

NOVASTACK® 35-HDH

Part No. 21003-0**E, 21004-0**E

Test Report

Product Specification no. PRS-2785

Rev.	ECN	Date	Prepared by	Checked by	Approved by
1	T24075	October 31, 2024	Y. Baba	-	S. Suzuki
0	T24008	March 13, 2024	Y. Baba	-	S. Suzuki

1. Purpose

To evaluate the performance of NOVASTACK 35-HDH Connector in accordance with PRS-2785.

2. Specimen

- (1) NOVASTACK 35-HDH PLUG ASSEMBLY (Part No. 21003-0**E)
- (2) NOVASTACK 35-HDH RECEPTACLE ASSEMBLY (Part No. 21004-0**E)

3. Test Sequence

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

4. Result

See Table 2-1 to 2-3, Graph 1 to 17. For the details of the testing conditions and requirements, see PRS-2785.
The "n" in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-2785.

Table 1 Test Sequence and Sample Quantity

No.	Test Item	Testing Groups													
		A	B	C	D	E	F	G	H	J	K	L	M	N	
4.1 Electrical Performance	1	Contact resistance		2,6		1,3,5	1,5	1,3	1,5	1,5	1,3	1,3			
	2	Insulation resistance					2,6		2,6	2,6					
	3	Dielectric withstanding voltage					3,7		3,7	3,7					
	4	Temperature rising	1												
4.2 Mechanical Performance	1	Mating force		1,5											
		Unmating force		3,7											
	2	Durability		4											
	3	Contact retention force			1										
	4	Vibration				2									
5	Shock				4										
4.3 Environmental Performance	1	Thermal shock					4								
	2	High temperature life						2							
	3	Humidity (Steady State)							4						
	4	Humidity (Cycling)								4					
	5	Saltwater spray									2				
	6	H ₂ S gas										2			
4.4 Others	1	Solder ability											1		
	2	Soldering heat resistance												1	
	3	Soldering iron													1
Specimen quantity			5	5	20	5	5	5	5	5	5	5	10	10	10
			pcs.	pcs.	pcs.	pcs.	pcs.	pcs.	pcs.	pcs.	pcs.	pcs.	pcs.	pcs.	pcs.

※Numbers indicate test sequences

Table.2-1 Test result

Group	Contents of Measurement	Spec.	Unit	Q'ty	n	Data					Judge.			
						AVE.	MAX.	MIN.	S	X±3s				
A	Temperature Rising													
	60P Contact 0.2A/Contact (Total:12.0A)	ΔT 30 MAX.	℃	5	-	ΔT	10.3	MAX.				Pass		
	70P Contact 0.17A/Contact (Total:12.0A)		℃	5	-							7.3	Pass	
B	Durability													
	Contact Resistance													
	Contact	Initial	50 MAX.	mohm	5	300	15.181	17.73	12.50	1.193	18.759	Pass		
		After 20 cycles	ΔR 50 MAX.				-1.762	1.26	-5.75	1.278	-5.597	Pass		
	Ground	Initial	20 MAX.				0.363	0.43	0.30	0.048	0.507	Pass		
		After 20 cycles	ΔR 20 MAX.				0.029	0.10	-0.07	0.066	0.226	Pass		
	Mating Force													
	60P	Initial	60.0 MAX.				N	5	-	19.66	20.9	18.3	-	-
		After 20 cycles		12.62	13.6	10.9				-	-	Pass		
	70P	Initial	70.0 MAX.	N	5	-	24.90	26.2	24.0	-	-	Pass		
		After 20 cycles					10.78	12.1	9.9	-	-	Pass		
	Unmating Force													
	60P	Initial	6.0 MIN.	N	5	-	23.62	24.5	22.4	-	-	Pass		
		After 20 cycles					16.20	17.4	15.5	-	-	Pass		
	70P	Initial	7.0 MIN.	N	5	-	21.92	25.1	20.1	-	-	Pass		
After 20 cycles		12.44					13.6	12.0	-	-	Pass			
C	Contact Retention Force													
	Receptacle													
	Contact	0.1 MIN.	N	-	20	1.09		MIN.				Pass		
Ground (Shell)	1.62					Pass								
D	Vibration → Shock													
	Contact Resistance													
	Contact	Initial	50 MAX.	mohm	5	300	14.652	16.74	11.93	0.871	17.266	Pass		
		After Vibration	ΔR 50 MAX.				-0.237	3.22	-3.16	1.115	-3.583	Pass		
		After Shock					0.315	3.78	-2.87	1.066	3.514	Pass		
	Ground	Initial	20 MAX.				0.430	0.45	0.41	0.016	0.477	Pass		
		After Vibration	ΔR 20 MAX.				0.011	0.06	-0.01	0.021	0.073	Pass		
		After Shock					0.013	0.08	-0.01	0.027	0.094	Pass		
	Electrical Discontinuity													
		During Test	1 MAX.	μs	5	-	No Discontinuity					Pass		
Appearance														
	After Test	No Abnormality	-	5	-	No Abnormality					Pass			

