

MHF[®] 4 Connector

Part No. Plug: 20611-001R Receptacle: 20449-001E-03, -07

Test Report

Product Specification no. PRS-2530

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Rev.	ECN	Date	Prepared by	Checked by	Approved by

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1. Purpose

MHF 4 コネクタの性能を PRS-2530 に基づいて評価する。

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

2. Specimen

(1) Plug: 20611-001R

(2) Receptacle: 20449-001E-03

[Note] Part No. 20449-001E-03, -07 は梱包仕様のみ異なるため、Part No. 20449-001E-03 を代表の型番として評価。

** for the end of Part No. 20449-001E-03, -07, are different in the packing style only, so we tested part No. 20449-001E-03 as representative.

3. Test Sequence

全ての評価は Table 1 の試験順序に従って行った。

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

4. Result

表 2、シート 8 以降参照。試験条件の詳細は PRS-2530 参照。n 数は測定データを意味する。

See Table 2, and from sheet 8. 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

全ての資料が製品規格（PRS-2530）の必要条件を満足した。

All the specimens met the requirements of PRS-2530.

Table 1 試験順序と試料数／Test Sequence and Sample Quantity

試験項目 Test Item		グループ／Group														
		A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
接触抵抗 Contact Resistance						1, 3		1, 3	1, 3	1, 5	1, 5	1, 3	1, 3	1, 3		
絶縁抵抗 Insulation Resistance										2, 6	2, 6					
耐電圧 D. W. Voltage		1								3, 7	3, 7					
電圧定在波比 VSWR			1													
抜去力 Unmating Force				1												
引張強度 Crimp strength					1											
耐久性 Durability						2										
ケーブル保持力 Cable Retention Force							1									
耐振動性 Vibration								2								
耐衝撃性 Shock									2							
湿度（定常状態） Humidity (Steady State)										4						
熱衝撃 Thermal Shock											4					
高温寿命 High Temperature Life												2				
硫化水素ガス H2S Gas													2			
塩水噴霧 Salt Water Spray														2		
半田付け性 Solder ability															1	
半田耐熱性 Soldering Heat Resistance																1
試料数 Specimen Quantity. (pcs.)	PLUG	10	10	10	10	10	10	10	10	10	10	10	10	10	-	-
	RECEPTACLE	10	10	10	-	10	10	10	10	10	10	10	10	10	10	10
TEST BOARD (pcs.)		10	10	10	-	10	10	10	10	10	10	10	10	10	10	10

※グループ表中の番号は、試験順序を示す。／Numbers indicate sequence in which tests are performed.

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Table 2-1 試験結果/Test Result

Group	試験項目／Test items	規 格	試料数	単位	平均	最大	最小	S	判定
	測定項目／Measurements	Specification	N	Unit	AVE.	MAX.	MIN.	S	Judgement
A	耐電圧／Dielectric withstanding voltage								
	規格：沿面放電、空中放電、絶縁破壊等の異常無き事。 Spec: No creeping discharge, flashover, no insulator breakdown shall occur.								
	After testing	-	10	-	異常なし／No abnormality				Pass
B	電圧定在波比／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	抜去力／Unmating force								
	Initial	4 N MIN.	10	N	13.11	13.8	12.6	0.44	Pass
	After 30 cycles	2 N MIN.			8.48	9.3	7.7	0.59	Pass
D	引張り強度／Crimp strength								
	After testing	5 N MIN.	10	N	7.04	7.6	6.4	0.37	Pass
E	耐久性／Durability								
	中心導体接触抵抗／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	Pass
	ΔR	ΔR 20mΩ MAX.			0.11	1.6	-1.5	0.95	Pass
	外部導体接触抵抗／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	Pass
	ΔR	ΔR 100mΩ MAX.			0.93	2.9	-2.6	1.42	Pass
	外観／Appearance								
	Initial	No abnormality	10	-	異常なし／No abnormality				Pass
	After testing				異常なし／No abnormality				Pass
F	ケーブル保持力／Cable Retention Force								
	電流瞬断／Electrical discontinuity								
	規格：試験中、1μsを超える電氣的瞬断の無き事。 Spec: No electrical discontinuity greater than 1μs shall occur.								
	After testing	-	10	-	瞬断なし／No discontinuity				Pass
	外観／Appearance								
	規格：部品のゆるみ、欠け、割れ、その他外観上の異常の無き事。 Spec: Looseness between the parts, chipping, breakage or other abnormality shall not occur.								
After testing	-	10	-	異常なし／No abnormality				Pass	

