

MHF® 4L Connector

Part No. Plug: 20632-001R-37 Receptacle: 20449-001E-**

Test Report

Product Specification no. PRS-2008

4	T22110	June 27, 2022	H. Lu	Y. Shimizu	M. Takemoto
3	T22079	June 1, 2022	Y. Imaji	K. Yufu	Y. Hashimoto
2	T21097	October 26, 2021	K. Ikeshita		M. Takemoto
1	T18055	May 22, 2018	M. Abe	K. Shinozaki	T. Matsumoto
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of MHF 4L Connector in accordance with PRS-2008.

2. Specimen

- (1) MHF 4L Plug Connector (Part No. 20632-001R-37)
Cable: 20632-001R-37 AWG#30 coaxial cable (jacket diameter 1.37mm)
- (2) MHF 4 Receptacle Connector (Part No. 20449-001E)

3. Test Sequence

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

4. Result

See Table 2, Graph 1 to 10. For the details of the testing conditions and requirements, see PRS-2008.

The "n" in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-2008.

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	R	
Contact resistance						1,3		1,3	1,3	1,5	1,3	1,3	1,3	1,3			
Insulation resistance										2,6		2,6					
Dielectric withstanding voltage	1									3,7		3,7					
VSWR		1															
Mating force / Unmating force			1														
Cable retention force at 30 degree				1													
Cable retention force at 0 degree					1												
Durability						2											
Receptacle shearing strength							1										
Vibration								2									
Shock									2								
Thermal shock										4							
High temperature life											2						
Humidity (Steady state)												4					
Salt water spray													2				
H ₂ S gas														2			
Solder ability																1	
Soldering heat resistance																	1
Specimen quantity. (pcs.)	Plug	10	10	10	10	10	10	-	10	10	10	10	10	10	10	-	-
	Receptacle		5					12								10	10

※Numbers indicate sequence in which tests are performed.

