CABLINE®-VS

Part No. Plug : 20453-2**T-### Receptacle : 20455-#**E-#6#

Test Report

Product Specification no. PRS-1427

Rev.	ECN	Date	Prepared by	Checked by	Approved by
7	T24027	May 30, 2024	T.Ono	M.Nakamura	T.Masunaga
6	T21124	October 29, 2021	R.Morita	T.Masunaga	H.Ikari
5	T18073	July 2, 2018	A.Koyanagi	T.Masunaga	H.Ikari
4	T15081	Sept. 29 2015	H.Ikari	-	Y.Shimada

1. Purpose

To evaluate the performance of CABLINE-VS Connector in accordance with PRS-1427.

2. Specimen

(1) CABLINE-VS PLUG CABLE ASSEMBLY （Part No. 20453-2**T-###）
(2) CABLINE-VS RECEPTACLE ASSEMBLY （Part No. 20455-#**E-#6#）

3. Test Sequence

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

4. Result

See Table 2-1 to 2-4, Graph 1 to 18. For the details of the testing conditions and requirements, see PRS-1427.
The “n” in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-1427.

Table.1 Test Sequence and Sample Quantity

No.		Test Item	Testing Groups											
			A	B	C	D	E	F	G	H	J	K	L	M
4.1 Electrical Performance	1	Contact Resistance	2,6		1,3,5	1,3	1,3	1,5	1,5,7	1,3	1,3			
	2	Insulation Resistance						2,6	2,8					
	3	Dielectric Withstanding Voltage						3,7	3,9					
	4	Temperature Rising												1
4.2 Mechanical Performance	1	Mating Force	1,5											
		Un-mating Force	3,7											
	2	Durability	4						4 (10 cycles)					
	3	Contact Retention Force		1,3										
	4	Cable Retention Force	8											
	5	Vibration			2									
	6	Shock			4									
4.3 Environmental Performance	1	Thermal Shock				2								
	2	High Temperature Life		2			2							
	3	Humidity (Steady State)						4						
	4	Humidity (Cycling)							6					
	5	Saltwater Spray								2				
	6	H_2S Gas									2			
4.4 Others	1	Solder Ability										1		
	2	Soldering Heat Resistance											1	
Specimen Quantity			5 pcs.	20 pos.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	10 pcs.	10 pcs.	5 pcs.

※Numbers indicate test sequences.

Table.2-1 Test Result

Test Item	Contents of Measurement		Specifications	Set	N	Data					Judgment
						AVE.	MAX.	MIN.	s	X±3s	
A Group Durability ↓ Cable Retention Force	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX.	5	200	532.847	543.26	523.81	4.811	547.280	Pass
		After Testing	AWG#40 ΔR=40mΩMAX.			-2.640	0.53	-4.89	1.405	1.575	Pass
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	13.102	13.51	12.70	0.318	14.056	Pass
		After Testing	ΔR=40mΩ MAX.			-0.227	0.32	-0.79	0.368	0.877	Pass
	20P Mating Force (N)	Initial	9.45N MAX.	5	5	6.614	7.19	5.91	0.534	8.216	Pass
		After Testing	9.45N MAX.			4.626	4.96	4.31	0.265	5.421	Pass
	20P Un-mating Force (N)	Initial	2.0N MIN.	5	5	5.262	5.54	4.97	0.209	4.635	Pass
		After Testing	2.0N MIN.			4.472	4.76	4.18	0.235	3.767	Pass
	20P Cable Retention Force (N)		9.8N MIN.	5	5	84.910	92.40	78.00	5.449	68.563	Pass
	30P Mating Force(N)	Initial	12.15N MAX.	5	5	8.280	8.40	8.12	0.140	8.700	Pass
		After Testing	12.15N MAX.			5.781	5.99	5.56	0.219	6.438	Pass
	30P Un-mating Force (N)	Initial	3.0N MIN.	5	5	6.540	6.82	6.40	0.241	5.817	Pass
		After Testing	3.0N MIN.			5.332	5.48	5.21	0.135	4.927	Pass
	30P Cable Retention Force (N)		14.7N MIN.	5	5	84.227	92.28	76.40	7.942	60.401	Pass
	40P Mating Force (N)	Initial	16.2N MAX.	5	5	10.917	11.82	10.11	0.859	13.494	Pass
		After Testing	16.2N MAX.			7.928	8.45	7.53	0.470	9.338	Pass
	40P Un-mating Force (N)	Initial	4.0N MIN.	5	5	9.126	9.93	8.39	0.770	6.816	Pass
		After Testing	4.0N MIN.			8.005	8.39	7.43	0.505	6.490	Pass
	40P Cable Retention Force (N)		19.6N MIN.	5	5	86.280	91.82	79.12	5.020	71.220	Pass
	50P Mating Force (N)	Initial	20.25N MAX.	5	5	13.418	14.22	12.55	0.741	15.641	Pass
		After Testing	20.25N MAX.			9.820	10.43	9.21	0.461	11.203	Pass
	50P Un-mating Force (N)	Initial	5.0N MIN.	5	5	11.928	12.68	11.18	0.622	10.062	Pass
		After Testing	5.0N MIN.			9.886	10.56	9.23	0.491	8.413	Pass
	50P Cable Retention Force (N)		24.50N MIN.	5	5	107.700	115.20	100.34	5.630	90.810	Pass
B Group High Temp. Life	Receptacle Contact Retention Force (N)	Initial	0.2N MIN.	—	20	0.775	0.99	0.62	0.087	0.514	Pass
		After Testing	0.2N MIN.	—	20	0.748	0.95	0.61	0.089	0.481	Pass

