

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

Part No. MHF 4L Plug: 20572-001R-08 MHF 4 Receptacle: 20449-001E-**

Test Report

Product Specification no. PRS-1944

5	T22078	May 31, 2022	K.Watanabe	K.Yufu	Y.Hashimoto
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
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

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

2. Specimen

- (1) MHF 4L PLUG ASS'Y (Part No. 20572-001R-08)
- (2) MHF 4 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	
Specimen Quantity (pcs.)	Plug	10	10	10	10	10	10	-	10	10	10	10	10	-	-
	Receptacle		5		-			10						10	10

※Numbers indicate test sequences

Table 2-1 Test result

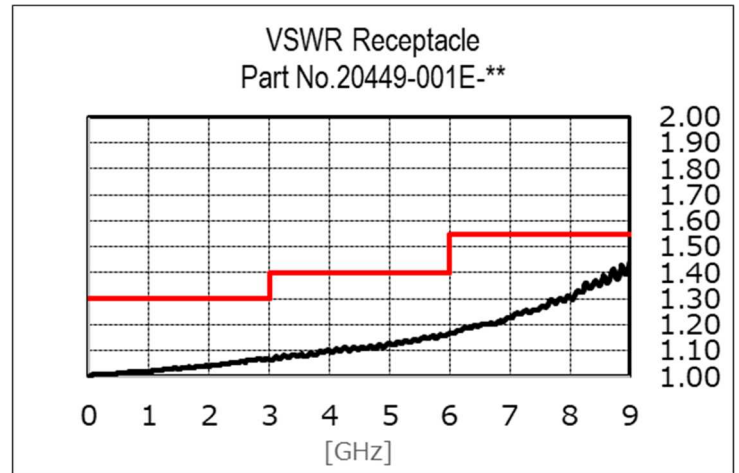
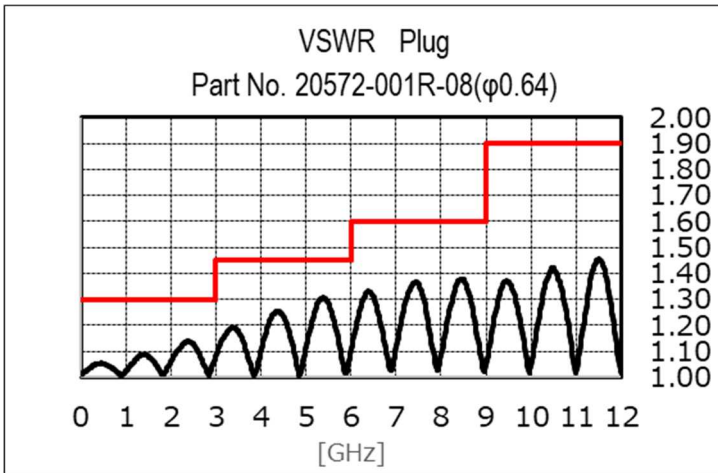
Group	Test items	Measurements	Specification	Number of samples	Unit	AVE.	MAX.	MIN.	S	Judgement	
A	Dielectric withstanding voltage	20572-001R-08(φ0.64)	Spec. : No creeping discharge, flashover, nor insulator breakdown shall occur.								
				10		No abnormality				OK	
B	VSWR Plug	20572-001R-08 (φ0.64)	0.1~3GHz	1.30 MAX.	10	-----	1.134	1.15	1.12	0.007	OK
			3~6GHz	1.45 MAX.	10	-----	1.302	1.32	1.28	0.013	OK
			6~9GHz	1.60 MAX.	10	-----	1.378	1.41	1.32	0.022	OK
			9~12GHz	1.90 MAX.	10	-----	1.465	1.53	1.39	0.038	OK
	VSWR Receptacle	20449-001E-**	0.1~3GHz	1.30 MAX.	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	0.021	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