Table 2-1

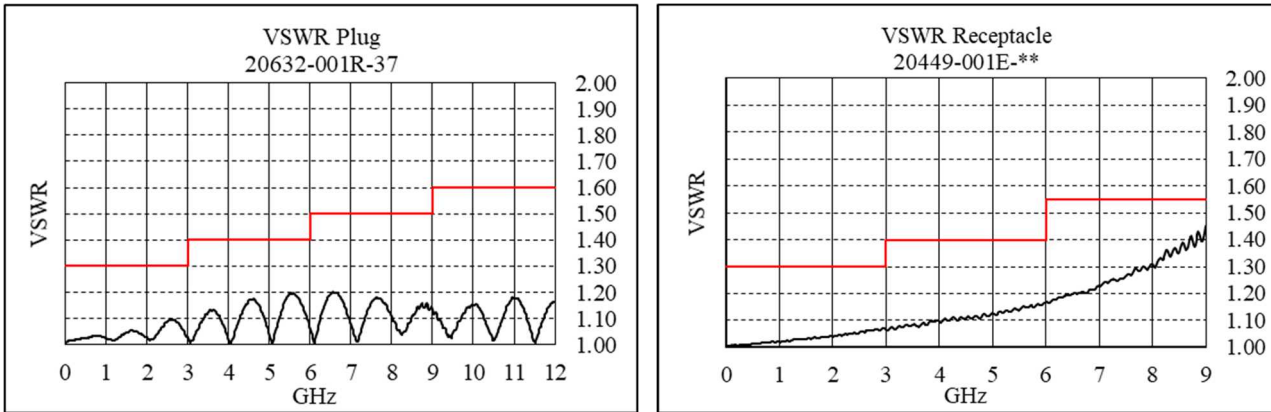
	Test items	Measurements	Spec.	n	Unit	AVE.	MAX.	MIN.	S	Judge			
A	Dielectric withstanding voltage	Initial 20632-001R-37	Spec : No creeping discharge,flashover,nor insulator breakdown shall occur.							-----	OK		
			-----	10	-----	Results : No abnormality							
B	VSWR Plug	20632-001R-37	0.1~3GHz	1.30 MAX.	10	-----	1.092	1.10	1.08	0.050	OK		
			3~6GHz	1.40 MAX.	10	-----	1.183	1.22	1.14	0.021	OK		
			6~9GHz	1.50 MAX.	10	-----	1.186	1.22	1.13	0.030	OK		
			9~12GHz	1.60 MAX.	10	-----	1.385	1.53	1.25	0.064	OK		
	VSWR Receptacle	20449-001E-**	0.1~3GHz	1.30MAX.	5	-----	1.067	1.08	1.06	0.007	OK		
			3~6GHz	1.40 MAX.	5	-----	1.176	1.19	1.16	0.010	OK		
			6~9GHz	1.55 MAX.	5	-----	1.465	1.50	1.43	0.207	OK		
C	Mating force	20632-001R-37	Initial	30 MAX.	10	N	20.25	22.5	18.0	1.45	OK		
			30 cycles		10	N	9.77	10.3	9.2	0.40	OK		
	Un mating force	20632-001R-37	Initial	20 MAX. 5 MIN.	10	N	13.71	15.4	12.3	0.94	OK		
			30 cycles	20 MAX. 3 MIN.	10	N	8.80	9.6	7.8	0.47	OK		
D	Cable retention force at 0 degree												
	20632-001R-37	Electrical discontinuity	Spec. : No electrical discontinuity grater than 1μs shall occur.								-----	OK	
			-----	10	-----	Results : No discontinity							
	20632-001R-37	Appearance	Spec:No abnormality adversely affecting the performance shall occur.										
			Initial	No abnormality	10	-----	No abnormality			OK			
After testing			No abnormality	10	-----	No abnormality			OK				
E	Durability												
	20632-001R-37	Contact resistance of inner contact											
		Initial	20 MAX.	10	mΩ	6.30	7.3	5.3	0.58	OK			
		After testing	-----	10	mΩ	6.61	7.3	5.7	0.64	-----			
		ΔR	20 MAX.	10	mΩ	0.31	1.5	-0.4	0.58	OK			
		Contact resistance of ground contact											
		Initial	20 MAX.	10	mΩ	5.56	6.8	5.1	0.56	OK			
		After testing	-----	10	mΩ	6.53	8.2	5.9	0.67	-----			
		ΔR	20 MAX.	10	mΩ	0.97	1.7	0.1	0.51	OK			
		20632-001R-37	Appearance	Spec:No abnormality adversely affecting the performance shall occur.									
				Initial	No abnormality	10	-----	No abnormality			OK		
After testing				No abnormality	10	-----	No abnormality			OK			
F	Shearing strength												
	20449-001E-**	Direction① Direction② Direction③ Direction④	20N MIN.	3	N	37.7	30.1	33.7	-----	OK			
				3	N	30.8	27.5	25.2	-----	OK			
				3	N	28.6	25.8	28.4	-----	OK			
				3	N	26.8	29.8	25.8	-----	OK			
G	Vibration												
	20632-001R-37	Contact resistance of inner contact											
		Initial	20 MAX.	10	mΩ	5.95	7.0	5.4	0.52	OK			
		After testing	-----	10	mΩ	6.71	7.4	6.2	0.47	-----			
		ΔR	20 MAX.	10	mΩ	0.76	2.0	0.0	0.59	OK			
		Contact resistance of ground contact											
		Initial	20 MAX.	10	mΩ	6.05	6.7	5.4	0.42	OK			
		After testing	-----	10	mΩ	6.94	8.1	5.9	0.73	-----			
		ΔR	20 MAX.	10	mΩ	0.89	2.0	-0.6	0.87	OK			
		20632-001R-37	Electrical discontinuity	Spec. : No electrical discontinuity grater than 1μsec. shall occur.								-----	
				-----	10	-----	Results : No discontinity			OK			
		20632-001R-37	Appearance	Spec:No abnormality adversely affecting the performance shall occur.									
				Initial	No abnormality	10	-----	No abnormality			OK		
After testing				No abnormality	10	-----	No abnormality			OK			

