

MHF[®] 4L Connector (AWG#36 φ0.64 Cable)

Part No. Plug: 20572-001R-08 Receptacle: 20449-001E-**

Test Report

Product Specification no. PRS-1944

4	T21096	October 22, 2021	K. Ikeshita		M. Takemoto
3	T20091	November 9, 2020	Y. Shiozawa	K. Ikeshita	M. Takemoto
2	T17128	Aug./08/'17	M. Abe		T. Matsumoto
1	T15030	Feb./26/'15	K. Ikeshita		T. Takano
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of MHF 4L Connector in accordance with PRS-1944.

2. Specimen

- (1) MHF 4L PLUG ASS'Y (Part No. 20572-001R-08)
- (2) MHF 4L RECEPTACLE ASS'Y (Part No. 20449-001E-**)

3. Test Sequence

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

4. Result

See Table 1 to 2, Graph 1 to 10. For the details of the testing conditions and requirements, see PRS-1944.
The "n" in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-1944.

Table 1 Test Sequence and Sample Quantity

Test items	Group													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Contact resistance					1,3	1,3	1,3	1,5	1,3	1,5	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											
Crimp strength				1										
Durability					2									
Vibration						2								
Shock							2							
Thermal shock								4						
High temperature life									2					
Humidity(Steady state)										4				
Saltwater spray											2			
H2S Gas												2		
Solder ability													1	
Reflow soldering heat resistance														1
Sample quantity	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.