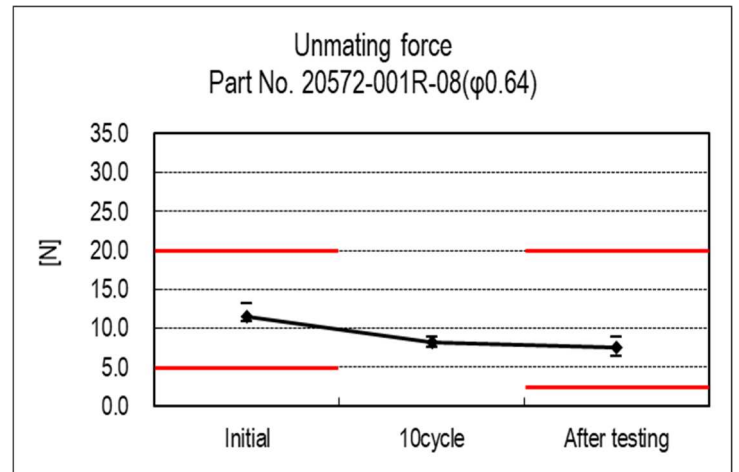
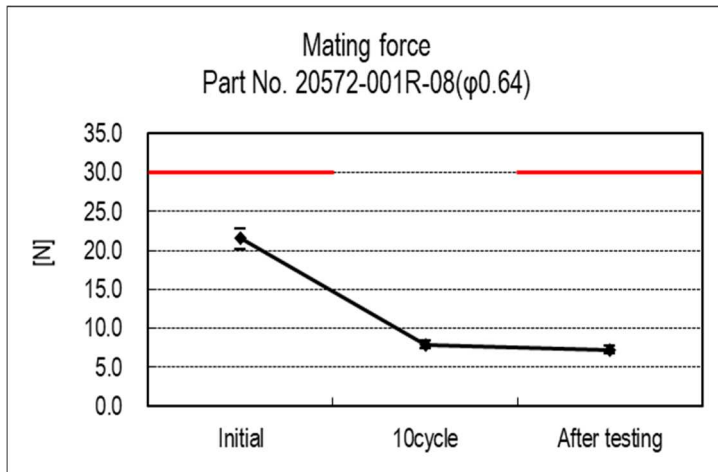
Group	Test items	Measurements	Specification	Number of samples	Unit	AVE.	MAX.	MIN.	S	Judgement				
G	Shock 20572-001R-08 (φ0.64)	Contact resistance of inner contact		Initial	20 MAX.	10	mΩ	11.84	13.8	10.5	1.12	OK		
		After testing	-----	10	mΩ	11.89	13.7	9.5	1.48	-----				
		ΔR	20 MAX.	10	mΩ	0.05	2.3	-1.6	1.21	OK				
		Contact resistance of ground contact		Initial	20 MAX.	10	mΩ	6.73	7.2	6.0	0.36	OK		
		After testing	-----	10	mΩ	8.02	8.9	7.3	0.47	-----				
		ΔR	20 MAX.	10	mΩ	1.29	2.1	0.8	0.47	OK				
		Electrical discontinuity		Spec. : No electrical discontinuity greater 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			
		H	Thermal shock 20572-001R-08 (φ0.64)	Contact resistance of inner contact		Initial	20 MAX.	10	mΩ	11.83	13.5	10.7	0.98	OK
				After testing	-----	10	mΩ	12.45	14.7	11.0	1.25	-----		
				ΔR	20 MAX.	10	mΩ	0.63	3.0	-1.0	1.62	OK		
Contact resistance of ground contact				Initial	20 MAX.	10	mΩ	6.75	7.4	6.2	0.40	OK		
After testing	-----			10	mΩ	9.04	11.0	7.0	1.28	-----				
ΔR	20 MAX.			10	mΩ	2.28	3.6	0.4	1.07	OK				
Insulation resistance				Initial	500 MIN.	10	MΩ	10,000 (minimum value)				OK		
After testing	100 MIN.			10	MΩ	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 (φ0.64)			Contact resistance of inner contact		Initial	20 MAX.	10	mΩ	10.68	13.0	9.4	1.06	OK
		After testing	-----	10	mΩ	10.55	12.8	8.8	1.50	-----				
		ΔR	20 MAX.	10	mΩ	-0.13	3.0	-1.9	1.49	OK				
		Contact resistance of ground contact		Initial	20 MAX.	10	mΩ	5.62	7.3	5.1	0.67	OK		
		After testing	-----	10	mΩ	8.20	9.5	6.7	0.80	-----				
		ΔR	20 MAX.	10	mΩ	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