Table 2-2 試験結果/Test Result

Group	試験項目／Test items	規 格	試料数	単位	平均	最大	最小	S	判定
	測定項目／Measurements	Specification	N	Unit	AVE.	MAX.	MIN.	S	Judgement
G	耐振動性／Vibration								
	中心導体接触抵抗／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	Pass
	ΔR	ΔR 20mΩ MAX.			-0.05	0.7	-0.6	0.50	Pass
	外部導体接触抵抗／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	Pass
	ΔR	ΔR 100mΩ MAX.			-0.10	0.8	-1.1	0.56	Pass
	電流瞬断／Electrical discontinuity								
	規格：試験中、1μsを超える電氣的瞬断の無き事。 Spec: No electrical discontinuity grater than 1μs shall occur.								
	After testing	-	10	-	瞬断なし／No discontinuity				Pass
	外観／Appearance								
	Initial	No abnormality	10	-	異常なし／No abnormality				Pass
	After testing				異常なし／No abnormality				Pass
H	耐衝撃性／Shock								
	中心導体接触抵抗／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	Pass
	ΔR	ΔR 20mΩ MAX.			0.53	2.0	-0.2	0.74	Pass
	外部導体接触抵抗／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	Pass
	ΔR	ΔR 100mΩ MAX.			0.32	0.7	0.0	0.22	Pass
	電流瞬断／Electrical discontinuity								
	規格：試験中、1μsを超える電氣的瞬断の無き事。 Spec: No electrical discontinuity grater than 1μs shall occur.								
	After testing	-	10	-	瞬断なし／No discontinuity				Pass
	外観／Appearance								
	Initial	No abnormality	10	-	異常なし／No abnormality				Pass
	After testing				異常なし／No abnormality				Pass

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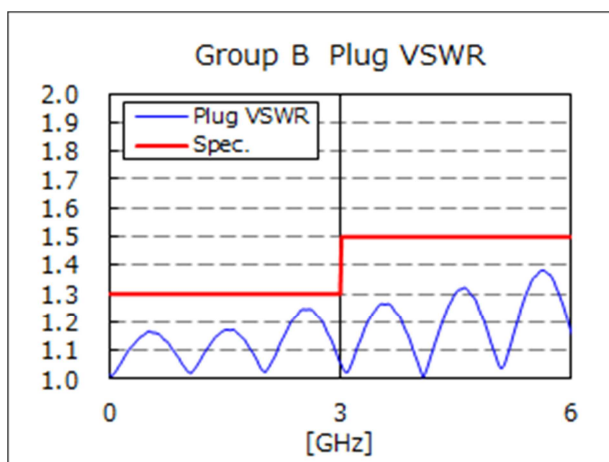
Table 2-3 試験結果/Test Result

