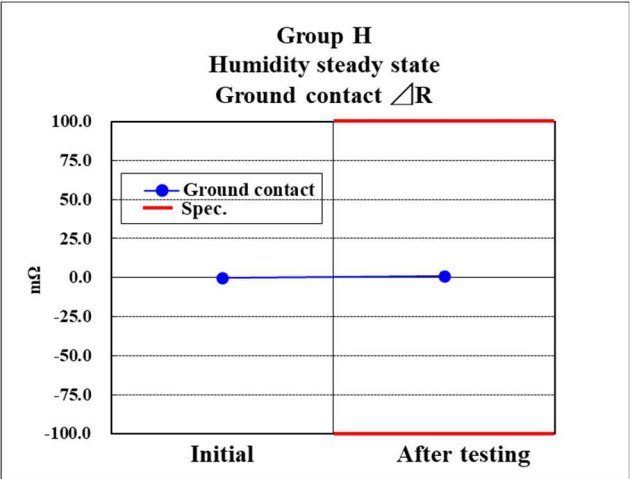
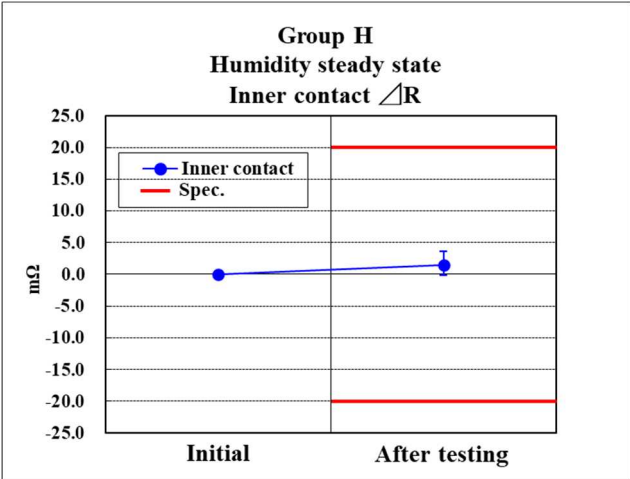
Graph 4 Durability



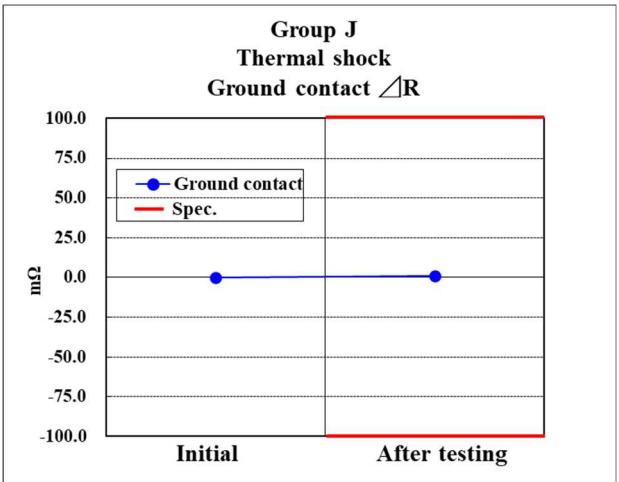
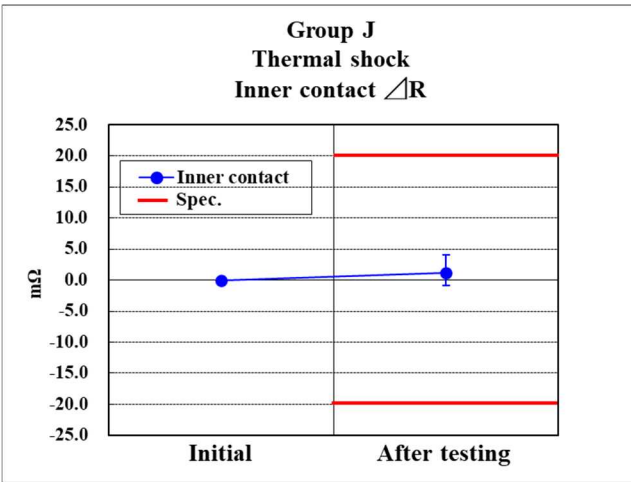
Graph 5 Vibration



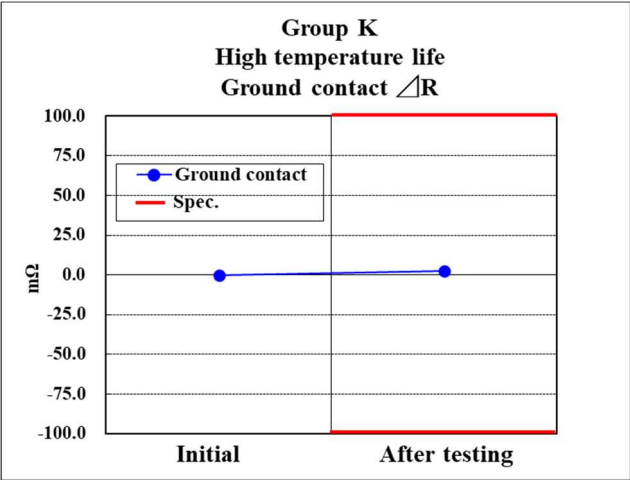
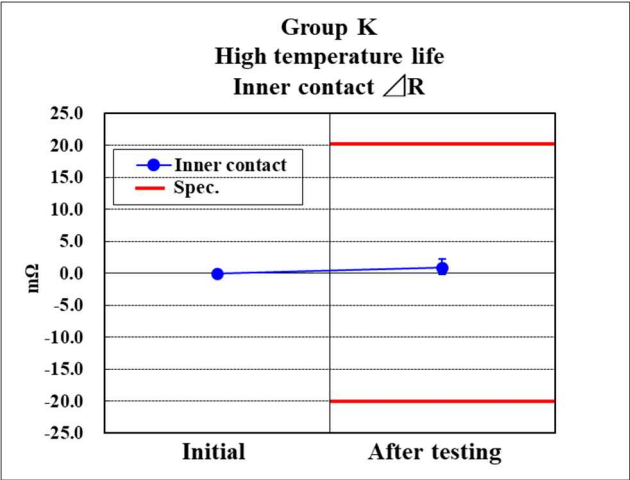
Graph 6 Shock