※Numbers indicate test sequences

Table 2-1 Test result

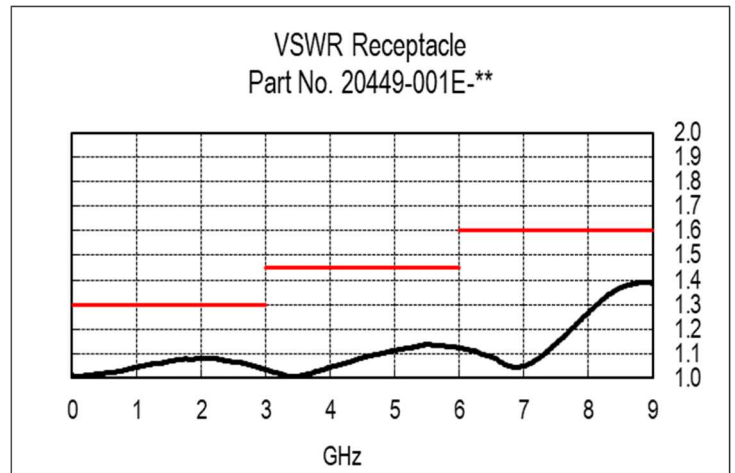
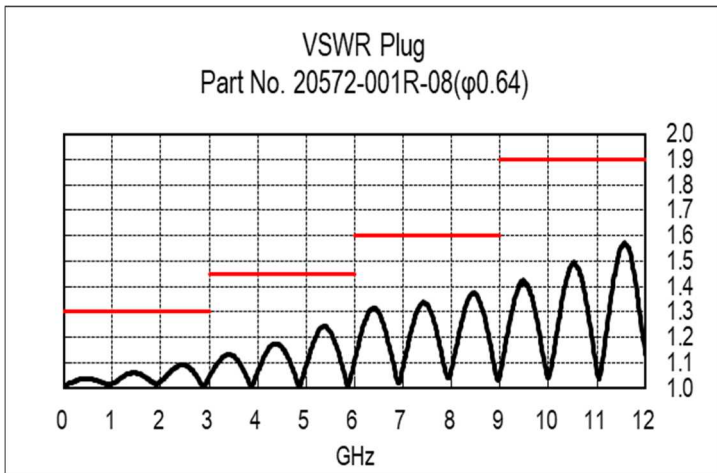
Group	Test items	Measurements	Specification	Number of samples	Unit	AVE.	MAX.	MIN.	S	Judgement	
A	Dielectric withstanding voltage	20572-001R-08(φ0.64)	Spec. : No creeping discharge, flashover, nor insulator breakdown shall occur.								
			-----	10	-----	No abnormality			OK		
B	VSWR Plug	20572-001R-08 (φ0.64)	0.1~3GHz	1.3 MAX.	10	-----	1.131	1.15	1.12	0.007	OK
			3~6GHz	1.45 MAX.	10	-----	1.246	1.26	1.22	0.012	OK
			6~9GHz	1.6 MAX.	10	-----	1.367	1.40	1.34	0.016	OK
			9~12GHz	1.9 MAX.	10	-----	1.514	1.56	1.45	0.025	OK
	VSWR Receptacle	20449-001E-**	0.1~3GHz	1.3 MAX.	10	-----	1.114	1.15	1.08	0.027	OK
			3~6GHz	1.4 MAX.	10	-----	1.138	1.15	1.12	0.009	OK
			6~9GHz	1.5 MAX.	10	-----	1.356	1.41	1.31	0.038	OK
C	Mating force	20572-001R-08 (φ0.64)	Initial	30 MAX.	10	N	21.60	22.8	20.1	1.02	OK
			30 cycles		10	N	7.21	7.7	6.7	0.41	OK
	Unmating force	20572-001R-08 (φ0.64)	Initial	20 MAX. 5 MIN.	10	N	11.56	13.2	10.9	0.94	OK
			30 cycles	20 MAX. 3 MIN.	10	N	7.58	8.9	6.4	1.05	OK
D	Crimp strength	20572-001R-08(φ0.64)	8 MIN.	10	N	13.69	14.3	13.3	0.30	OK	
E	Durability	20572-001R-08 (φ0.64)	Contact resistance of inner contact								
			Initial	20 MAX.	10	mΩ	11.50	13.4	10.1	1.27	OK
			After testing	-----	10	mΩ	11.94	14.9	9.5	1.62	-----
			ΔR	20 MAX.	10	mΩ	0.44	3.6	-1.5	1.72	OK
			Contact resistance of ground contact								
			Initial	20 MAX.	10	mΩ	5.05	5.9	4.5	0.48	OK
			After testing	-----	10	mΩ	6.69	7.1	6.0	0.39	-----
			ΔR	20 MAX.	10	mΩ	1.63	2.7	0.4	0.69	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				
F	Vibration	20572-001R-08 (φ0.64)	Contact resistance of inner contact								
			Initial	20 MAX.	10	mΩ	12.23	13.8	10.6	0.94	OK
			After testing	-----	10	mΩ	12.04	14.9	10.2	1.48	-----
			ΔR	20 MAX.	10	mΩ	-0.19	1.6	-1.7	1.36	OK
			Contact resistance of ground contact								
			Initial	20 MAX.	10	mΩ	6.98	7.6	6.0	0.47	OK
			After testing	-----	10	mΩ	8.50	9.9	7.5	0.84	-----
			ΔR	20 MAX.	10	mΩ	1.51	2.9	0.3	0.81	OK
			Electrical discontinuity								
			Spec. : No electrical discontinuity grater than 1μsec. shall occur.								
-----		10	-----	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				