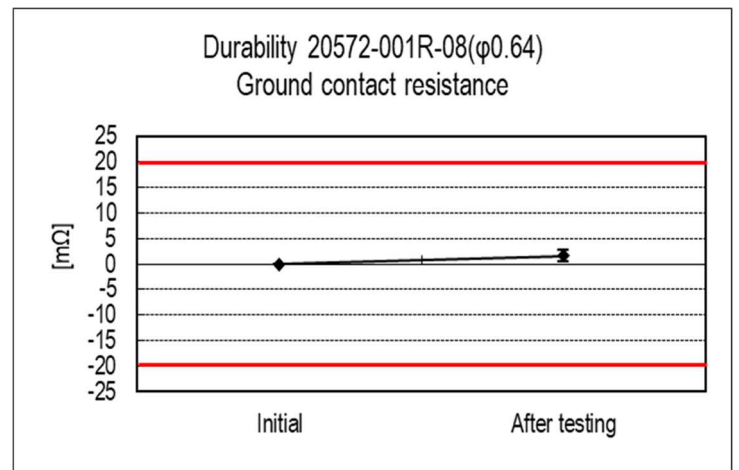
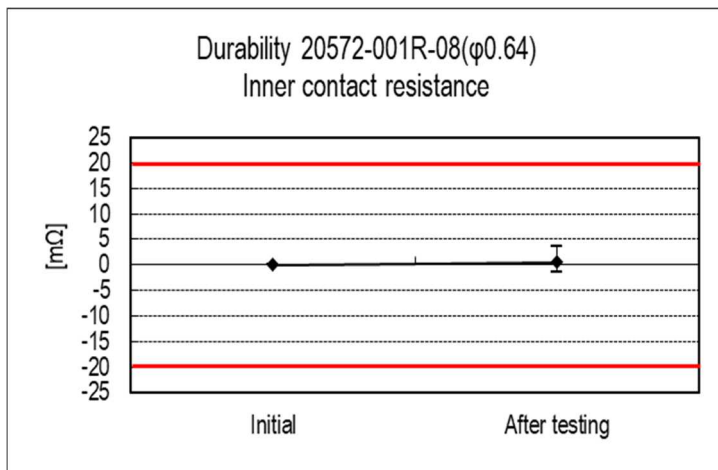
Group	Test items	Measurements	Specification	Number of samples	Unit	AVE.	MAX.	MIN.	S	Judgement		
K	Humidity(Steady state) 20572-001R-08 (φ0.64)	Contact resistance of inner contact										
		Initial	20 MAX.	10	mΩ	12.46	13.7	10.7	1.05	OK		
		After testing	-----	10	mΩ	12.36	14.9	10.5	1.34	-----		
		ΔR	20 MAX.	10	mΩ	-0.11	1.9	-1.8	1.39	OK		
		Contact resistance of ground contact										
		Initial	20 MAX.	10	mΩ	6.47	6.9	6.2	0.26	OK		
		After testing	-----	10	mΩ	7.73	8.5	7.1	0.48	-----		
		ΔR	20 MAX.	10	mΩ	1.27	1.9	0.7	0.45	OK		
		Insulation resistance										
		Initial	500 MIN.	10	MΩ	10,000 (minimum value)					OK	
		After testing	100 MIN.	10	MΩ	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 (φ0.64)	Contact resistance of inner contact										
		Initial	20 MAX.	10	mΩ	12.00	13.8	10.3	1.20	OK		
		After testing	-----	10	mΩ	11.74	14.5	10.3	1.47	-----		
		ΔR	20 MAX.	10	mΩ	-0.26	1.8	-2.0	1.17	OK		
		Contact resistance of ground contact										
		Initial	20 MAX.	10	mΩ	7.21	7.8	6.8	0.35	OK		
		After testing	-----	10	mΩ	10.03	11.6	8.5	0.97	-----		
		ΔR	20 MAX.	10	mΩ	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 (φ0.64)	Contact resistance of inner contact								
				Initial	20 MAX.	10	mΩ	12.48	14.9	10.6	1.18	OK
After testing	-----			10	mΩ	12.99	14.7	11.1	1.40	-----		
ΔR	20 MAX.			10	mΩ	0.51	2.6	-1.2	1.31	OK		
Contact resistance of ground contact												
Initial	20 MAX.			10	mΩ	7.32	8.1	6.4	0.47	OK		
After testing	-----			10	mΩ	9.17	10.1	8.2	0.66	-----		
ΔR	20 MAX.			10	mΩ	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				
P	Reflow soldering heat resistance	Spec. : Abnormality adversely affecting the performance should not occur.										
		-----		10	-----	No abnormality					OK	