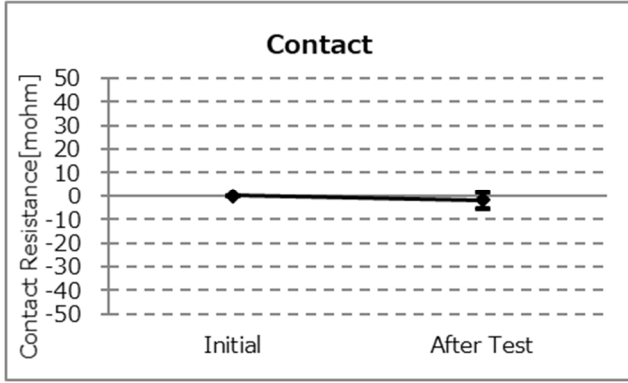
Table.2-2 Test result

Group	Contents of Measurement	Spec.	Unit	Q'ty	n	Data					Judge.	
						AVE.	MAX.	MIN.	S	X±3s		
E	Thermal Shock											
	Contact Resistance											
	Contact	Initial	50 MAX.	mohm	5	300	14.793	16.28	12.96	0.650	16.745	Pass
		After Test	ΔR 50 MAX.				0.222	2.57	-2.29	0.874	2.844	Pass
	Ground	Initial	20 MAX.			5	0.376	0.40	0.36	0.017	0.426	Pass
		After Test	ΔR 20 MAX.				0.022	0.09	0.00	0.035	0.126	Pass
	Insulation Resistance											
		Initial	1000 MIN.	Mohm	5	-	6.8 × 10 ⁴ MIN.				Pass	
		After Test	500 MIN.				5.9 × 10 ⁴ MIN.				Pass	
	Dielectric Withstanding Voltage											
		After Test	No Abnormality	-	5	-	No Abnormality				Pass	
Appearance												
	After Test	No Abnormality	-	5	-	No Abnormality				Pass		
F	High Temperature Life											
	Contact Resistance											
	Contact	Initial	50 MAX.	mohm	5	300	14.739	16.27	13.21	0.679	16.775	Pass
		After Test	ΔR 50 MAX.				0.583	3.35	-2.15	0.950	3.434	Pass
	Ground	Initial	20 MAX.			5	0.374	0.39	0.36	0.011	0.408	Pass
		After Test	ΔR 20 MAX.				0.033	0.09	0.00	0.039	0.151	Pass
	Appearance											
	After Test	No Abnormality	-	5	-	No Abnormality				Pass		
G	Humidity (Steady State)											
	Contact Resistance											
	Contact	Initial	50 MAX.	mohm	5	300	14.763	16.18	13.03	0.638	16.677	Pass
		After Test	ΔR 50 MAX.				0.212	2.15	-2.33	0.875	2.837	Pass
	Ground	Initial	20 MAX.			5	0.382	0.39	0.37	0.008	0.407	Pass
		After Test	ΔR 20 MAX.				0.030	0.18	0.00	0.057	0.200	Pass
	Insulation Resistance											
		Initial	1000 MIN.	Mohm	5	-	10.3 × 10 ⁴ MIN.				Pass	
		After Test	500 MIN.				4.7 × 10 ⁴ MIN.				Pass	
	Dielectric Withstanding Voltage											
		After Test	No Abnormality	-	5	-	No Abnormality				Pass	
Appearance												
	After Test	No Abnormality	-	5	-	No Abnormality				Pass		

