

NOVASTACK® 35-HDP

Part No. 20697-0**E-0#-#, 20698-0**E-0#

Test Report

Product Specification no. PRS-2187

8	T25040	May 12, 2025	T.Matsunaga	-	S.Suzuki
7	T24034	June 19, 2024	Y.Fukumoto	-	S.Suzuki
6	T22065	April 25, 2022	H.Lu	Y.Shimizu	M.Takemoto
5	T21153	November 5, 2021	Y.Kuribayashi	S.Suzuki	Y.Hashimoto
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of NOVASTACK 35-HDPConnector in accordance with PRS-2187.

2. Specimen

- (1) NOVASTACK 35-HDP PLUG ASS'Y (P/N: 20697-0**E-0#.#)
- (2) NOVASTACK 35-HDP RECEPTACLE ASS'Y (P/N: 20698-0**E-0#)

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 26. For the details of the testing conditions and requirements, see PRS-2187.
The “n” in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-2187.

Table 1 Test Sequence and Sample Quantity

Test Item	Group											
	A	B	C	D	E	F	G	H	J	K	L	M
Contact Resistance	2,6		1,3,5	1,5	1,3	1,5	1,5,7	1,3	1,3			
Insulation Resistance				2,6		2,6	2,8					
D. W. Voltage				3,7		3,7	3,9					
Temperature Rising												1
Mating Force	1,5											
Unmating Force	3,7											
Durability	4						4 (10cycles)					
Contact Retention Force		1,3										
Vibration			2									
Shock			4									
Thermal Shock				4								
High Temperature Life		2			2							
Humidity (Steady State)						4						
Humidity (Cycling)							6					
Salt Water Spray								2				
Gas (H ₂ S)									2			
Solderability										1		
Soldering Heat Resistance											1	
Sample QTY.	5 pcs.	20 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	10 pcs.	10 pcs.	5 pcs.

※Numbers indicate sequence in which tests are performed.

Table 2-1. Test result

Group	Contents of measurement		Spec.	Unit	Q'ty	n	Data					Judge.		
							AVE.	MAX.	MIN.	S	X±3s			
A	Durability													
	Contact resistance													
	Signal contact	Initial	40	MAX.	mΩ	5	210	15.223	17.22	14.15	0.690	17.293	Pass	
		After 30 cycles	ΔR 40	MAX.				0.324	3.78	-2.91	1.568	5.028	Pass	
	Power contact	Initial	20	MAX.			20	2.985	3.78	2.47	0.403	4.194	Pass	
		After 30 cycles	ΔR 20	MAX.				0.115	0.61	-0.57	0.327	1.096	Pass	
	GND	Initial	20	MAX.			10	9.095	10.17	8.50	0.468	10.499	Pass	
		After 30 cycles	ΔR 20	MAX.				1.162	1.78	0.38	0.434	2.464	Pass	
	Mating force													
	16P	Initial	32.0	MAX.	N	5	-	21.498	22.35	20.78	-	-	Pass	
		After 30 cycles						9.630	10.36	9.04	-	-	Pass	
	28P	Initial	32.0	MAX.			-	28.318	29.54	27.35	-	-	Pass	
		After 30 cycles						11.012	12.12	10.24	-	-	Pass	
	34P	Initial	38.0	MAX.			-	30.988	31.80	30.17	-	-	Pass	
		After 30 cycles						12.738	13.33	12.54	-	-	Pass	
	42P	Initial	46.0	MAX.			-	32.592	33.71	31.51	-	-	Pass	
		After 30 cycles						14.194	14.66	13.42	-	-	Pass	
	56P	Initial	60.0	MAX.			-	39.758	42.40	38.37	-	-	Pass	
		After 30 cycles						19.596	21.23	18.08	-	-	Pass	
	62P	Initial	66.0	MAX.			-	45.920	47.20	44.10	-	-	Pass	
		After 30 cycles						21.840	23.00	21.30	-	-	Pass	
	Unmating force													
	16P	Initial	3.2	MIN.			N	5	-	10.180	10.42	9.99	-	-
		After 30 cycles			6.456	6.81				5.89	-	-	Pass	
	28P	Initial	3.2	MIN.	-	14.360			15.21	13.54	-	-	Pass	
		After 30 cycles				10.226			11.32	9.43	-	-	Pass	
	34P	Initial	3.8	MIN.	-	15.122			15.91	14.34	-	-	Pass	
		After 30 cycles				10.824			11.39	9.99	-	-	Pass	
	42P	Initial	4.6	MIN.	-	15.988			17.88	15.13	-	-	Pass	
		After 30 cycles				9.942			10.40	9.30	-	-	Pass	
	56P	Initial	6.0	MIN.		20.800			21.63	20.45	-	-	Pass	
		After 30 cycles				13.340			13.93	12.94	-	-	Pass	
	62P	Initial	6.6	MIN.	-	18.940			19.60	18.00	-	-	Pass	
		After 30 cycles				18.060			19.30	16.50	-	-	Pass	