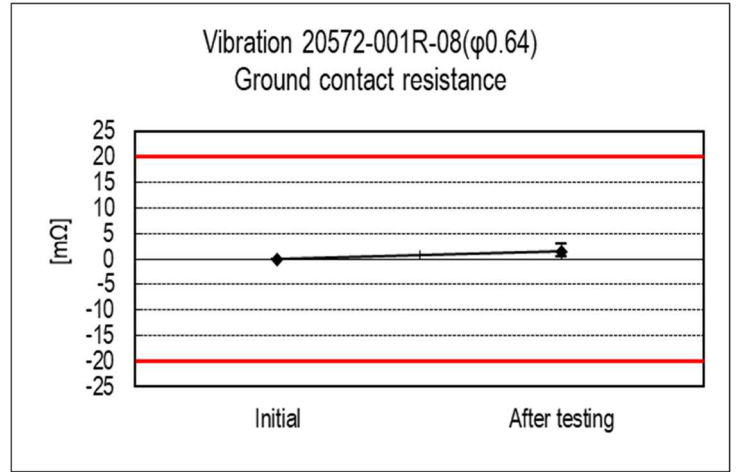
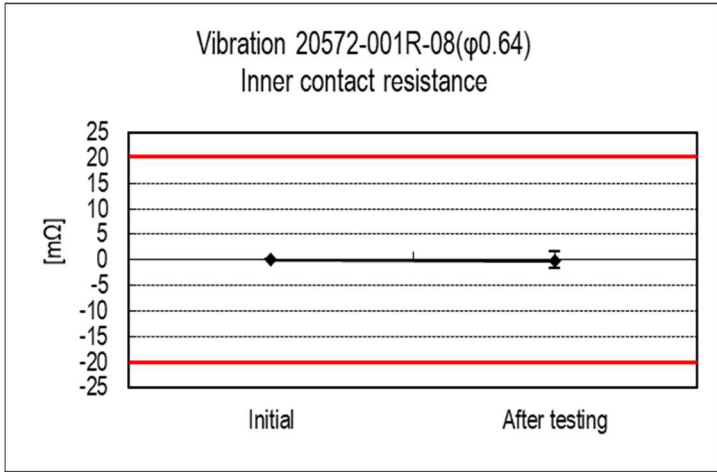
Graph 1 VSWR



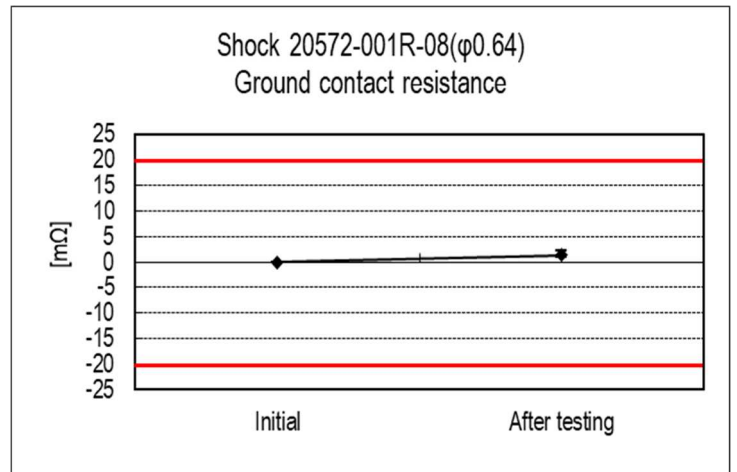
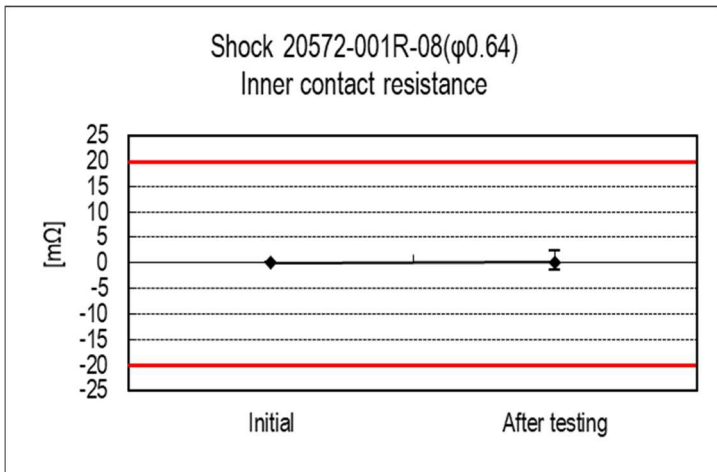
Graph 2 Mating force / Unmating force