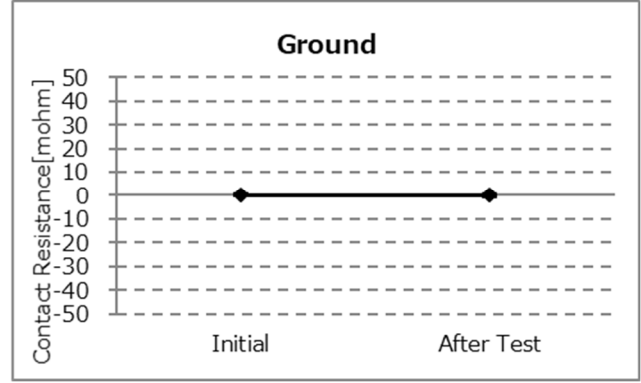
Table.2-3 Test result

Group	Contents of Measurement	Spec.	Unit	Q'ty	n	Data					Judge.		
						AVE.	MAX.	MIN.	S	X±3s			
H	Humidity (Cycling)												
	Contact resistance												
	Contact	Initial	50	MAX.	mohm	5	300	14.081	17.13	11.94	0.950	16.932	Pass
		After Test	ΔR	50				MAX.	0.129	5.33	-3.37	1.261	3.912
	Ground	Initial	20	MAX.	mohm	5	5	0.486	0.52	0.39	0.057	0.658	Pass
		After Test	ΔR	20				MAX.	0.055	0.18	0.00	0.066	0.254
	Insulation Resistance												
		Initial	1000	MIN.	Mohm	5	-	6.3 x 10 ⁴ MIN.				Pass	
		After Test	500	MIN.				12.0 x 10 ⁴ MIN.				Pass	
	Dielectric Withstanding Voltage												
	After Test	No Abnormality	-	5	-	No Abnormality					Pass		
Appearance													
	After Test	No Abnormality	-	5	-	No Abnormality					Pass		
J	Salt Water Spray												
	Contact Resistance												
	Contact	Initial	50	MAX.	mohm	5	300	14.800	16.34	13.02	0.665	16.794	Pass
		After Test	ΔR	50				MAX.	-0.327	2.38	-2.96	1.057	-3.498
	Ground	Initial	20	MAX.	mohm	5	5	0.376	0.39	0.36	0.013	0.416	Pass
		After Test	ΔR	20				MAX.	0.016	0.11	-0.06	0.050	0.165
	Appearance												
	After Test	No Abnormality	-	5	-	No Abnormality					Pass		
K	H ₂ S Gas												
	Contact Resistance												
	Contact	Initial	50	MAX.	mohm	5	300	14.662	16.26	13.14	0.644	16.594	Pass
		After Test	ΔR	50				MAX.	0.790	4.53	-2.26	1.282	4.635
	Ground	Initial	20	MAX.	mohm	5	5	0.384	0.40	0.37	0.013	0.424	Pass
		After Test	ΔR	20				MAX.	0.022	0.07	0.00	0.029	0.109
	Appearance												
	After Test	No Abnormality	-	5	-	No Abnormality					Pass		
L	Solder Ability												
	Solder Wetting Area												
	After Test	95	MIN.	%	10	-	95 MIN.					Pass	
M	Resistance to Reflow Soldering Heat												
	Appearance												
	After Test	No Abnormality	-	10	-	No Abnormality					Pass		
N	Soldering Iron												
	Appearance												
	After Test	No Abnormality	-	10	-	No Abnormality					Pass		