Table.2-2 Test Result

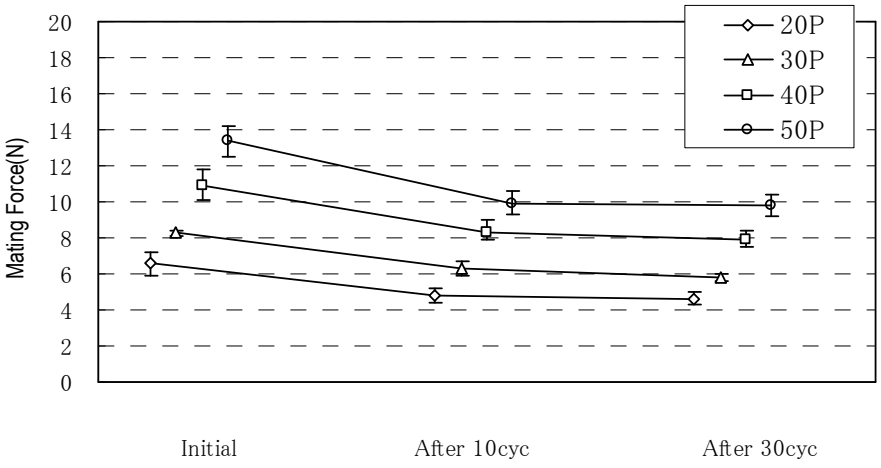
Test Item	Contents of Measurement		Specifications	Set	N	Data AVE.	Data MAX.	Data MIN.	Data s	Data X±3s	Judgment
C Group Vibration ↓ Shock	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX.	5	200	532.522	536.16	528.75	1.676	537.550	Pass
		After Vibration	AWG#40 ΔR=40mΩMAX.			-0.334	2.40	-3.20	1.164	3.158	Pass
		After Shock	AWG#40 ΔR=40mΩMAX.			-1.295	1.28	-3.56	1.058	1.879	Pass
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	13.707	14.22	12.98	0.456	15.075	Pass
		After Vibration	ΔR=40mΩMAX.			0.228	1.09	-0.38	0.605	2.043	Pass
		After Shock	ΔR=40mΩMAX.			0.127	0.39	-0.14	0.188	0.691	Pass
	Electrical discontinuity	During Vibration	1μsec. MAX.	5	5	No Electrical discontinuity					Pass
		During Shock				No Electrical discontinuity					Pass
	Appearance	After Vibration	No abnormality adversely affecting the performance shall occur.	5	5	No Abnormality					Pass
		After Shock				No Abnormality					Pass
D Group Thermal Shock	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX.	5	200	531.509	535.33	528.57	1.441	535.832	Pass
		After Testing	AWG#40 ΔR=40mΩMAX.			0.735	3.20	-1.95	1.185	4.290	Pass
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	14.145	14.49	13.77	0.256	14.913	Pass
		After Testing	ΔR=40mΩMAX.			0.295	1.21	-0.28	0.574	2.017	Pass
	Appearance		No abnormality adversely affecting the performance shall occur.	5	5	No Abnormality					Pass
E Group High Temp. Life	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX	5	200	530.851	535.34	526.32	2.238	537.565	Pass
		After Testing	AWG#40 ΔR=40mΩMAX.			1.644	4.42	-1.26	1.387	5.805	Pass
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	13.778	14.55	13.35	0.443	15.107	Pass
		After Testing	ΔR=40mΩMAX.			0.245	0.77	-0.29	0.429	1.532	Pass
	Appearance		No abnormality adversely affecting the performance shall occur.	5	5	No Abnormality					Pass