Table 2-2

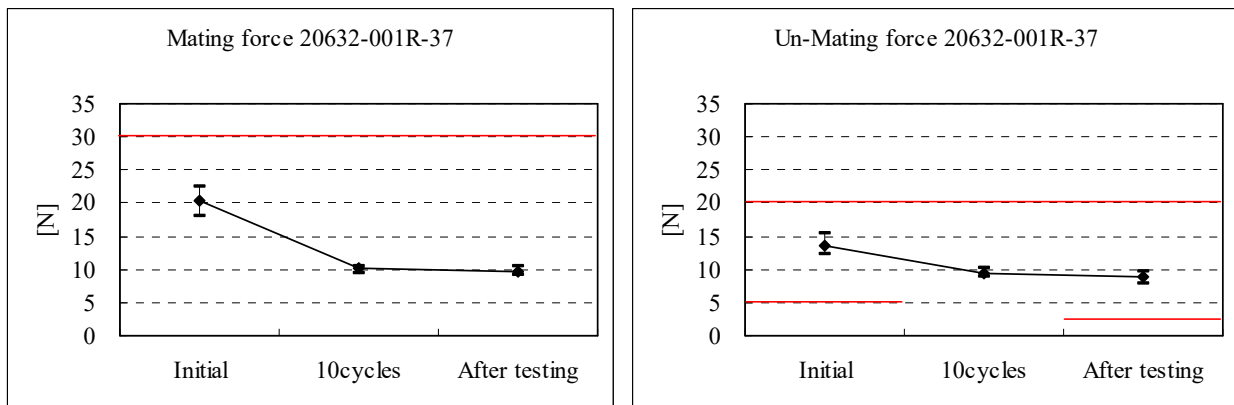
Test items	Measurements	Spec.	n	Unit	AVE.	MAX.	MIN.	S	Judge	
H	Shock									
20632-001R-37	Contact resistance of inner contact									
	Initial	20 MAX.	10	mΩ	6.71	7.4	6.2	0.47	OK	
	After testing	-----	10	mΩ	7.19	7.8	6.4	0.43	-----	
	ΔIR	20 MAX.	10	mΩ	0.48	1.6	-0.9	0.79	OK	
	Contact resistance of ground contact									
	Initial	20 MAX.	10	mΩ	6.94	8.1	5.9	0.73	OK	
	After testing	-----	10	mΩ	7.32	8.4	6.2	0.70	-----	
	ΔIR	20 MAX.	10	mΩ	0.38	1.5	-0.3	0.55	OK	
	Electrical discontinuity	Spec. : No electrical discontinuity greater than 1μsec. shall occur.							-----	-----
			10	-----	Results : No discontinuity				OK	
	Appearance	Spec:No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-----	No abnormality				OK	
	After testing	No abnormality	10	-----	No abnormality				OK	
	J	Thermal shock								
20632-001R-37	Contact resistance of inner contact									
	Initial	20 MAX.	10	mΩ	6.23	6.9	5.5	0.42	OK	
	After testing	-----	10	mΩ	6.90	7.6	6.3	0.41	-----	
	ΔIR	20 MAX.	10	mΩ	0.68	1.4	-0.4	0.51	OK	
	Contact resistance of ground contact									
	Initial	20 MAX.	10	mΩ	5.69	6.6	5.1	0.65	OK	
	After testing	-----	10	mΩ	6.90	8.0	6.0	0.62	-----	
	ΔIR	20 MAX.	10	mΩ	1.21	2.3	-0.5	0.86	OK	
	Insulation resistance									
	Initial	500 MIN.	10	MΩ	10,000 (minimum vale)				OK	
	After testing	100 MIN.	10	MΩ	10,000 (minimum vale)				OK	
	Dielectric withstanding voltage									
	Initial	No abnormality	10	-----	No abnormality				OK	
	After testing	No abnormality	10	-----	No abnormality				OK	
	Appearance	Spec:No abnormality adversely affecting the performance shall occur.								
	Initial	No abnormality	10	-----	No abnormality				OK	
	After testing	No abnormality	10	-----	No abnormality				OK	
	K	High temperature life								
	20632-001R-37	Contact resistance of inner contact								
		Initial	20 MAX.	10	mΩ	6.31	7.3	5.4	0.74	OK
After testing		-----	10	mΩ	7.00	7.6	6.1	0.44	-----	
ΔIR		20 MAX.	10	mΩ	0.69	2.0	-0.3	0.78	OK	
Contact resistance of ground contact										
Initial		20 MAX.	10	mΩ	6.17	6.8	5.4	0.43	OK	
After testing		-----	10	mΩ	6.77	7.6	6.1	0.52	-----	
ΔIR		20 MAX.	10	mΩ	0.60	2.2	-0.3	0.68	OK	
Appearance		Spec:No abnormality adversely affecting the performance shall occur.								
Initial		No abnormality	10	-----	No abnormality				OK	
After testing		No abnormality	10	-----	No abnormality				OK	