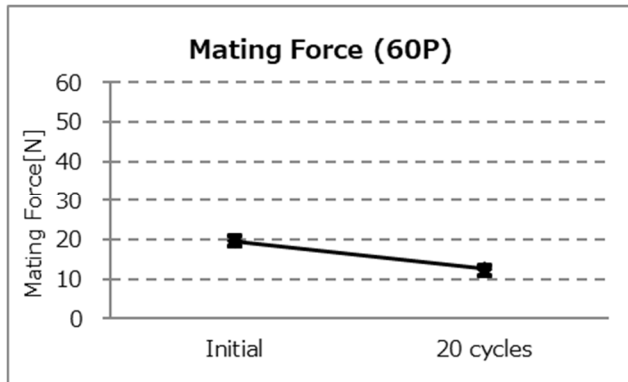
B Group / Durability



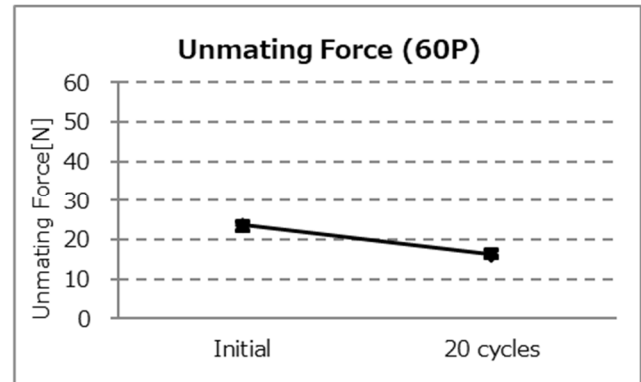
Graph-1. A change of contact resistance



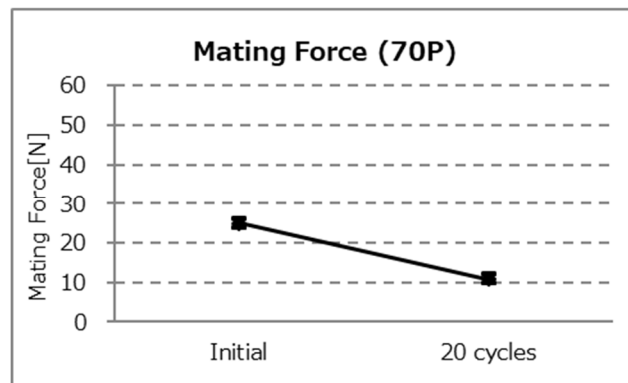
Graph-2. A change of power GND contact resistance