Group	試験項目／Test items	規 格	試料数	単位	平均	最大	最小	S	判定
	測定項目／Measurements	Specification	N	Unit	AVE.	MAX.	MIN.	S	Judgement
J	湿度（定常状態）／Humidity (Steady State)								
	中心導体接触抵抗／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	Pass
	ΔR	ΔR 20mΩ MAX.			1.21	2.0	-0.3	0.75	Pass
	外部導体接触抵抗／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	Pass
	ΔR	ΔR 100mΩ MAX.			0.11	1.2	-1.4	0.68	Pass
	絶縁抵抗／Insulation residence								
	Initial	500MΩ MIN.	10	MΩ	10,000MΩ MIN.				Pass
	After testing	100MΩ MIN.			10,000MΩ MIN.				Pass
	耐電圧／Dielectric withstanding voltage								
	規格：沿面放電、空中放電、絶縁破壊等の異常無き事。 Spec: No creeping discharge, flashover, no insulator breakdown shall occur.								
	After testing	-	10	-	異常なし／No abnormality				Pass
	外観／Appearance								
	Initial	No abnormality	10	-	異常なし／No abnormality				Pass
After testing	異常なし／No abnormality				Pass				
K	熱衝撃／Thermal shock								
	中心導体接触抵抗／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	Pass
	ΔR	ΔR 20mΩ MAX.			0.42	2.7	-5.0	2.05	Pass
	外部導体接触抵抗／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	Pass
	ΔR	ΔR 100mΩ MAX.			2.46	5.5	1.1	1.38	Pass
	絶縁抵抗／Insulation residence								
	Initial	500MΩ MIN.	10	MΩ	10,000MΩ MIN.				Pass
	After testing	100MΩ MIN.			10,000MΩ MIN.				Pass
	耐電圧／Dielectric withstanding voltage								
	規格：沿面放電、空中放電、絶縁破壊等の異常無き事。 Spec: No creeping discharge, flashover, no insulator breakdown shall occur.								
	After testing	-	10	-	異常なし／No abnormality				Pass
	外観／Appearance								
	Initial	No abnormality	10	-	異常なし／No abnormality				Pass
After testing	異常なし／No abnormality				Pass				

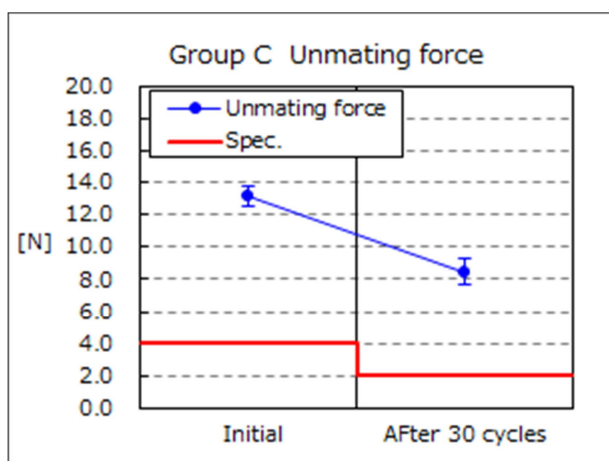
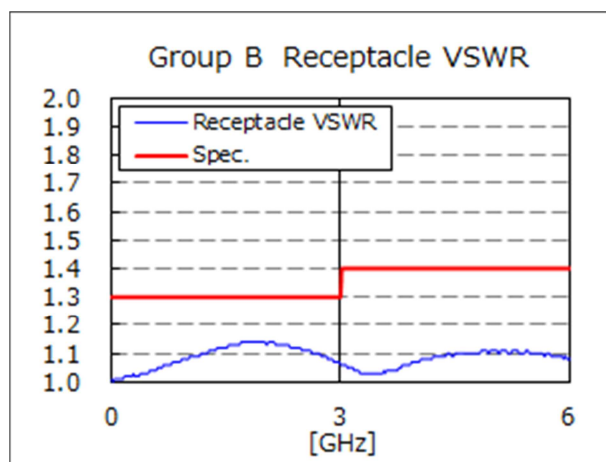
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Table 2-4 試験結果/Test Result