Table 2-2 Test result

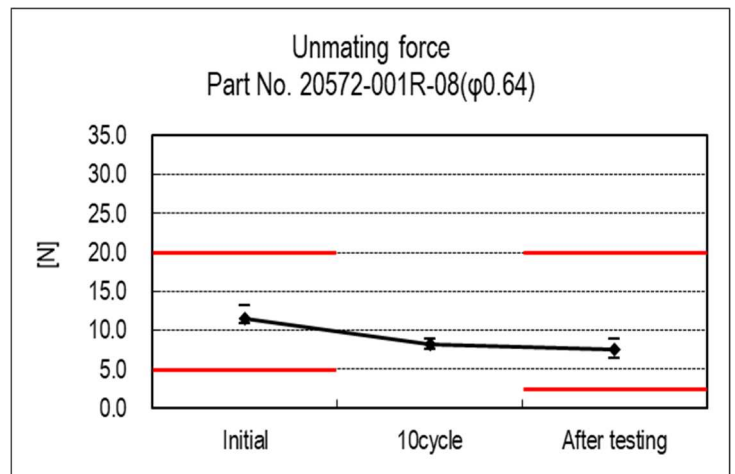
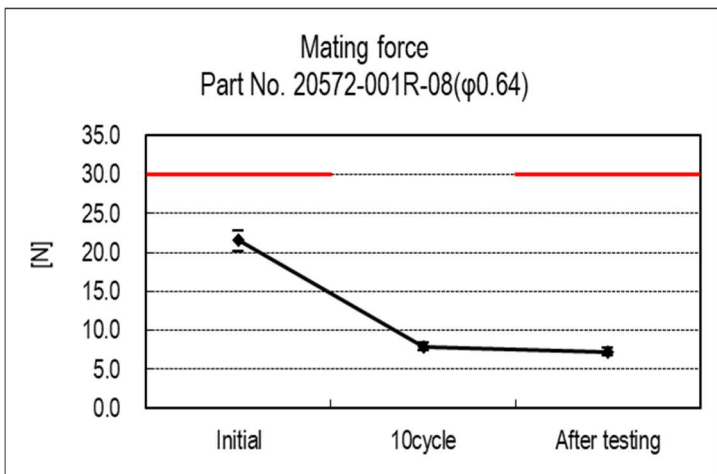
Group	Test items	Measurements	Specification	Number of samples	Unit	AVE.	MAX.	MIN.	S	Judgement
G	Shock 20572-001R-08 (ϕ 0.64)	Contact resistance of inner contact								
		Initial	20 MAX.	10	m Ω	11.84	13.8	10.5	1.12	OK
		After testing	-----	10	m Ω	11.89	13.7	9.5	1.48	-----
		Δ R	20 MAX.	10	m Ω	0.05	2.3	-1.6	1.21	OK
		Contact resistance of ground contact								
		Initial	20 MAX.	10	m Ω	6.73	7.2	6.0	0.36	OK
		After testing	-----	10	m Ω	8.02	8.9	7.3	0.47	-----
		Δ R	20 MAX.	10	m Ω	1.29	2.1	0.8	0.47	OK
		Electrical discontinuity								
		Spec. : No electrical discontinuity greater than 1 μ sec. shall occur.								
		-----	10	-----	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				
H	Thermal shock 20572-001R-08 (ϕ 0.64)	Contact resistance of inner contact								
		Initial	20 MAX.	10	m Ω	11.83	13.5	10.7	0.98	OK
		After testing	-----	10	m Ω	12.45	14.7	11.0	1.25	-----
		Δ R	20 MAX.	10	m Ω	0.63	3.0	-1.0	1.62	OK
		Contact resistance of ground contact								
		Initial	20 MAX.	10	m Ω	6.75	7.4	6.2	0.40	OK
		After testing	-----	10	m Ω	9.04	11.0	7.0	1.28	-----
		Δ R	20 MAX.	10	m Ω	2.28	3.6	0.4	1.07	OK
		Insulation resistance								
		Initial	500 MIN.	10	M Ω	10,000 (minimum value)				OK
		After testing	100 MIN.	10	M Ω	10,000 (minimum value)				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				
J	High temperature life 20572-001R-08 (ϕ 0.64)	Contact resistance of inner contact								
		Initial	20 MAX.	10	m Ω	10.68	13.0	9.4	1.06	OK
		After testing	-----	10	m Ω	10.55	12.8	8.8	1.50	-----
		Δ R	20 MAX.	10	m Ω	-0.13	3.0	-1.9	1.49	OK
		Contact resistance of ground contact								
		Initial	20 MAX.	10	m Ω	5.62	7.3	5.1	0.67	OK
		After testing	-----	10	m Ω	8.20	9.5	6.7	0.80	-----
		Δ R	20 MAX.	10	m Ω	2.58	3.7	0.6	0.94	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 result