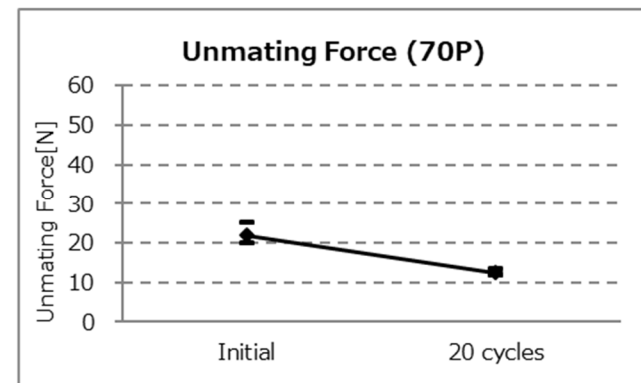
Graph-3-1. A change of mating force 60P



Graph-3-2. A change of unmating force 60P

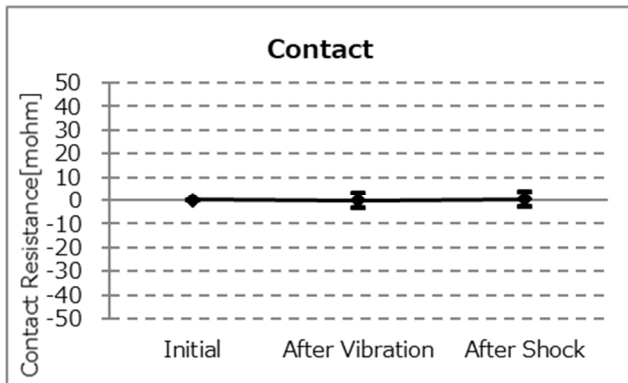


Graph-3-3. A change of mating force 70P

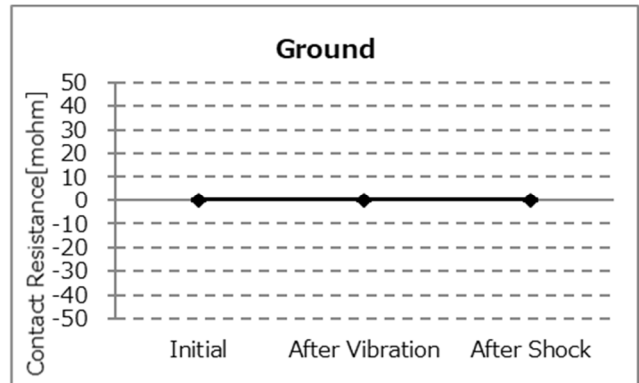


Graph-3-4. A change of unmating force 70P

D Group / Vibration → Shock

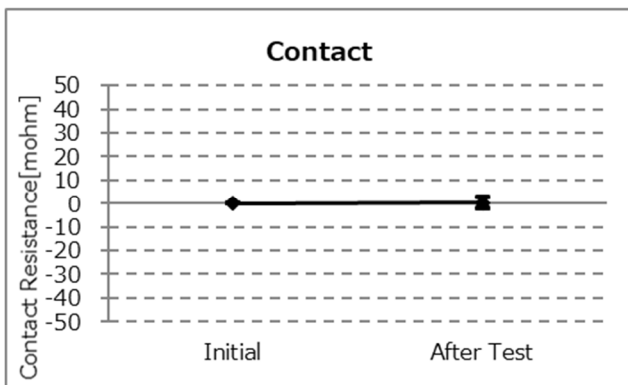


Graph-4. A change of contact resistance

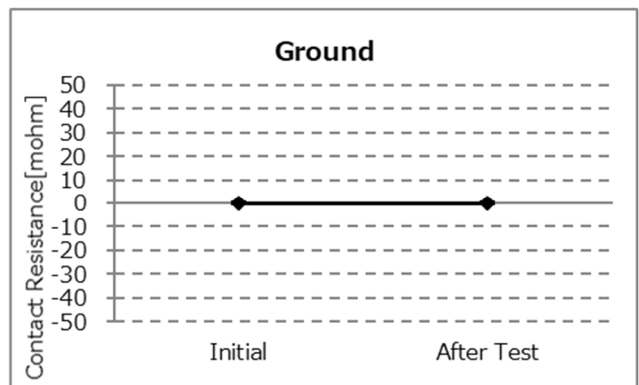


Graph-5. A change of power GND contact resistance

E Group / Thermal Shock

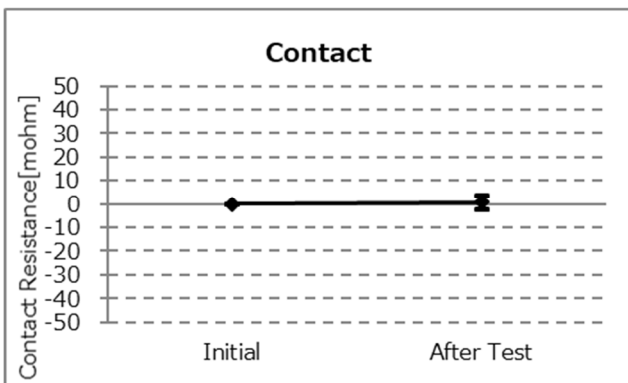