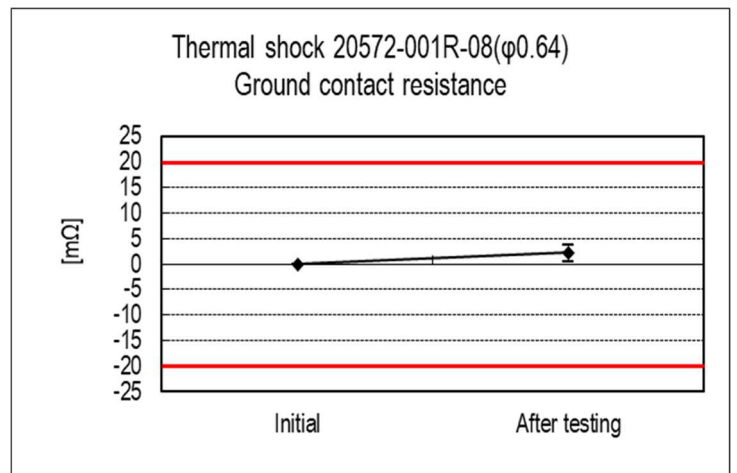
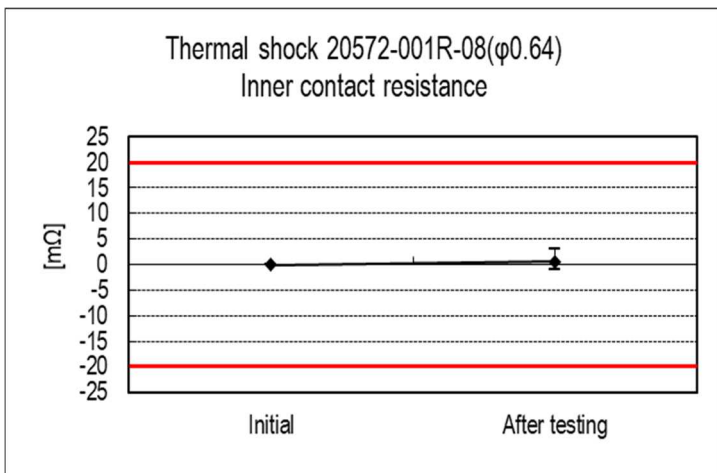
Graph 3 Durability