Table 2-3

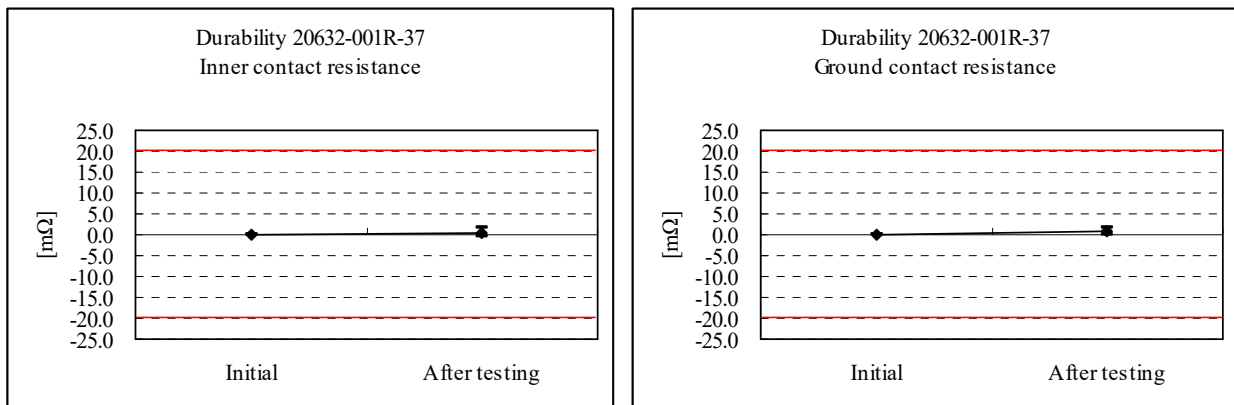
Test items	Measurements	Spec.	n	Unit	AVE.	MAX.	MIN.	S	Judge	
L Humidity(Steady State)										
20632-001R-37	Contact resistance of inner contact									
	Initial	20 MAX.	10	mΩ	6.65	7.0	5.9	0.40	OK	
	After testing	-----	10	mΩ	7.03	8.2	6.1	0.74	-----	
	ΔR	20 MAX.	10	mΩ	0.38	1.8	-0.9	0.90	OK	
	Contact resistance of ground contact									
	Initial	20 MAX.	10	mΩ	5.94	6.7	5.2	0.51	OK	
	After testing	-----	10	mΩ	6.91	8.1	6.2	0.59	-----	
	ΔR	20 MAX.	10	mΩ	0.97	2.2	-0.4	0.86	OK	
	Insulation resistance									
	Initial	500 MIN.	10	MΩ	10,000 (minimum vale)				OK	
	After testing	100 MIN.	10	MΩ	10,000 (minimum vale)				OK	
	Dielectric withstanding voltage									
	Initial	No abnormality	10	-----	No abnormality				OK	
	After testing	No abnormality	10	-----	No abnormality				OK	
	Appearance									
Spec.:No abnormality adversely affecting the performance shall occur.										
Initial	No abnormality	10	-----	No abnormality				OK		
After testing	No abnormality	10	-----	No abnormality				OK		
M Salt water spray										
20632-001R-37	Contact resistance of inner contact									
	Initial	20 MAX.	10	mΩ	6.47	7.3	5.5	0.68	OK	
	After testing	-----	10	mΩ	7.17	8.3	6.5	0.56	-----	
	ΔR	20 MAX.	10	mΩ	0.71	1.5	-0.4	0.60	OK	
	Contact resistance of ground contact									
	Initial	20 MAX.	10	mΩ	6.04	6.8	5.4	0.51	OK	
	After testing	-----	10	mΩ	6.73	7.9	5.9	0.62	-----	
	ΔR	20 MAX.	10	mΩ	0.70	1.9	-0.5	0.75	OK	
	Appearance									
	Spec.:No abnormality adversely affecting the performance shall occur.									
	Initial	No abnormality	10	-----	No abnormality				OK	
	After testing	No abnormality	10	-----	No abnormality				OK	
	N H ₂ S Gas									
	20632-001R-37	Contact resistance of inner contact								
		Initial	20 MAX.	10	mΩ	6.68	7.3	6.1	0.40	OK
After testing		-----	10	mΩ	6.74	7.9	6.1	0.60	-----	
ΔR		20 MAX.	10	mΩ	0.05	1.2	-1.2	0.78	OK	
Contact resistance of ground contact										
Initial		20 MAX.	10	mΩ	6.30	6.7	5.7	0.36	OK	
After testing		-----	10	mΩ	7.28	8.1	6.4	0.54	-----	
ΔR		20 MAX.	10	mΩ	0.98	1.7	0.0	0.58	OK	
Appearance										
Spec.:No abnormality adversely affecting the performance shall occur.										
Initial		No abnormality	10	-----	No abnormality				OK	
After testing		No abnormality	10	-----	No abnormality				OK	
P Solderability										
		Spec.:More than 95% of the dipped surface becomes wet and the pinhole that should not gather at one point is less than 5%.								
		-----	10	-----	No abnormality				OK	
Q Reflow soldering heat resistance										
		Spec.:Abnormality adversely affecting the performance should not occur.								
		-----	10	-----	No abnormality				OK	