Graph-6. A change of contact resistance

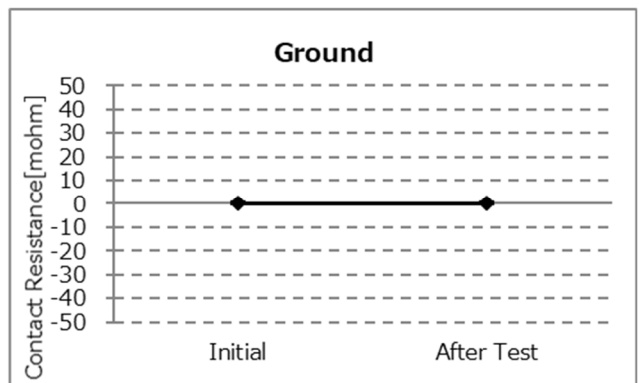


Graph-7. A change of GND contact resistance

F Group / High Temperature Life

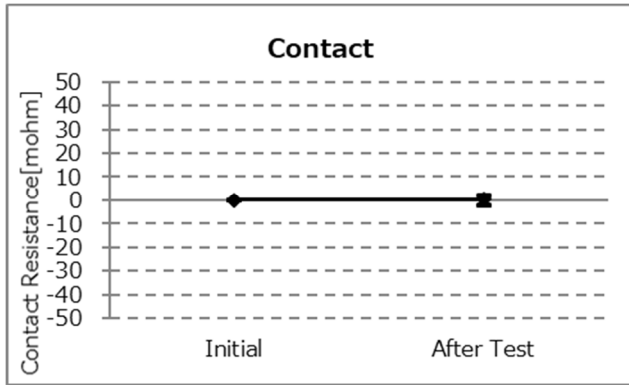


Graph-8. A change of contact resistance

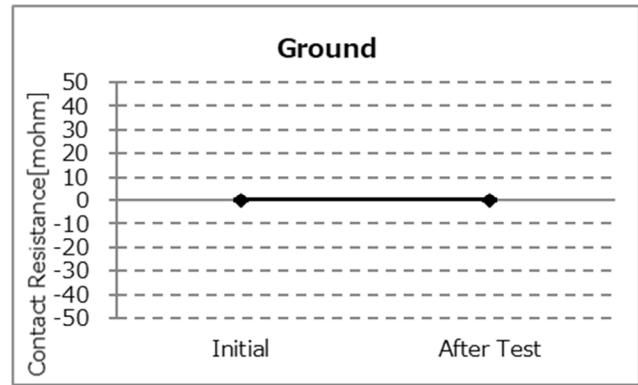


Graph-9. A change of GND contact resistance

G Group / Humidity (Steady State)

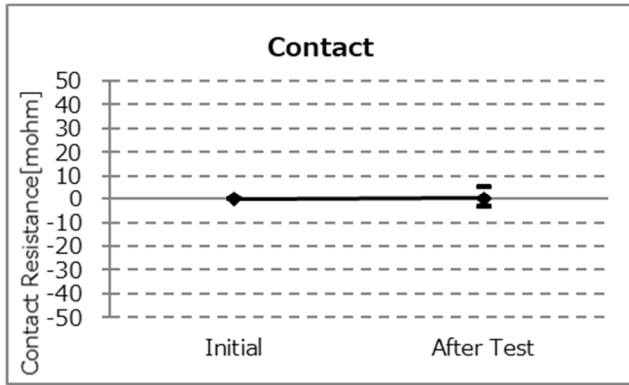


Graph-10. A change of contact resistance

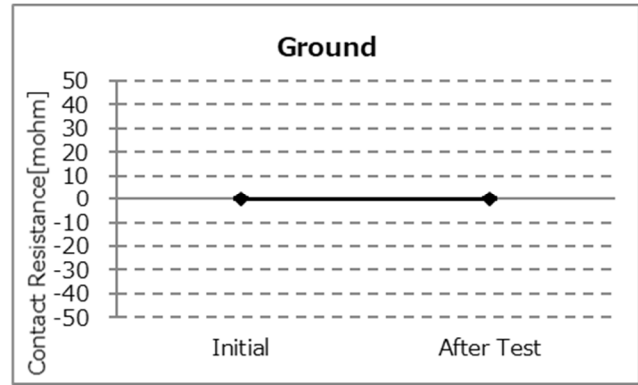


Graph-11. A change of GND contact resistance

H Group / Humidity (Cycling)