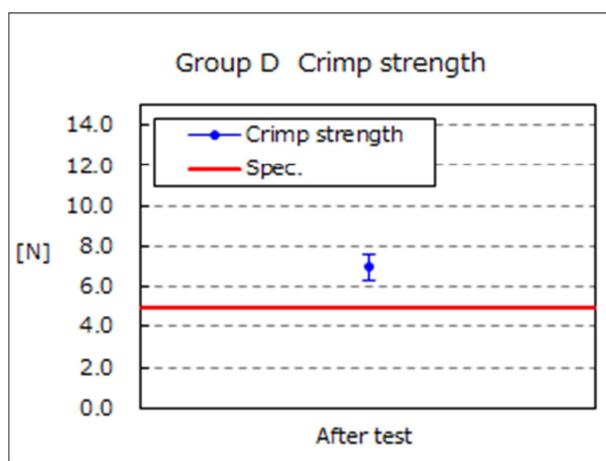
Group	試験項目／Test items	規 格	試料数	単位	平均	最大	最小	S	判定
	測定項目／Measurements	Specification	N	Unit	AVE.	MAX.	MIN.	S	Judgement
L	高温寿命／High Temperature Life								
	中心導体接触抵抗／Contact resistance of main contact								
	Initial	20mΩ MAX.	10	mΩ	6.08	7.2	5.2	0.60	Pass
	After testing	-			7.16	7.7	6.0	0.62	Pass
	ΔR	ΔR 20mΩ MAX.			1.08	1.9	0.5	0.43	Pass
	外部導体接触抵抗／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	Pass
	ΔR	ΔR 100mΩ MAX.			5.79	18.3	-0.4	5.56	Pass
	外観／Appearance								
	Initial	No abnormality	10	-	異常なし／No abnormality				Pass
	After testing				異常なし／No abnormality				Pass
M	硫化水素ガス／H ₂ S Gas								
	中心導体接触抵抗／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	Pass
	ΔR	ΔR 20mΩ MAX.			3.14	10.6	0.9	2.79	Pass
	外部導体接触抵抗／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	Pass
	ΔR	ΔR 100mΩ MAX.			2.79	4.2	1.4	0.75	Pass
	外観／Appearance								
	After testing	No abnormality	10	-	異常なし／No abnormality				Pass
	N	塩水噴霧／Salt water spray							
中心導体接触抵抗／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	Pass
ΔR		ΔR 20mΩ MAX.			1.27	2.6	0.3	0.67	Pass
外部導体接触抵抗／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	Pass
ΔR		ΔR 100mΩ MAX.			2.44	3.2	1.2	0.72	Pass
外観／Appearance									
After testing		No abnormality	10	-	異常なし／No abnormality				Pass
P		半田付け性／Solder ability							
	規格：浸した面線の95%以上に半田がむらなく付着すること。 Spec: More than 95% of the dipped surface shall be evenly wet.								
	After testing	-	10	-	異常なし／No abnormality				Pass
Q	半田耐熱性／Reflow soldering heat resistance								
	外観／Appearance								
	規格：機能を損なう変形及び、欠陥の無い事。 Spec: No abnormality adversely affecting the performance shall occur.								
	After testing	-	10	-	異常なし／No abnormality				Pass



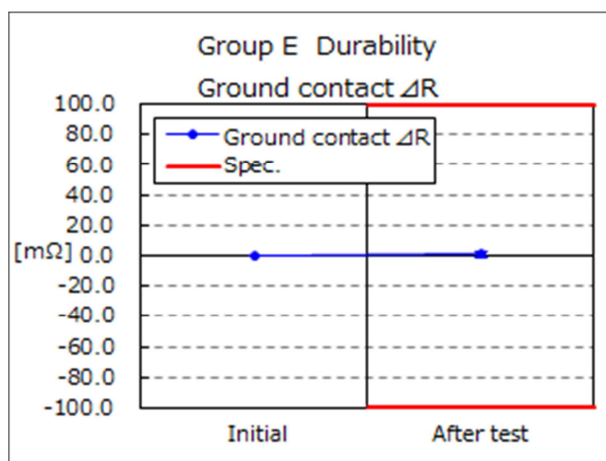
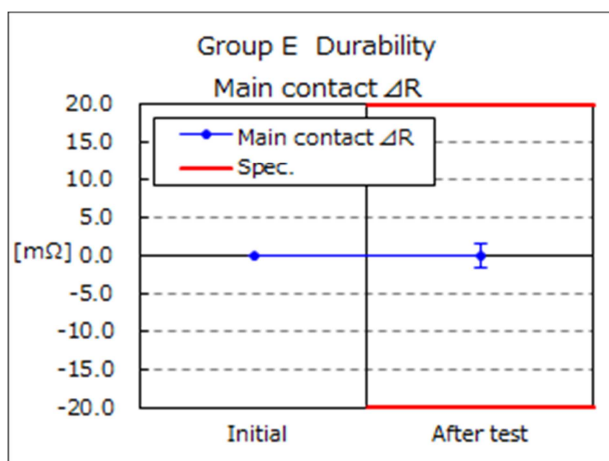
Graph 1 Group B VSWR