Table.2-3 Test Result

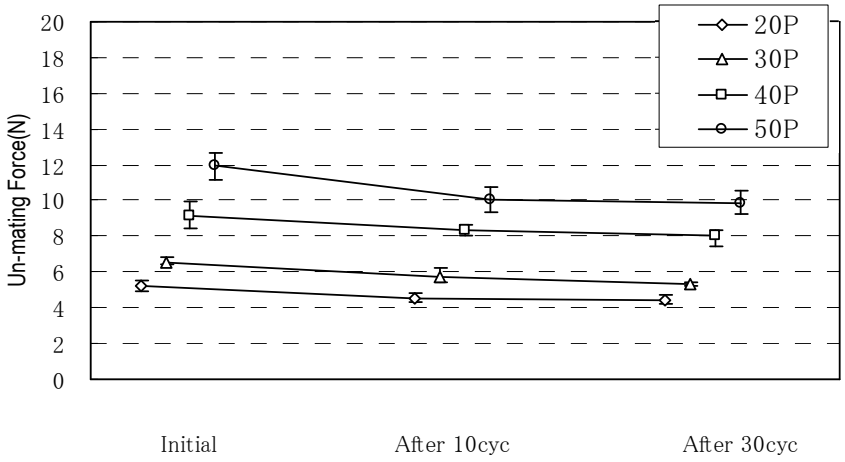
Test Item	Contents of Measurement		Specifications	Set	N	Data AVE.	Data MAX.	Data MIN.	Data s	Data X±3s	Judgment
F Group Humidity (Steady State)	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX	5	200	529.701	534.02	523.83	2.264	536.493	Pass
		After Testing	AWG#40 ΔR=40mΩMAX.			0.044	3.51	-2.89	1.259	3.821	Pass
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	14.545	15.51	13.82	0.598	16.339	Pass
		After Testing	ΔR=40mΩMAX.			-0.113	1.71	-1.29	1.034	2.989	Pass
	Insulation Resistance (MΩ)	Initial	1000MΩMIN.	5	100	2.4×10^5 MΩMIN.					Pass
		After Testing	500MΩMIN.			1.6×10^5 MΩMIN.					Pass
	D. W. Voltage	Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur.	5	100	No Abnormality					Pass
		After Testing				No Abnormality					Pass
G Group Humidity (Cycling)	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX.	5	200	532.626	535.91	529.20	1.548	537.270	Pass
		After Testing	AWG#40 ΔR=40mΩMAX.			-2.158	1.69	-4.78	1.467	2.243	Pass
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	14.935	15.39	14.46	0.387	16.096	Pass
		After Testing	ΔR=40mΩMAX.			0.893	2.20	-0.18	0.842	3.419	Pass
	Insulation Resistance (MΩ)	Initial	1000MΩMIN.	5	100	2.2×10^5 MΩMIN.					Pass
		After Testing	500MΩMIN.			1.4×10^5 MΩMIN.					Pass
	D. W. Voltage	Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur.	5	100	No Abnormality					Pass
		After Testing				No Abnormality					Pass
H Group Saltwater Spray	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX.	5	200	533.226	538.57	528.67	2.156	539.694	Pass
		After Testing	AWG#40 ΔR=40mΩMAX.			0.138	4.78	-3.82	2.128	6.522	Pass
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	15.012	16.21	14.11	0.891	17.685	Pass
		After Testing	ΔR=40mΩMAX.			0.358	1.63	-0.25	0.691	2.431	Pass
	Appearance		No abnormality adversely affecting the performance shall occur.	5	5	No Abnormality					Pass