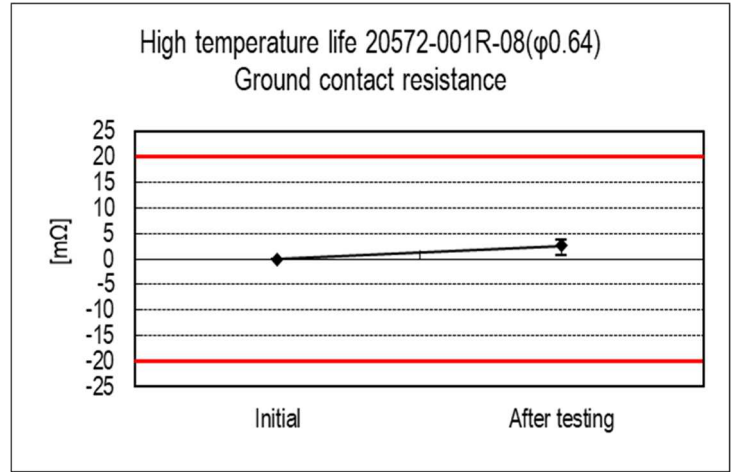
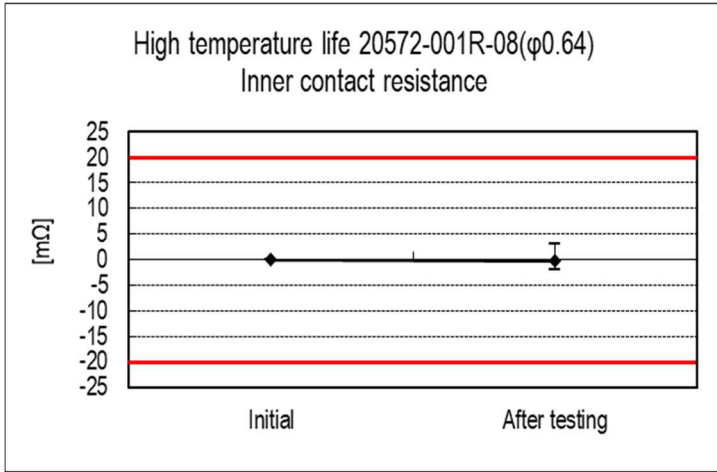
Graph 4 Vibration



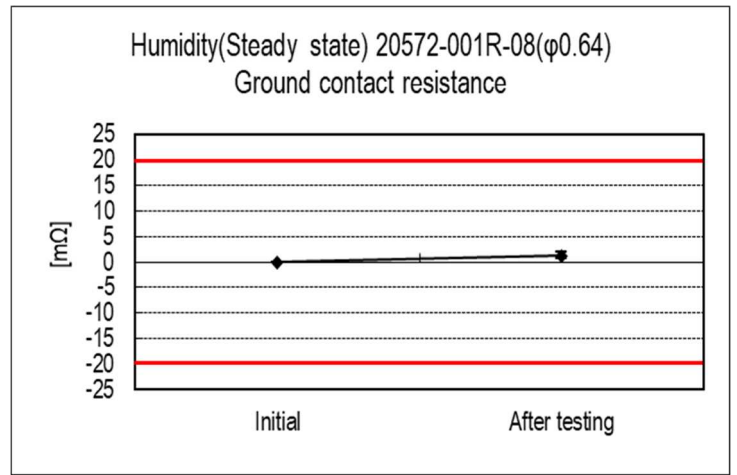
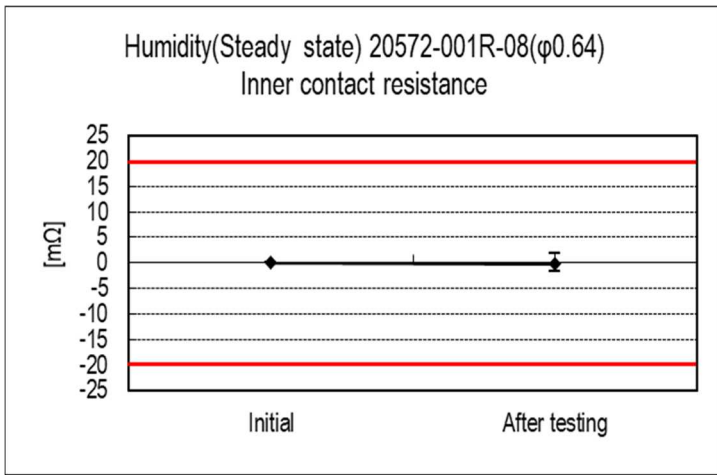
Graph 5 Shock