B	Contact retention force											
	Plug											
	Signal contact	Initial	0.6	MIN.	N	-	20	2.52 MIN.		-	-	Pass
		After test						2.07 MIN.		-	-	Pass
	Power contact	Initial						3.80 MIN.		-	-	Pass
		After test						3.92 MIN.		-	-	Pass
	Receptacle											
	Signal contact	Initial	0.1	MIN.	N	-	20	0.42 MIN.		-	-	Pass
		After test						0.34 MIN.		-	-	Pass
	Power contact	Initial						0.53 MIN.		-	-	Pass
		After test						0.48 MIN.		-	-	Pass

*Appearance Spec.: No abnormality adversely affecting the performance shall occur.

Table 2-2. Test result

Group	Contents of measurement		Spec.	Unit	Q'ty	n	Data					Judge.	
							AVE.	MAX.	MIN.	S	X±3s		
C	Vibration → Shock												
	Contact resistance												
	Signal contact	Initial	40	MAX.	mΩ	5	210	15.200	17.04	13.96	0.685	17.255	Pass
		After vibration	ΔR	40			MAX.	-0.500	0.32	-1.31	0.474	0.922	Pass
		After shock						-0.505	0.44	-1.39	0.393	0.674	Pass
	Power contact	Initial	20	MAX.		20	2.783	3.31	2.18	0.362	3.869	Pass	
		After vibration	ΔR	20			MAX.	0.166	0.72	-0.20	0.268	0.970	Pass
		After shock						0.324	0.87	-0.29	0.363	1.413	Pass
	GND	Initial	20	MAX.		10	8.145	9.28	7.38	0.585	9.900	Pass	
		After vibration	ΔR	20			MAX.	0.149	0.55	-0.20	0.281	0.992	Pass
		After shock						0.163	0.77	-0.27	0.288	1.027	Pass
	Electrical discontinuity												
	During test	1	MAX.	μs	5	-	No discontinuity					Pass	
Appearance													
	After test	*		-	5	-	No abnormality					Pass	

D	Thermal shock												
	Contact resistance												
	Signal contact	Initial	40	MAX.	mΩ	5	210	15.962	18.86	13.46	1.198	19.556	Pass
		After test	ΔR	40			MAX.	0.769	4.46	-2.70	1.376	4.897	Pass
	Power contact	Initial	20	MAX.		20	2.680	3.48	1.67	0.537	4.291	Pass	
		After test	ΔR	20			MAX.	0.420	1.09	-0.15	0.308	1.344	Pass
	GND	Initial	20	MAX.		10	8.865	9.38	8.45	0.356	9.933	Pass	
		After test	ΔR	20			MAX.	-0.067	0.61	-0.84	0.413	1.172	Pass
	Insulation resistance												
		Initial	1000	MIN.	MΩ	5	-	1.77 x 10 ⁵ Min.					Pass
		After test	500	MIN.				1.43 x 10 ⁵ Min.					Pass
	Dielectric Withstanding Voltage												
		After test	**		-	5	-	No abnormality					Pass
	Appearance												
		After test	*		-	5	-	No abnormality					Pass

E	High temperature life												
	Contact resistance												
	Signal contact	Initial	40	MAX.	mΩ	5	210	15.949	18.73	13.20	1.215	19.594	Pass
		After test	ΔR	40			MAX.	0.529	3.44	-2.26	1.110	3.859	Pass
	Power contact	Initial	20	MAX.		20	2.718	3.33	2.21	0.363	3.807	Pass	
		After test	ΔR	20			MAX.	-0.095	0.76	-0.80	0.437	1.216	Pass
	GND	Initial	20	MAX.		10	8.208	8.67	7.46	0.441	9.531	Pass	
		After test	ΔR	20			MAX.	-0.098	0.75	-0.75	0.465	1.297	Pass
	Appearance												
		After test	*		-	5	-	No abnormality					Pass

*Appearance Spec.: No abnormality adversely affecting the performance shall occur.