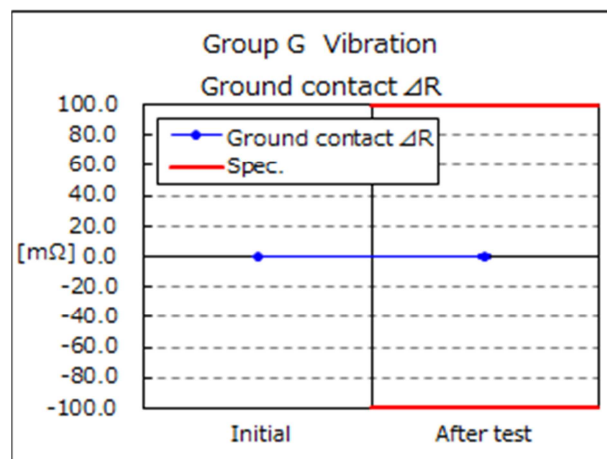
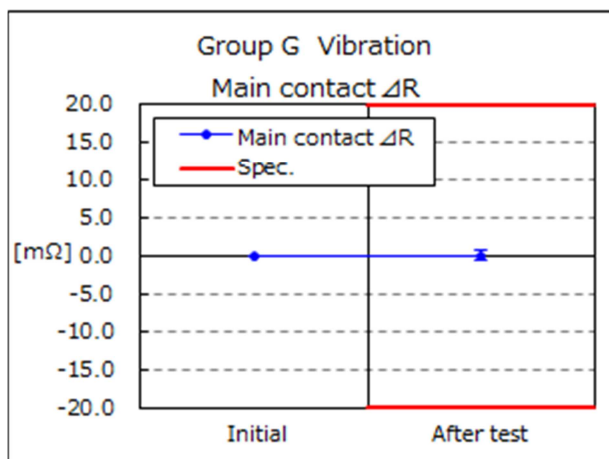
Graph 2 Group C Unmating force



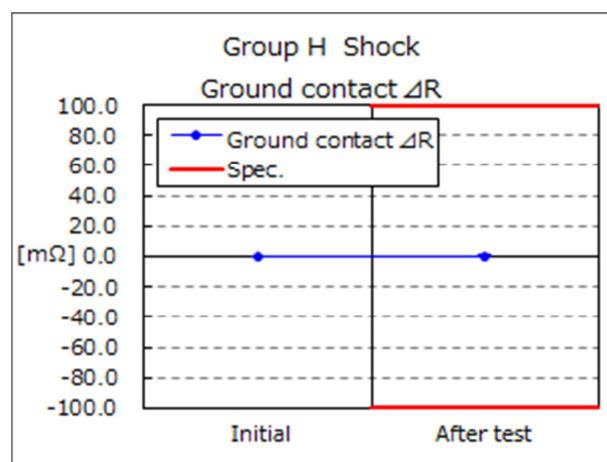
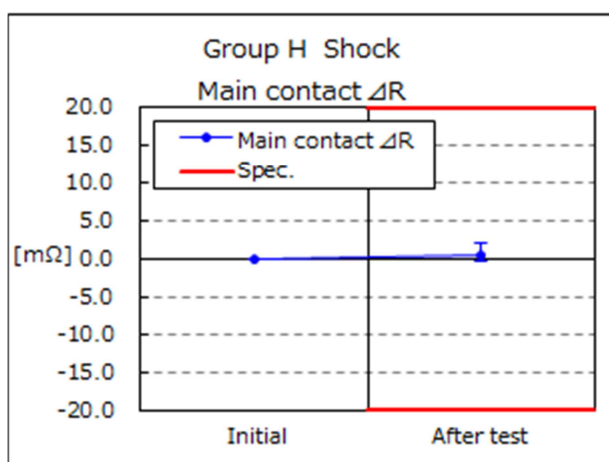
Graph 3 Group D Crimp strength