Table.2-4 Test Result

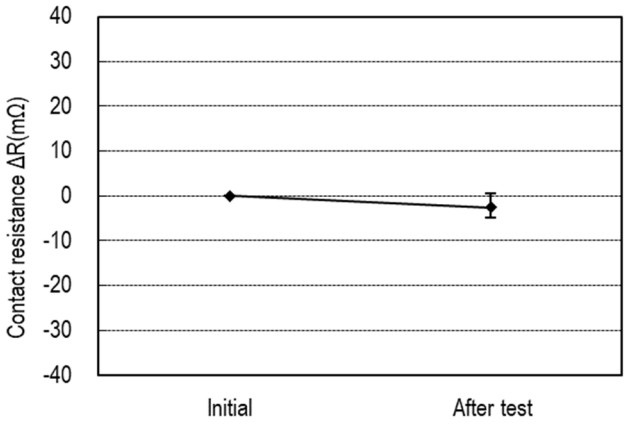
Test Item	Contents of Measurement		Specifications	Set	N	Data					Judgment
						AVE.	MAX.	MIN.	s	X±3s	
J Group H_2S Gas	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX.	5	200	531.289	537.52	525.97	2.593	539.068	Pass
		After testing	AWG#40 ΔR=40mΩMAX.			-1.168	2.26	-4.48	1.608	3.656	Pass
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	14.948	15.88	14.28	0.590	16.718	Pass
		After Testing	ΔR=40mΩMAX.			-0.057	0.50	-0.98	0.583	1.692	Pass
	Appearance		No abnormality adversely affecting the performance shall occur.	5	5	No Abnormality					Pass
K Group Solder Ability	Appearance		More than 95% of the dipped surface shall be evenly wet.	10	10	Wet 95% MIN.					Pass
L Group Soldering Heat Resistance	Appearance		No abnormality adversely affecting the performance shall occur.	10	10	No Abnormality					Pass
M Group Temp. Rising	AWG#40 0.3A(40P)		ΔT=30℃MAX.	5	5	ΔT=28.1℃MAX.					Pass



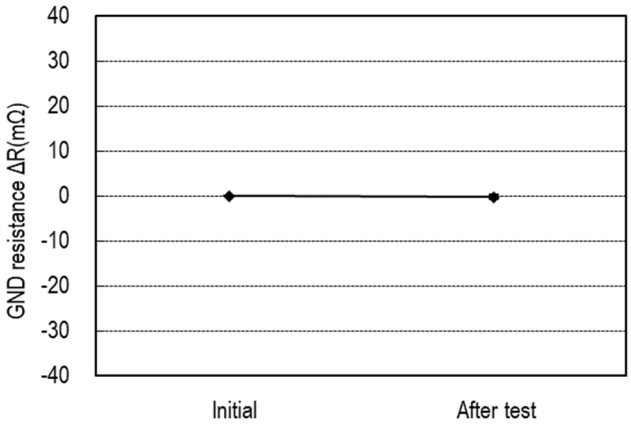
Graph1. A change of mating force (A Group: Durability)



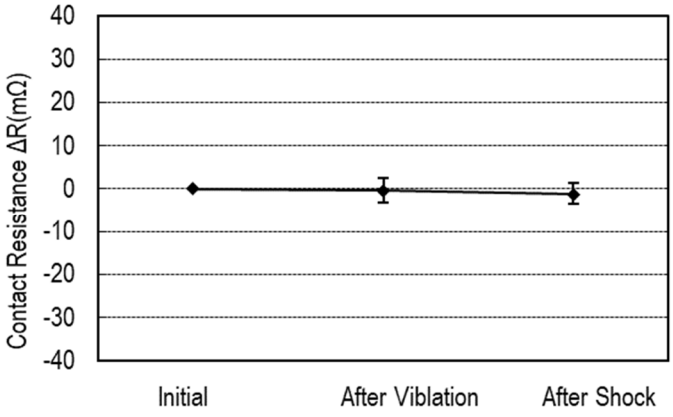
Graph 2. A change of mating force (A Group: Durability)



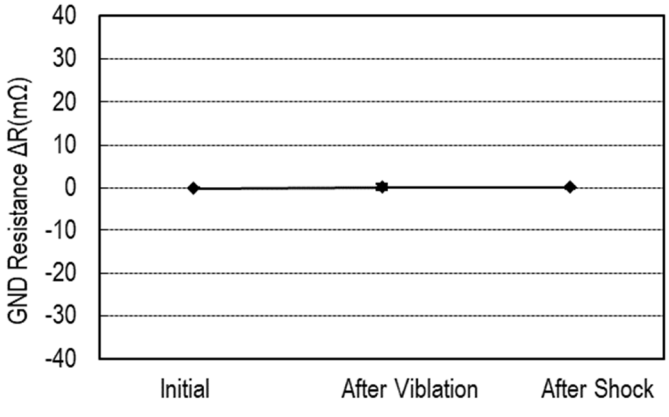
Graph3. A change of contact resistance (A Group: Durability)