**Dielectric Withstanding Voltage Spec.: No abnormalities such as creeping discharge, flashover, insulator breakdown occur.

Table 2-3. Test result

Group	Contents of measurement		Spec.		Unit	Q'ty	n	Data					Judge.	
								AVE.	MAX.	MIN.	S	X±3s		
F	Humidity(steady state)													
	Contact resistance													
	Signal contact	Initial	40	MAX.	mΩ	5	210	16.158	18.74	13.94	1.143	19.587	Pass	
		After test	ΔR 40	MAX.				0.865	3.37	-1.63	1.103	4.174	Pass	
	Power contact	Initial	20	MAX.			20	2.786	3.62	2.18	0.393	3.965	Pass	
		After test	ΔR 20	MAX.				0.190	1.13	-0.84	0.582	1.936	Pass	
	GND	Initial	20	MAX.			10	8.295	8.78	7.56	0.378	9.429	Pass	
		After test	ΔR 20	MAX.				-0.186	0.30	-0.91	0.420	1.074	Pass	
	Insulation resistance													
		Initial	1000	MIN.	MΩ	5	-	1.28 x 10 ⁵ Min.					Pass	
		After test	500	MIN.				1.04 x 10 ⁵ Min.					Pass	
	Dielectric Withstanding Voltage													
		After test	* *		-	5	-	No abnormality					Pass	
	Appearance													
		After test	*		-	5	-	No abnormality					Pass	
G	Humidity(cycling)													
	Contact resistance													
	Signal contact	Initial	40	MAX.	mΩ	5	210	15.793	17.74	13.74	0.842	18.319	Pass	
		After 10cycle	ΔR 40	MAX.				-0.719	1.60	-2.52	0.786	1.639	Pass	
		After test						0.493	2.51	-1.63	0.881	3.136	Pass	
	Power contact	Initial	20	MAX.			20	2.982	3.70	2.33	0.426	4.260	Pass	
		After 10cycle	ΔR 20	MAX.				-0.041	1.29	-1.08	0.643	1.888	Pass	
		After test						0.114	1.36	-1.18	0.626	1.992	Pass	
	GND	Initial	20	MAX.			10	8.164	8.86	7.40	0.399	9.361	Pass	
		After 10cycle	ΔR 20	MAX.				-0.070	1.04	-1.31	0.709	2.057	Pass	
		After test						0.134	1.33	-0.46	0.559	1.811	Pass	
	Insulation resistance													
		Initial	1000	MIN.	MΩ	5	-	1.15 x 10 ⁵ Min.					Pass	
		After test	500	MIN.				1.04 x 10 ⁵ Min.					Pass	
	Dielectric Withstanding Voltage													
		After test	* *		-	5	-	No abnormality					Pass	
	Appearance													
		After test	*		-	5	-	No abnormality					Pass	
H	Salt water spray													
	Contact resistance													
	Signal contact	Initial	40	MAX.	mΩ	5	210	15.093	17.07	13.23	0.890	17.763	Pass	
		After test	ΔR 40	MAX.				0.201	3.68	-3.49	1.670	5.211	Pass	
	Power contact	Initial	20	MAX.			20	2.952	3.36	2.46	0.255	3.717	Pass	
		After test	ΔR 20	MAX.				-0.037	0.98	-0.53	0.382	1.109	Pass	
	GND	Initial	20	MAX.			10	8.050	8.70	7.55	0.404	9.262	Pass	
		After test	ΔR 20	MAX.				0.036	0.77	-0.61	0.444	1.368	Pass	
	Appearance													
		After test	*		-	5	-	No abnormality					Pass	

*Appearance Spec.: No abnormality adversely affecting the performance shall occur.