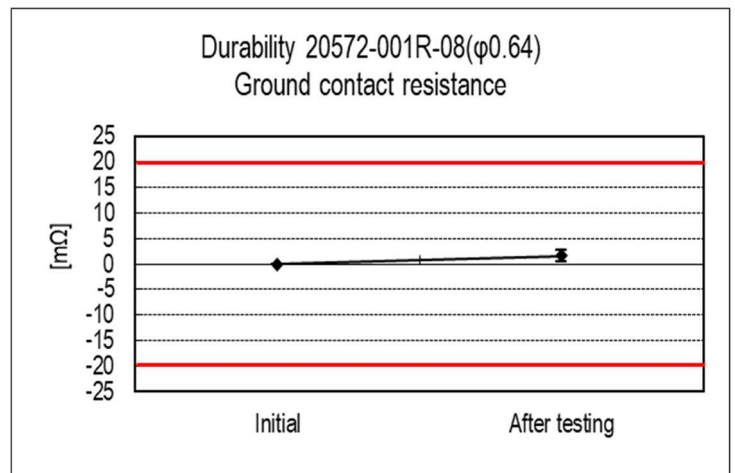
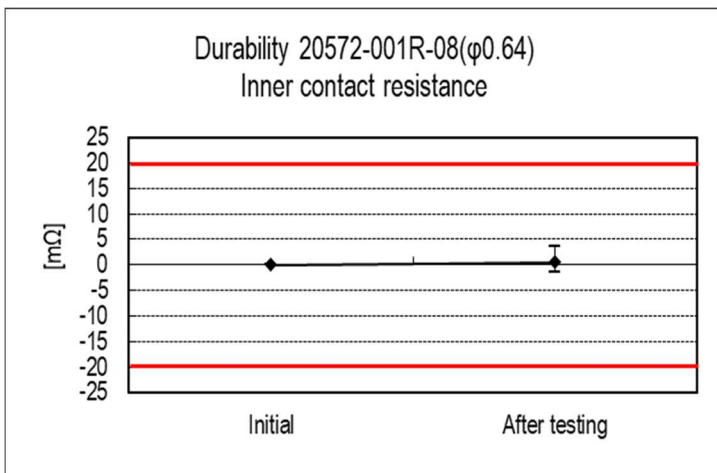
Group	Test items	Measurements	Specification	Number of samples	Unit	AVE.	MAX.	MIN.	S	Judgement		
K	Humidity(Steady state) 20572-001R-08 (ϕ 0.64)	Contact resistance of inner contact										
		Initial	20 MAX.	10	m Ω	12.46	13.7	10.7	1.05	OK		
		After testing	-----	10	m Ω	12.36	14.9	10.5	1.34	-----		
		Δ R	20 MAX.	10	m Ω	-0.11	1.9	-1.8	1.39	OK		
		Contact resistance of ground contact										
		Initial	20 MAX.	10	m Ω	6.47	6.9	6.2	0.26	OK		
		After testing	-----	10	m Ω	7.73	8.5	7.1	0.48	-----		
		Δ R	20 MAX.	10	m Ω	1.27	1.9	0.7	0.45	OK		
		Insulation resistance										
		Initial	500 MIN.	10	M Ω	10,000 (minimum value)					OK	
		After testing	100 MIN.	10	M Ω	10,000 (minimum value)					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			
L	Saltwater spray 20572-001R-08 (ϕ 0.64)	Contact resistance of inner contact										
		Initial	20 MAX.	10	m Ω	12.00	13.8	10.3	1.20	OK		
		After testing	-----	10	m Ω	11.74	14.5	10.3	1.47	-----		
		Δ R	20 MAX.	10	m Ω	-0.26	1.8	-2.0	1.17	OK		
		Contact resistance of ground contact										
		Initial	20 MAX.	10	m Ω	7.21	7.8	6.8	0.35	OK		
		After testing	-----	10	m Ω	10.03	11.6	8.5	0.97	-----		
		Δ R	20 MAX.	10	m Ω	2.82	3.9	1.6	0.95	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	H2S Gas 20572-001R-08 (ϕ 0.64)	Contact resistance of inner contact								
				Initial	20 MAX.	10	m Ω	12.48	14.9	10.6	1.18	OK
After testing	-----			10	m Ω	12.99	14.7	11.1	1.40	-----		
Δ R	20 MAX.			10	m Ω	0.51	2.6	-1.2	1.31	OK		
Contact resistance of ground contact												
Initial	20 MAX.			10	m Ω	7.32	8.1	6.4	0.47	OK		
After testing	-----			10	m Ω	9.17	10.1	8.2	0.66	-----		
Δ R	20 MAX.			10	m Ω	1.86	3.1	0.7	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	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%.								
				-----	10	-----	No abnormality					OK
P	Reflow soldering heat resistance	Spec. : Abnormality adversely affecting the performance should not occur.										
		-----	10	-----	No abnormality					OK		