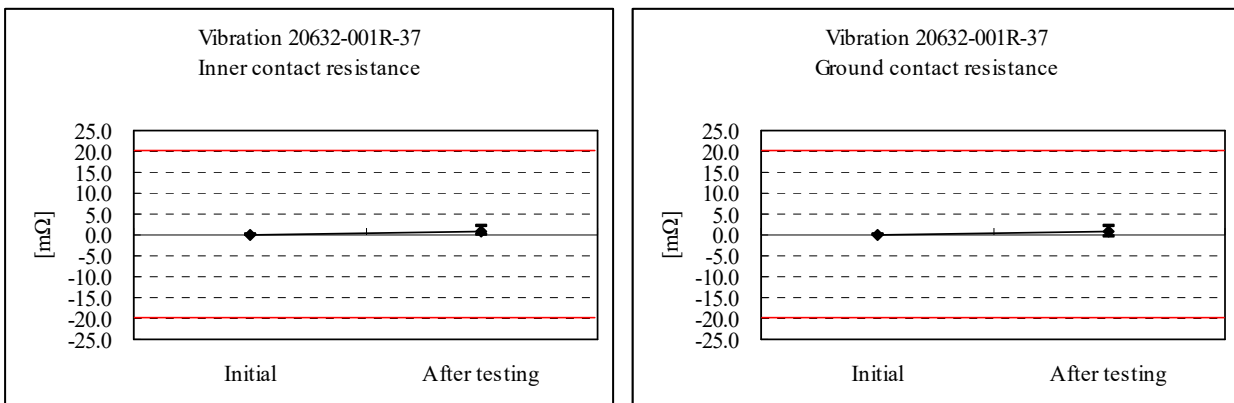
Graph 1 VSWR



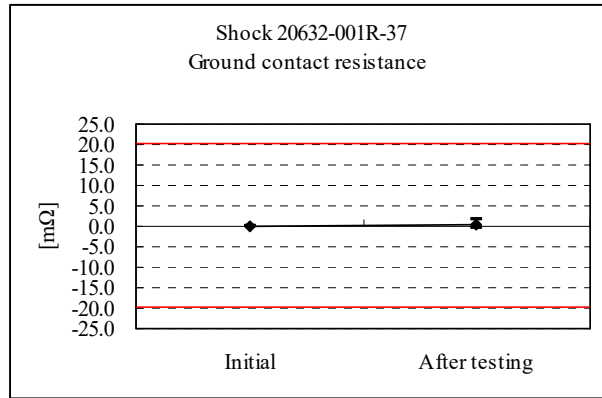
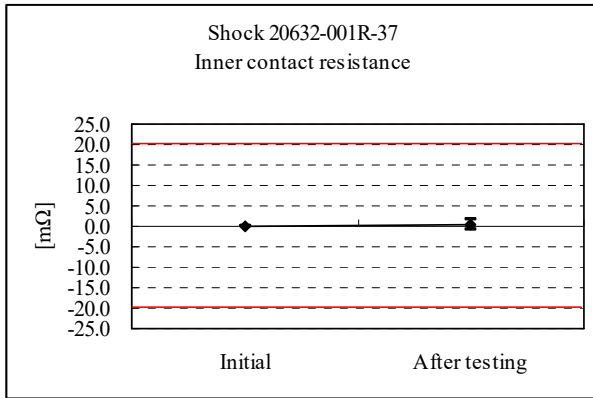
Graph 2 Mating force, Unmating force