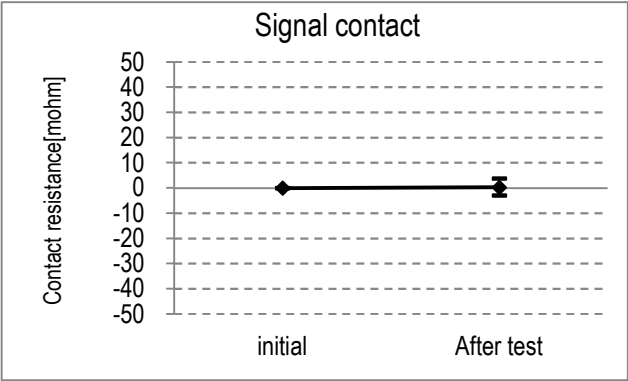
**Dielectric Withstanding Voltage Spec.: No abnormalities such as creeping discharge, flashover, insulator breakdown occur.

Table 2-4. Test result

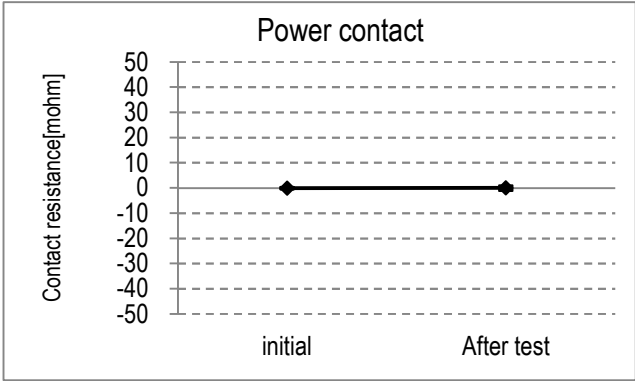
Group	Contents of measurement		Spec.		Unit	Q'ty	n	Data					Judge.
								AVE.	MAX.	MIN.	S	X±3s	
J	Gas												
	Contact resistance												
	Signal contact	Initial	40	MAX.	mΩ	5	210	15.721	17.80	13.61	0.920	18.481	Pass
		After test	ΔR 40	MAX.				0.599	3.41	-2.34	1.115	3.944	Pass
	Power contact	Initial	20	MAX.			20	2.961	3.84	2.24	0.345	3.996	Pass
		After test	ΔR 20	MAX.				-0.124	0.92	-1.06	0.550	1.526	Pass
	GND	Initial	20	MAX.			10	8.001	8.52	7.50	0.335	9.006	Pass
		After test	ΔR 20	MAX.				0.303	0.96	-0.28	0.418	1.557	Pass
	Appearance												
	After test		*	-	5	-	No abnormality					Pass	
K	Solder ability												
	Solder wetting area												
		After test		95	MIN.	%	10	-	95 MIN.				
L	Resistance to reflow soldering heat												
	Appearance												
		After test		*	-	10	-	No abnormality					Pass
M	Temperature rising												
	16P (Signal:0.30A,Power:2.20A)		ΔT 30	MAX.	℃	5	-	8.9 Max.					Pass
	28P (Signal:0.30A,Power:2.20A)							8.7 Max.					Pass
	34P (Signal:0.30A,Power:2.20A)							8.7 Max.					Pass
	42P (Signal:0.29A,Power:2.20A)							8.5 Max.					Pass
	56P (Signal:0.22A,Power:2.20A)							6.9 Max.					Pass
	62P (Signal:0.19A,Power:2.20A)							5.8 Max.					Pass

*Appearance Spec.: No abnormality adversely affecting the performance shall occur.