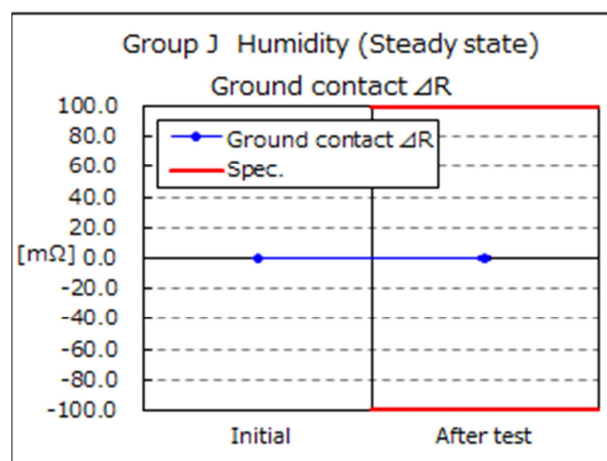
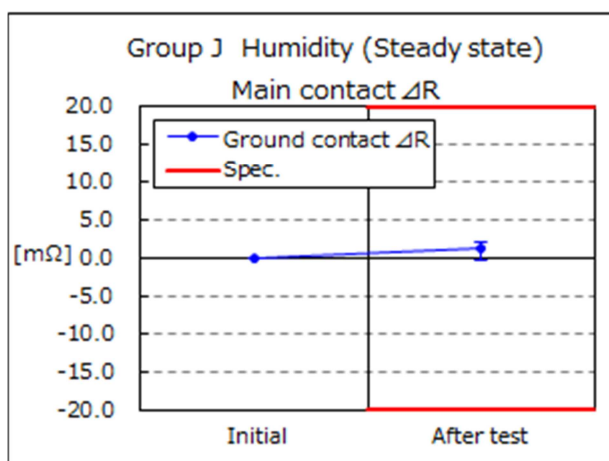
Graph 4 Group E Durability



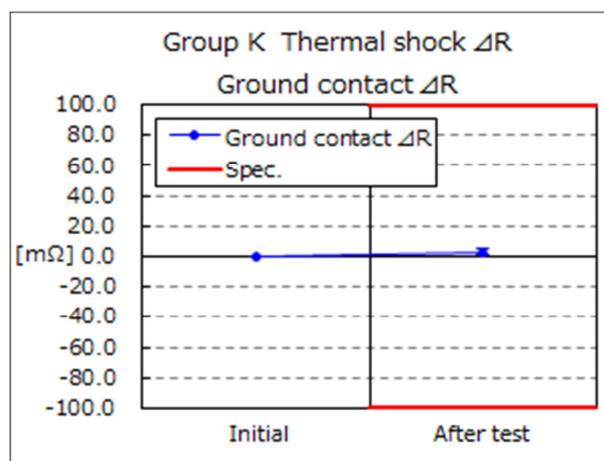
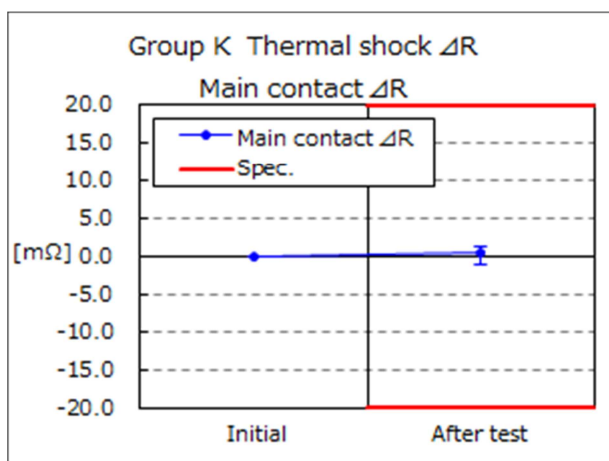
Graph 5 Group G VSWR