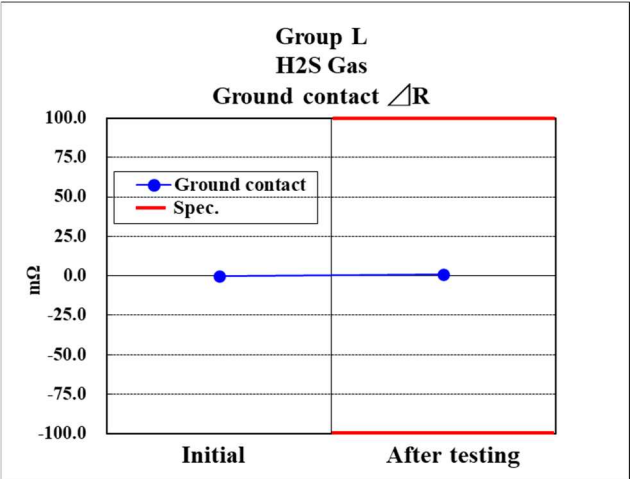
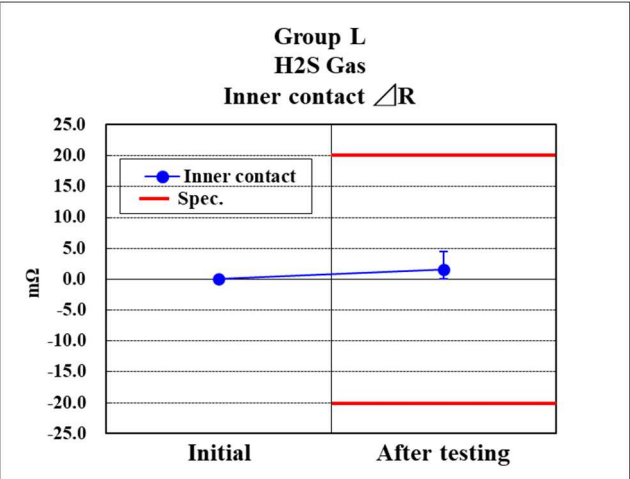
Graph 7 Humidity steady state



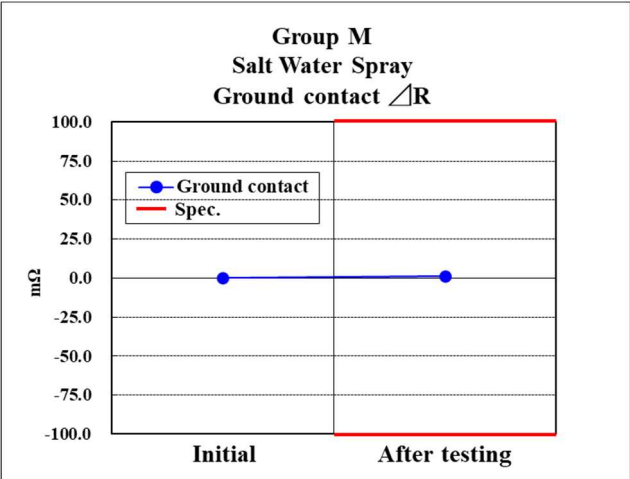
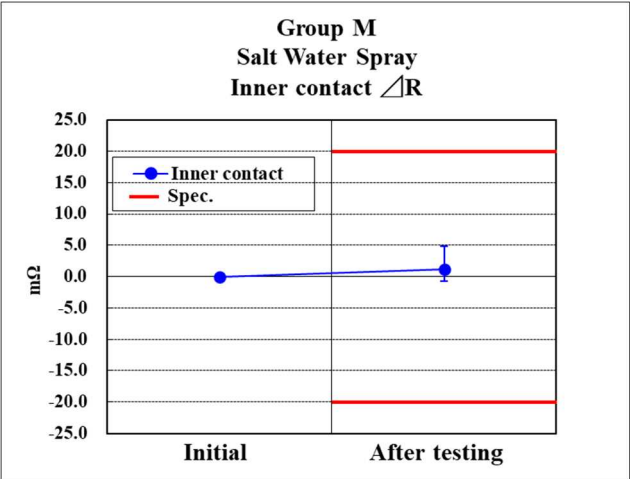
Graph 8 Thermal shock



Graph 9 High temperature life



Graph 10 H₂S Gas



Graph 11 Salt Water Spray