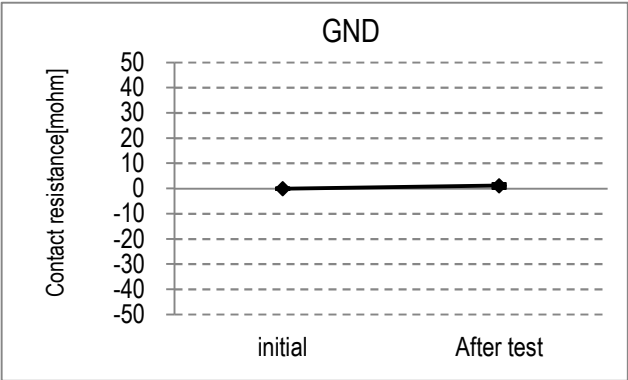
A Group / Durability



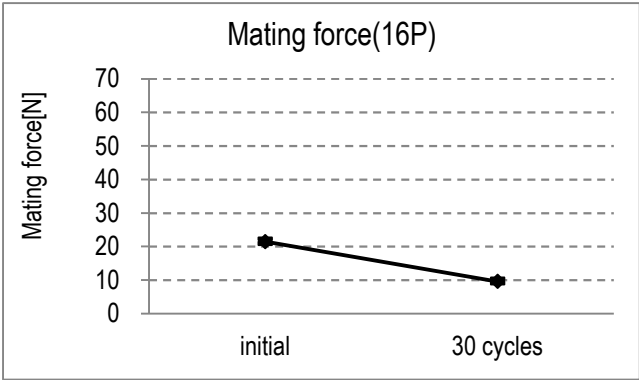
Graph-1. A change of signal contact resistance



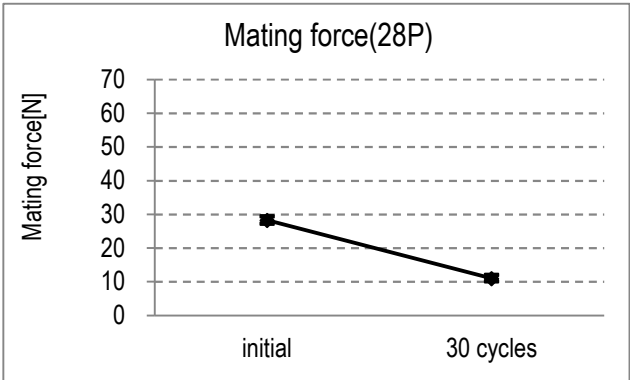
Graph-2. A change of power contact resistance



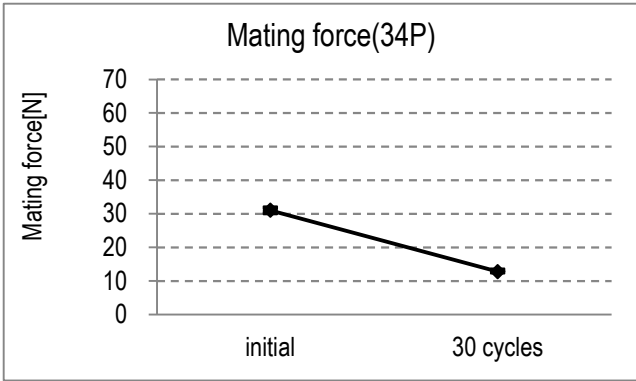
Graph-3. A change of GND contact resistance