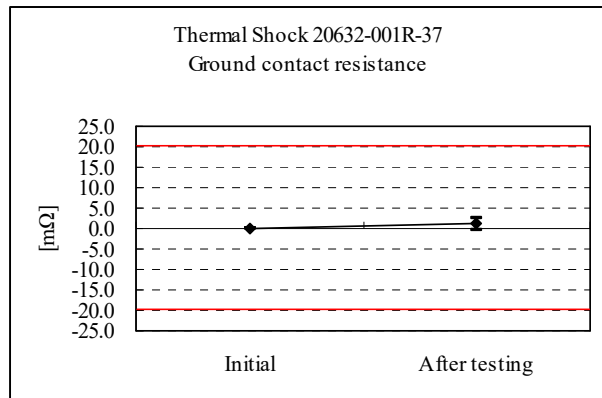
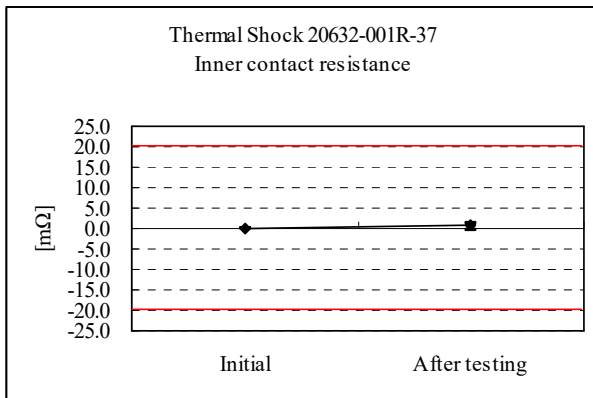
Graph 3 Durability



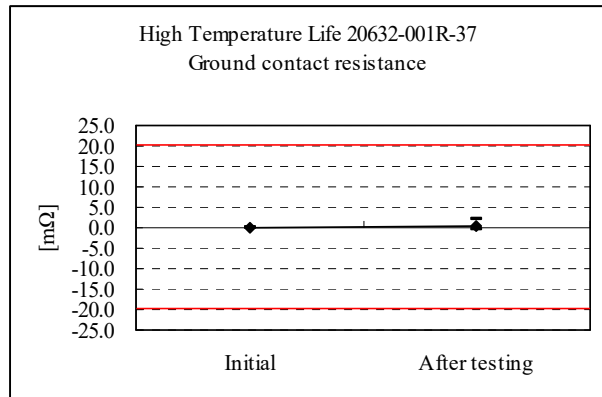
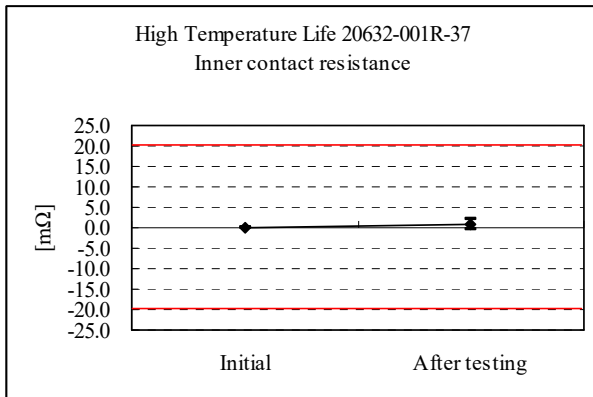
Graph 4 Vibration



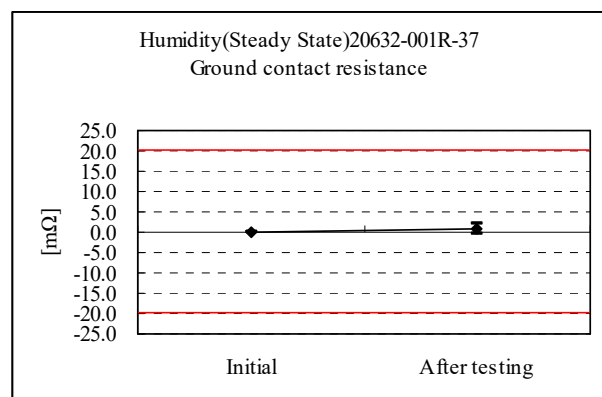
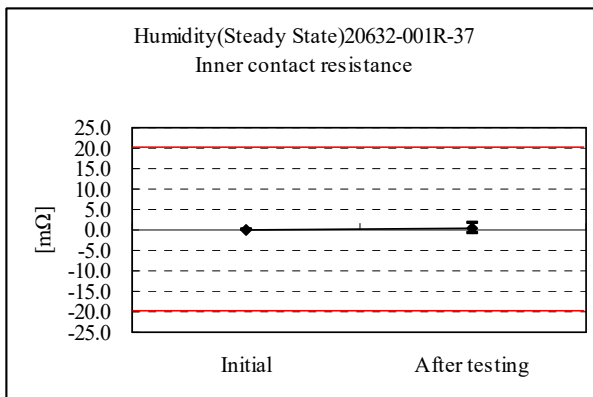
Graph 5 Shock