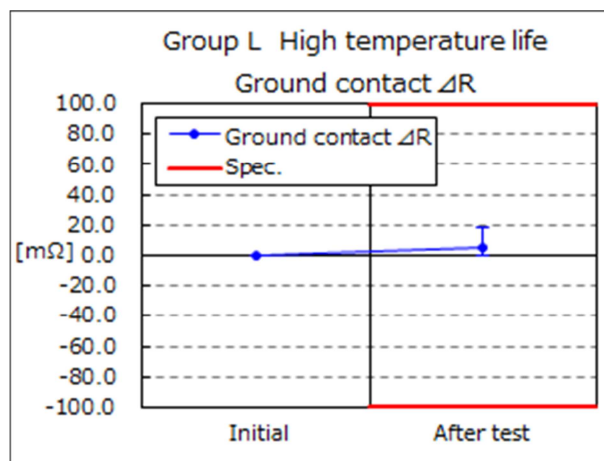
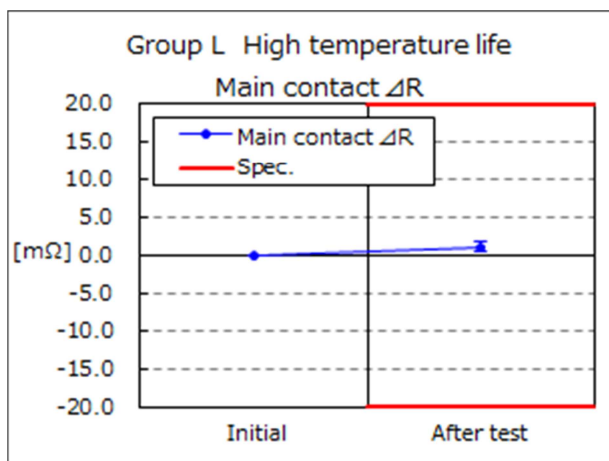
Graph 6 Group H Shock



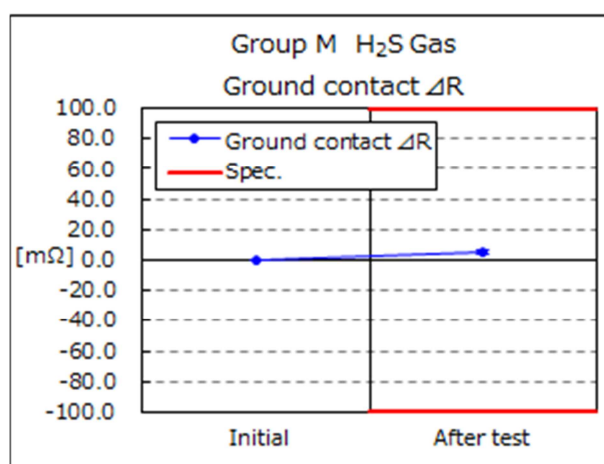
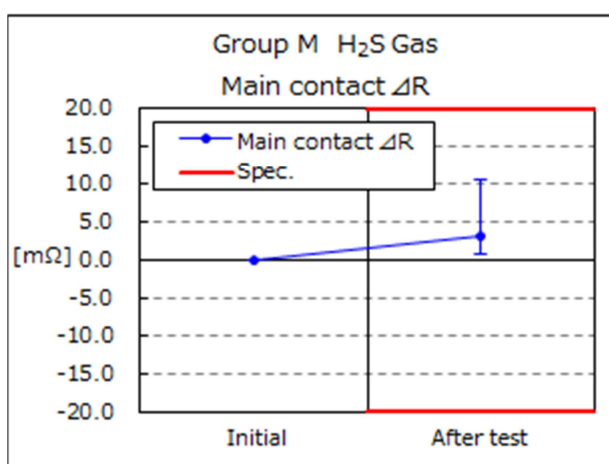
Graph 7 Group J Humidity (Steady state)



Graph 8 Group K Thermal shock



Graph 9 Group L High temperature life

Graph 10 Group M H_2S Gas