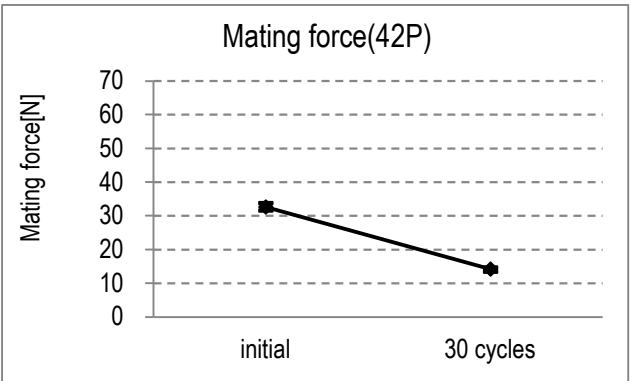
Graph-4-1. A change of mating force 16P



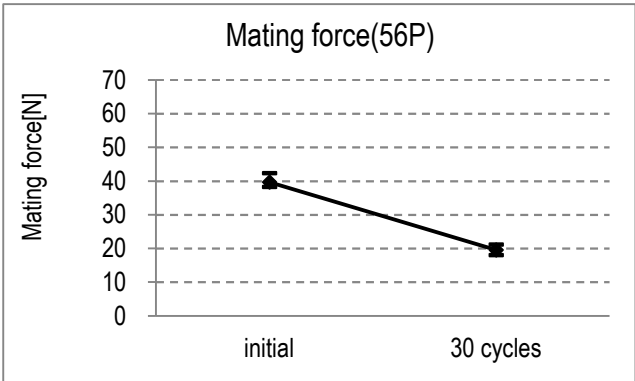
Graph-4-2. A change of mating force 28P



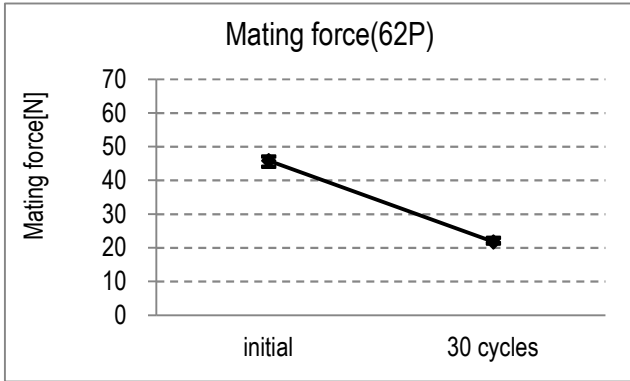
Graph-4-3. A change of mating force 34P



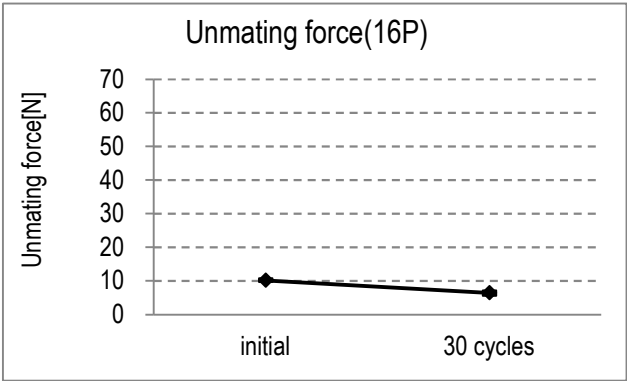
Graph-4-4. A change of mating force 42P



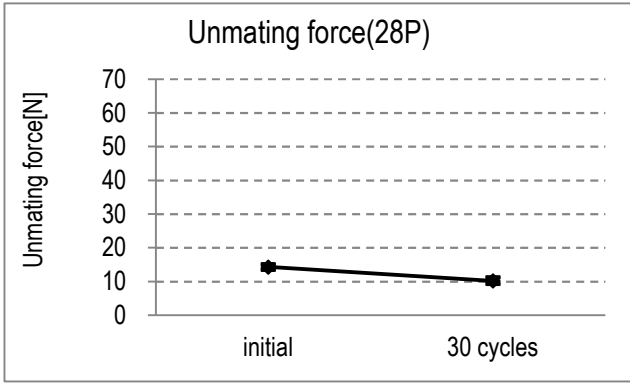
Graph-4-5. A change of mating force 56P



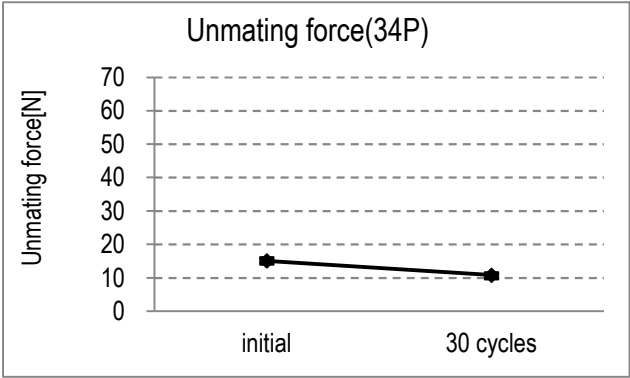
Graph-4-6. A change of mating force 62P