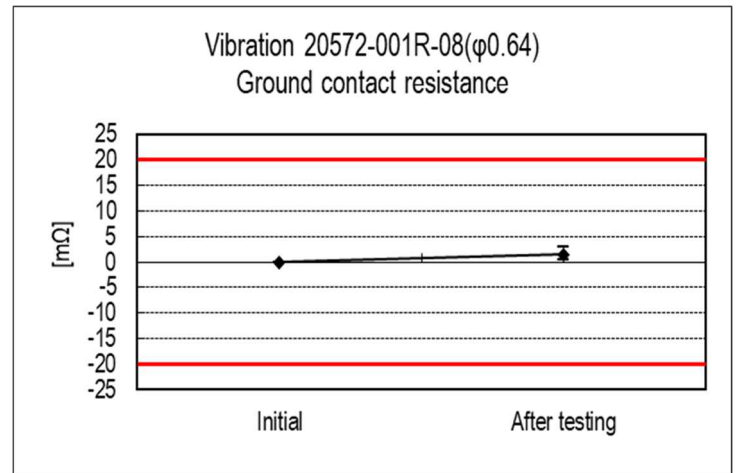
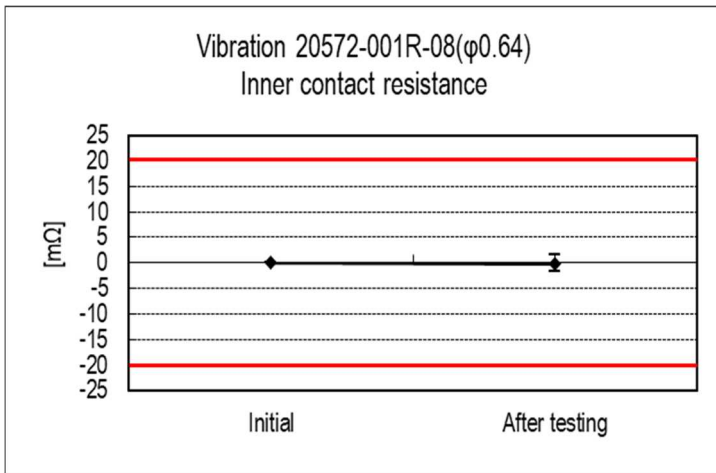
Graph 1 VSWR



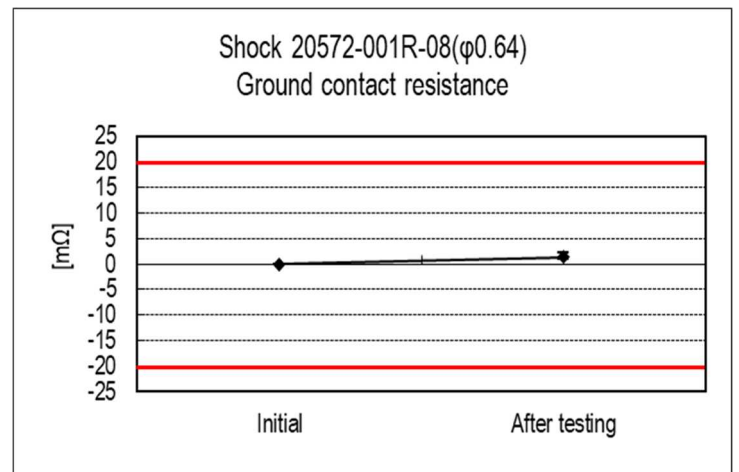
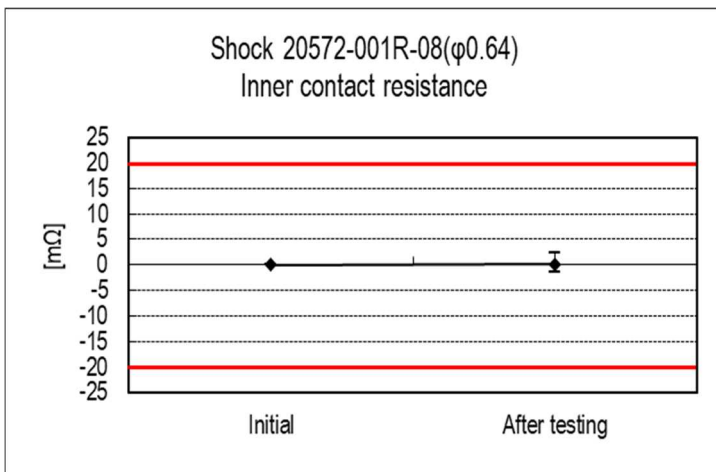
Graph 2 Mating force / Unmating force