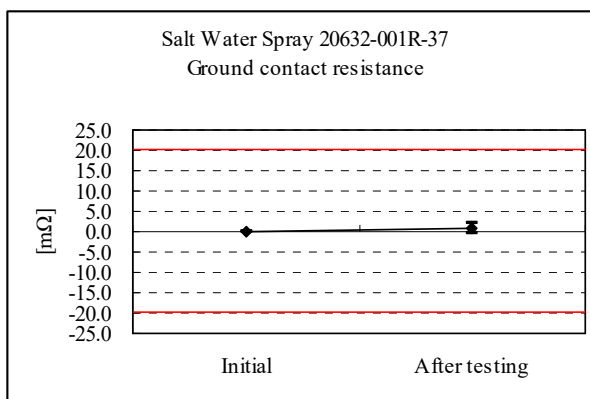
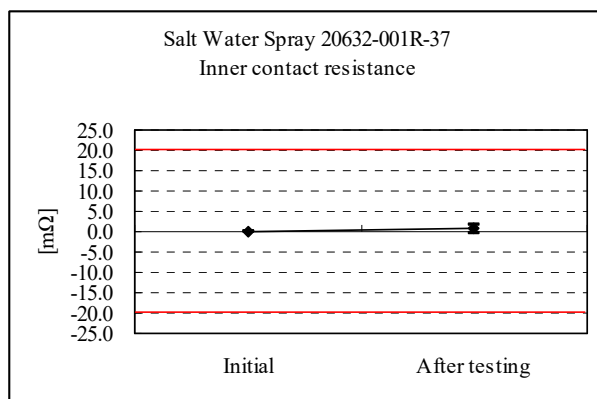
Graph 6 Thermal Shock



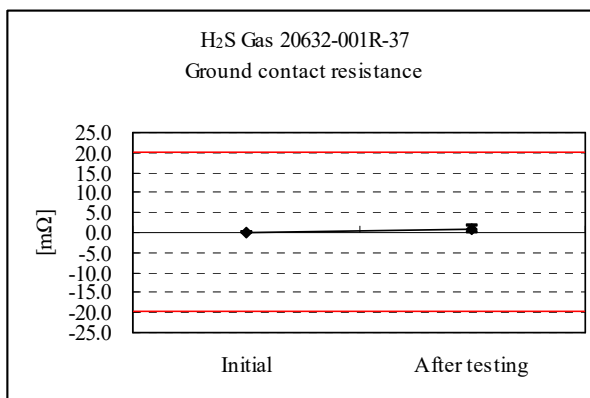
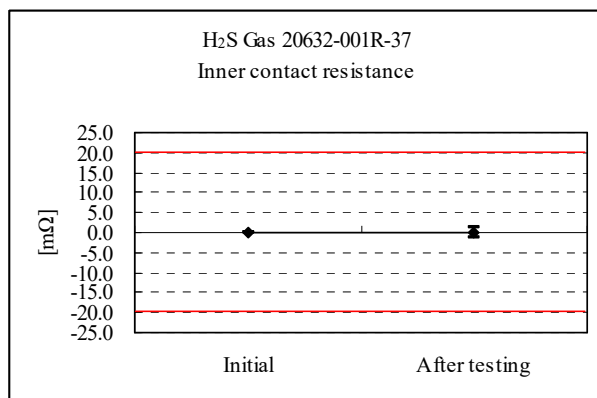
Graph 7 High Temperature



Graph 8 Humidity(Steady State)



Graph 9 Salt Water Spray



Graph 10 H₂S Gas