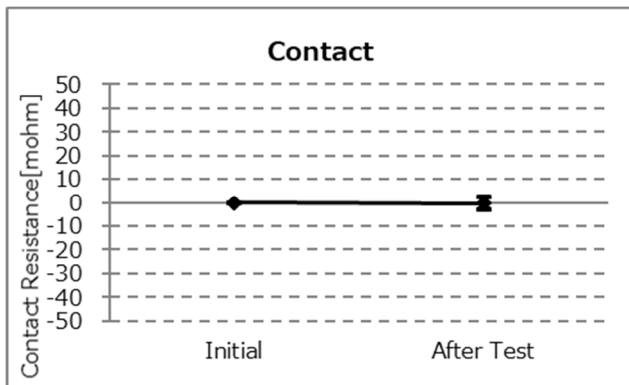


Graph-12. A change of contact resistance

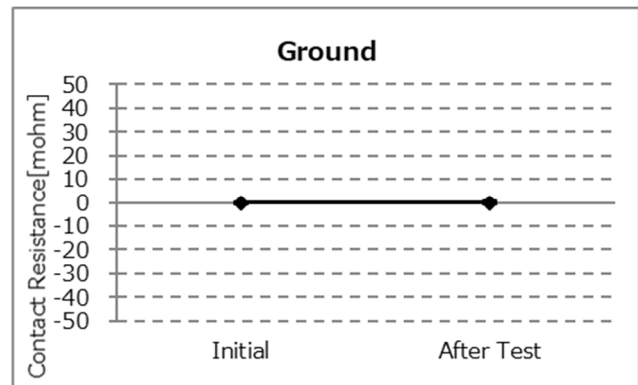


Graph-13. A change of GND contact resistance

J Group / Salt Water Spray

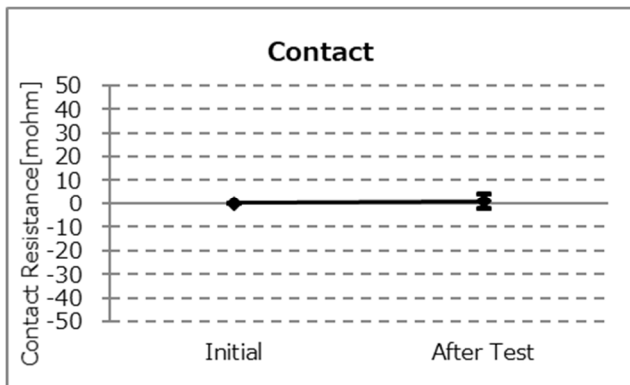


Graph-14. A change of contact resistance

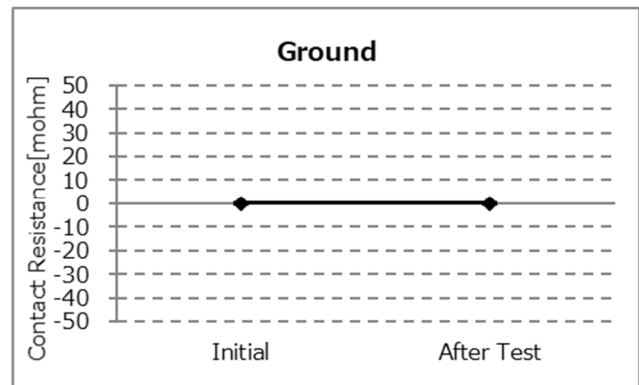


Graph-15. A change of GND contact resistance

K Group / H2S Gas



Graph-16. A change of contact resistance



Graph-17. A change of GND contact resistance