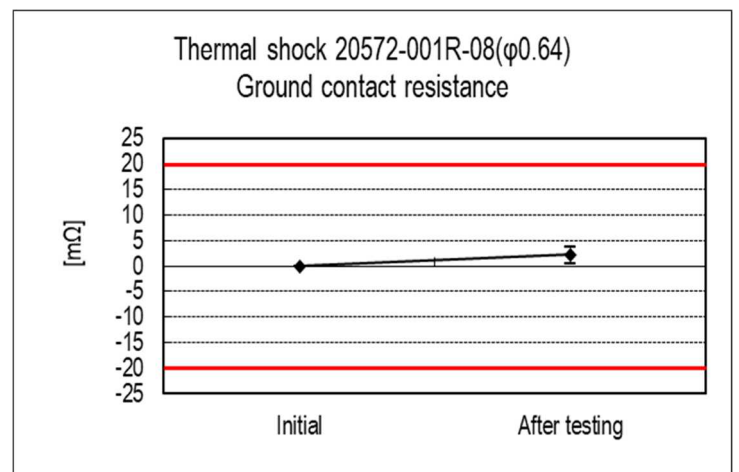
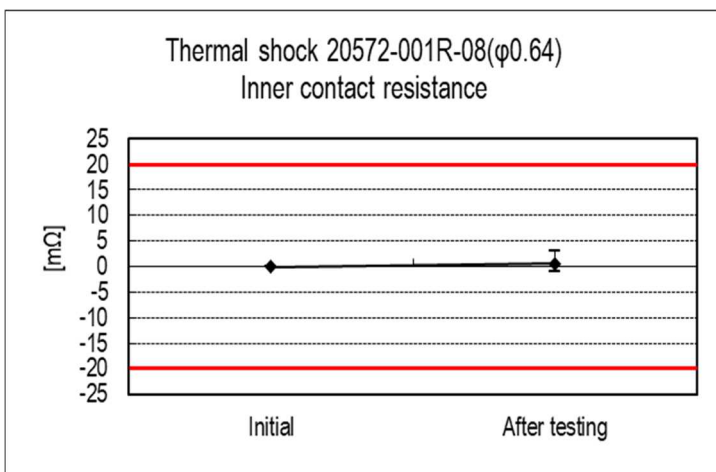
Graph 3 Durability