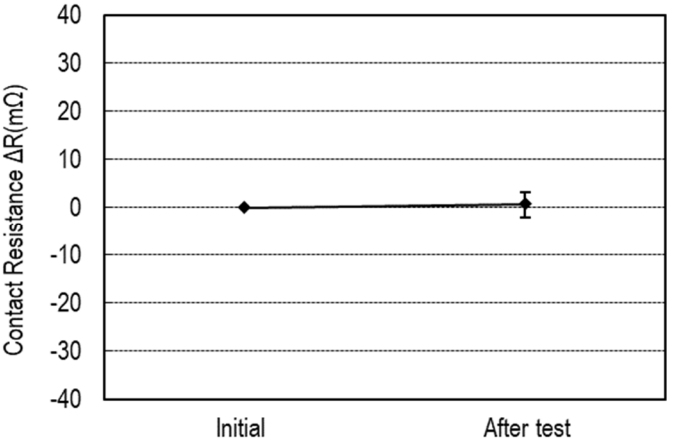
Graph4. A change of GND resistance (A Group: Durability)



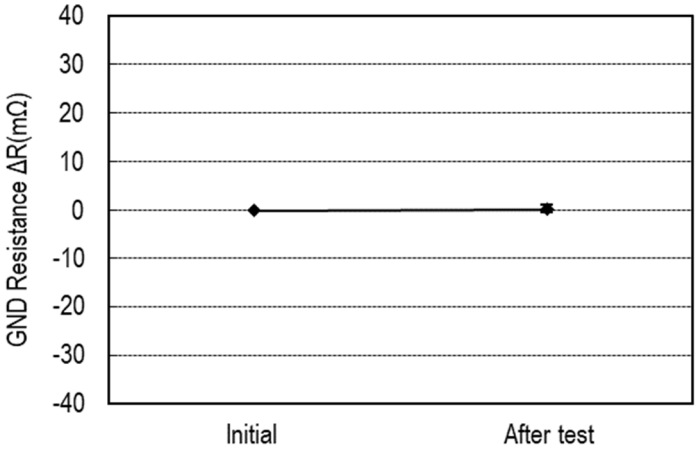
Graph5. A change of contact resistance(C Group: Vibration/Shock)



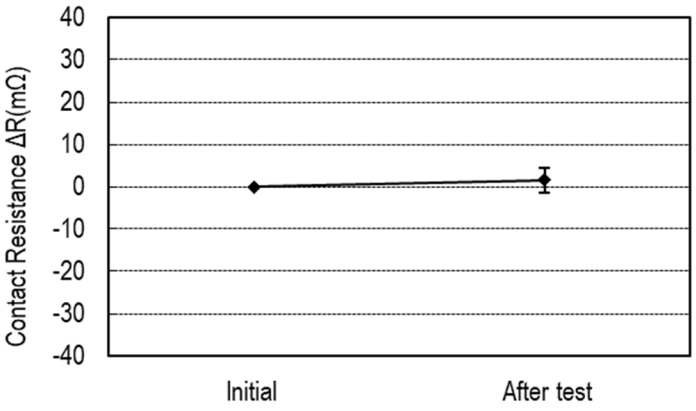
Graph6. A change of GND resistance(C Group: Vibration/Shock)



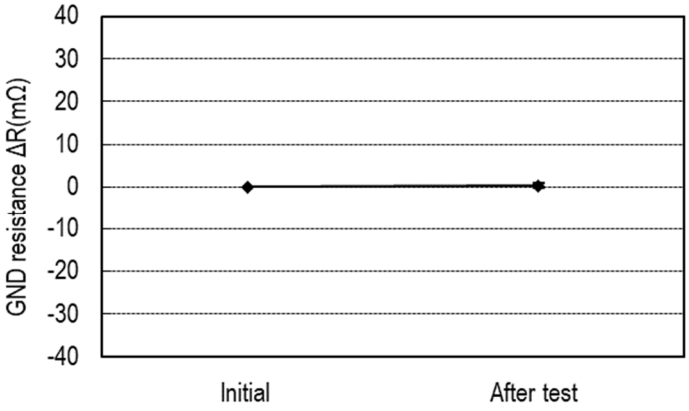
Graph7. A change of contact resistance (D Group: Thermal shock)