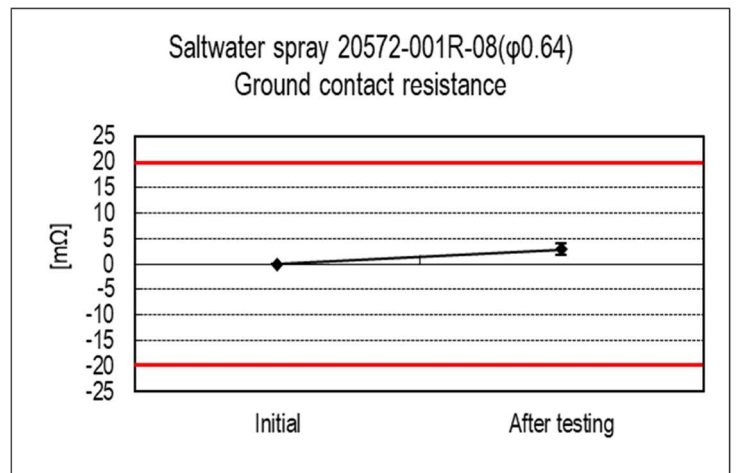
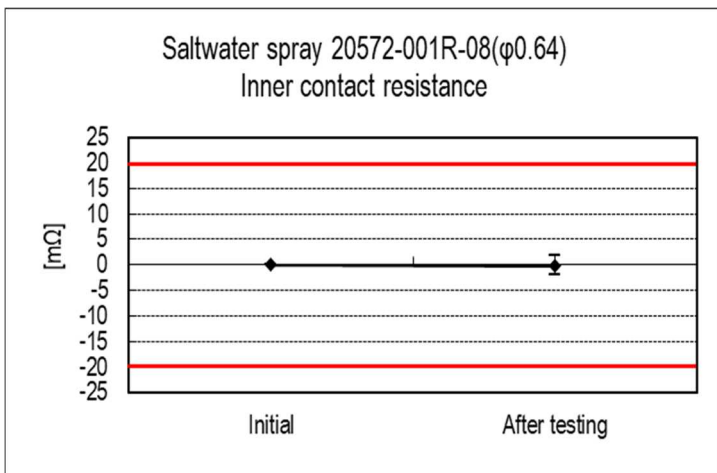
Graph 6 Thermal shock



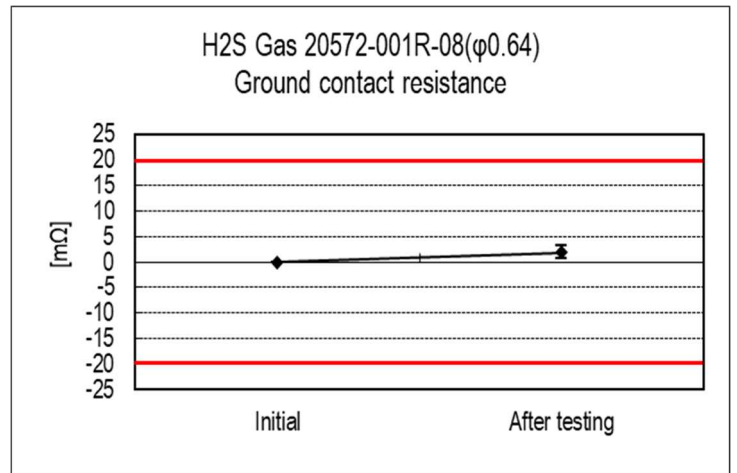
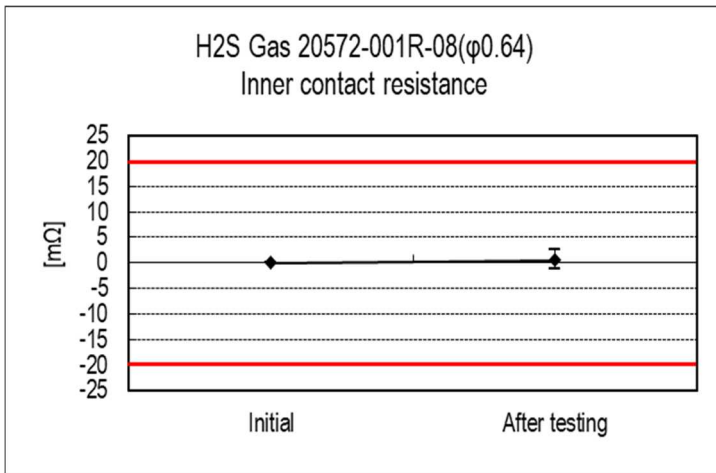
Graph 7 High temperature life



Graph 8 Humidity(Steady state)



Graph 9 Saltwater spray



Graph 10 H2S Gas