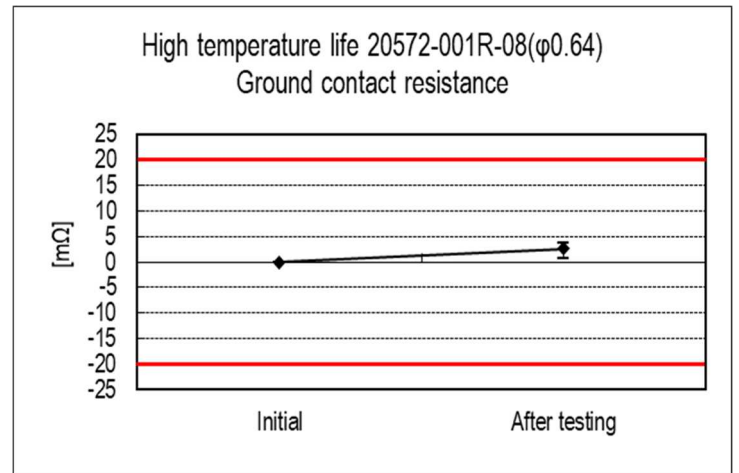
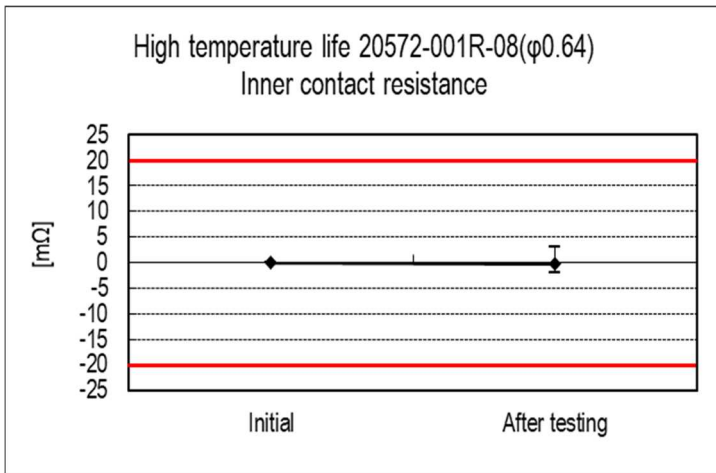
Graph 4 Vibration



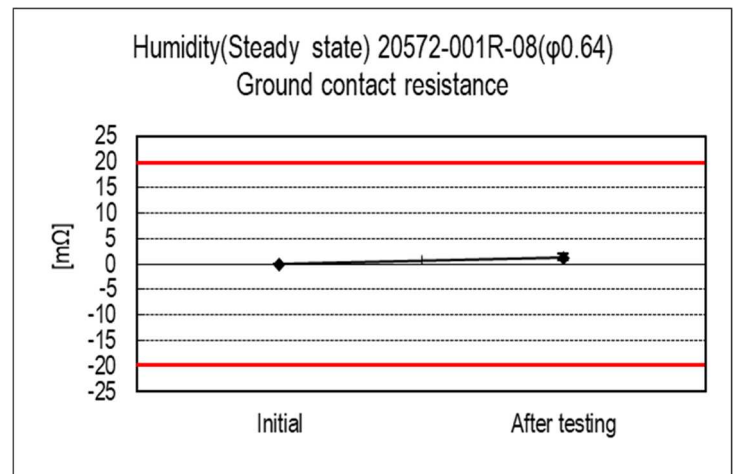
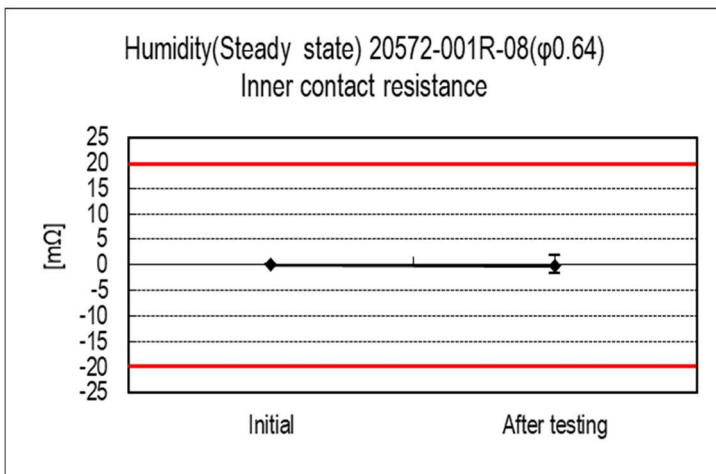
Graph 5 Shock