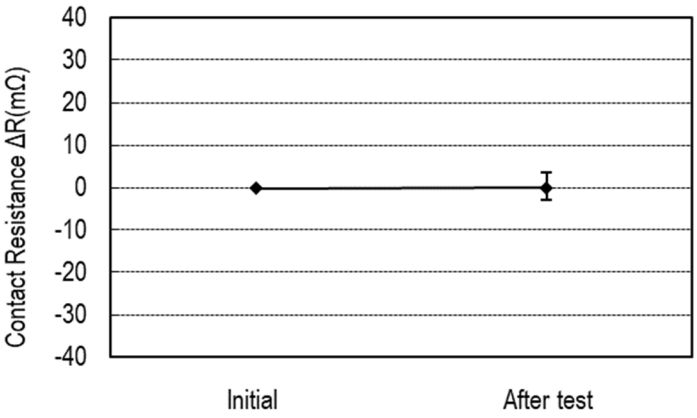
Graph8. A change of GND resistance (D Group: Thermal shock)

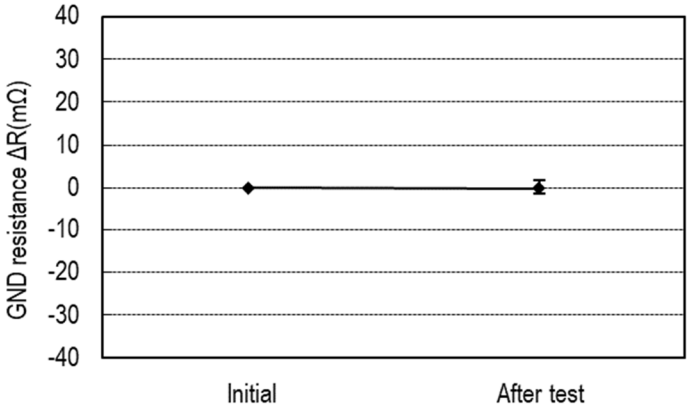


Graph9. A change of contact resistance (E Group: High temp. life)

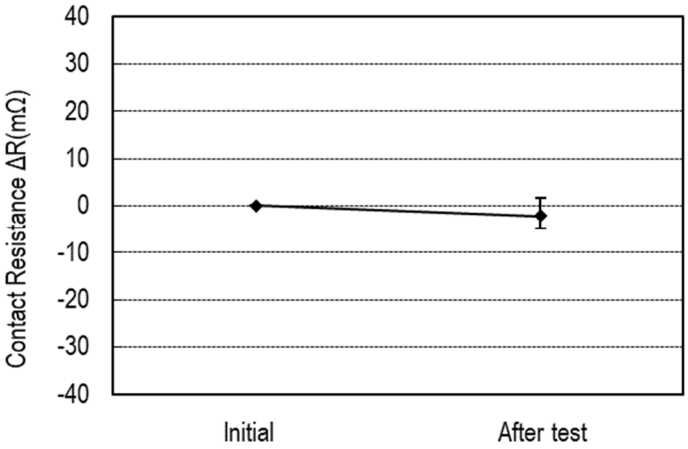


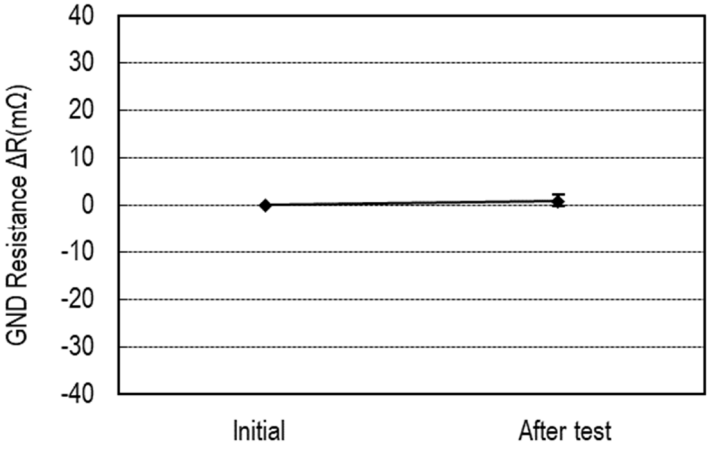
Graph10. A change of GND resistance (E Group: High temp. life)



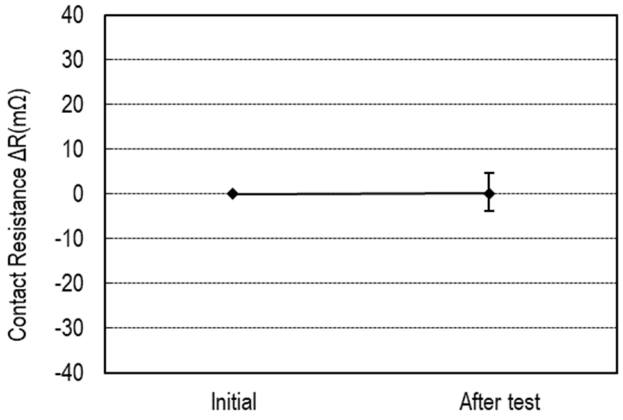


Graph11. A change of contact resistance (F Group: Humidity(Steady state)) Graph12. A change of GND resistance (F Group: Humidity(Steady state))

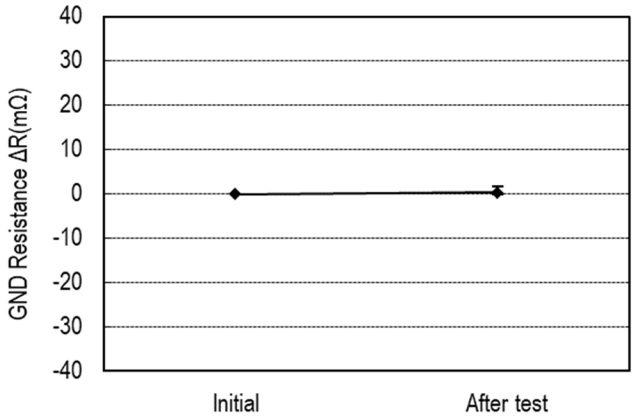




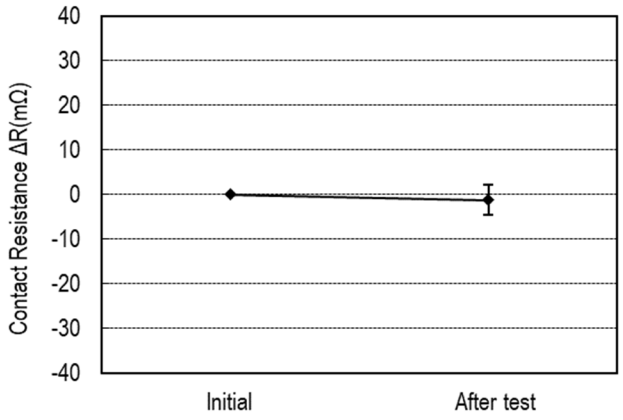
Graph 13. A change of contact resistance (G Group: Humidity(Cycling)) Graph14. A change of GND resistance (G Group: Humidity(Cycling))



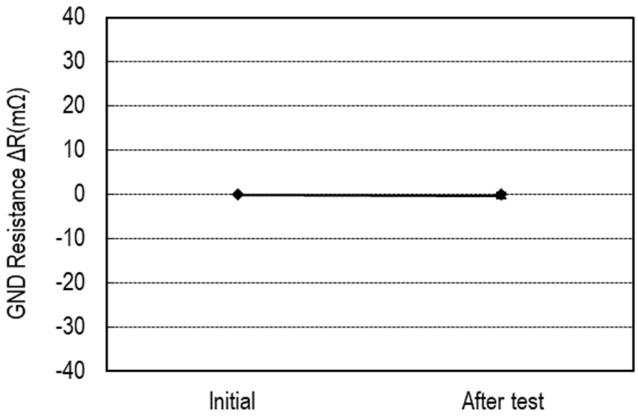
Graph15. A change of contact resistance (H Group: Salt spray)



Graph16. A change of GND resistance (H Group: Salt spray)



Graph17. A change of contact resistance (J Group: Gas(H_2S))



Graph18. A change of contact resistance (J Group: Gas(H_2S))