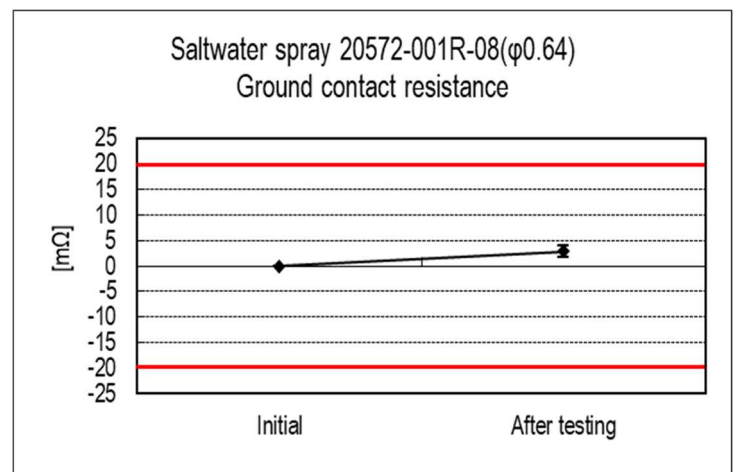
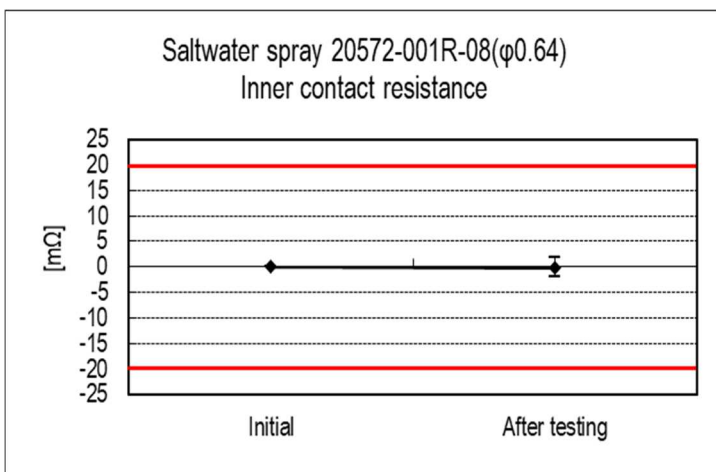
Graph 6 Thermal shock



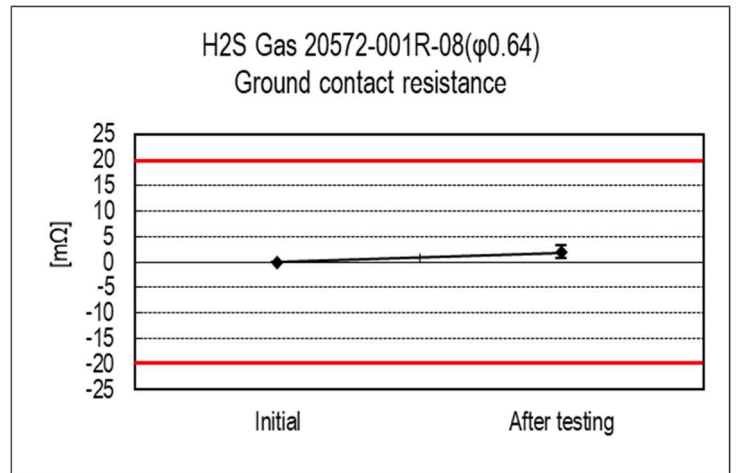
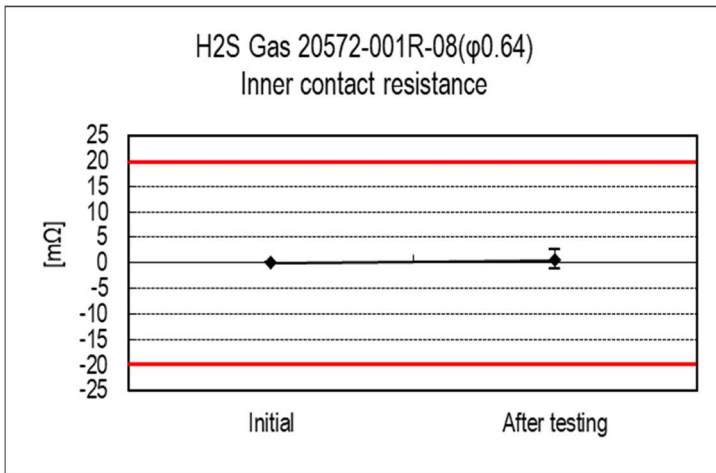
Graph 7 High temperature life



Graph 8 Humidity(Steady state)



Graph 9 Saltwater spray



Graph 10 H2S Gas