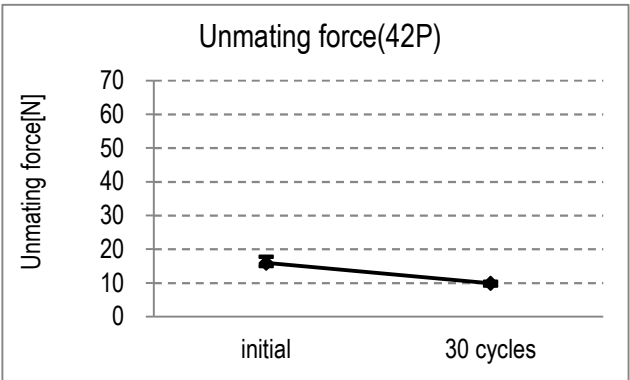
Graph-5-1. A change of unmating force 16P



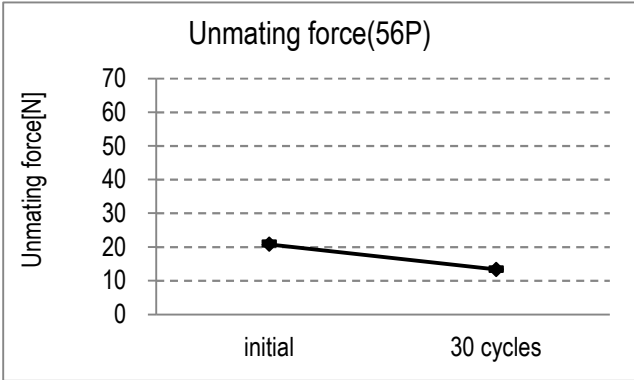
Graph-5-2. A change of unmating force 28P



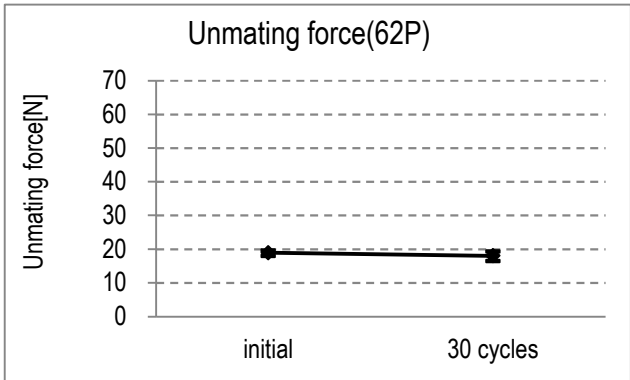
Graph-5-3. A change of unmating force 34P



Graph-5-4. A change of unmating force 42P

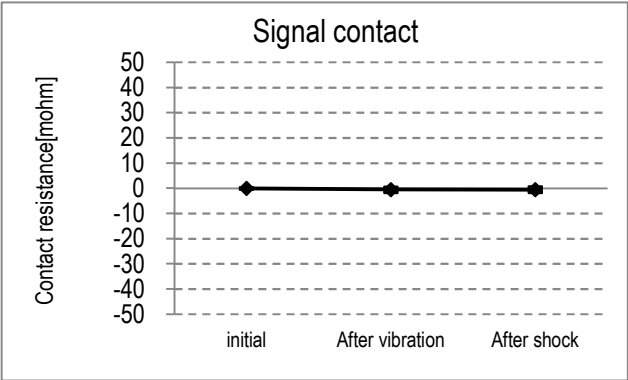


Graph-5-5. A change of unmating force 56P

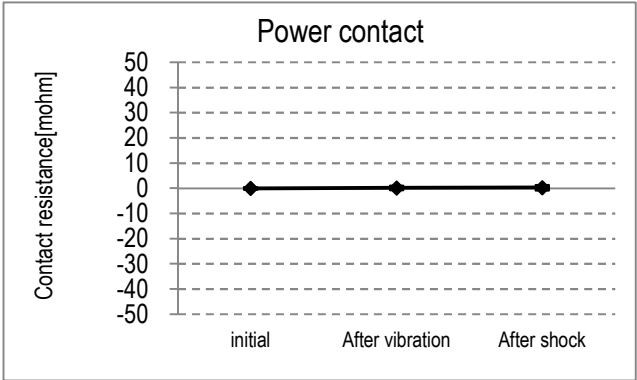


Graph-5-6. A change of unmating force 62P

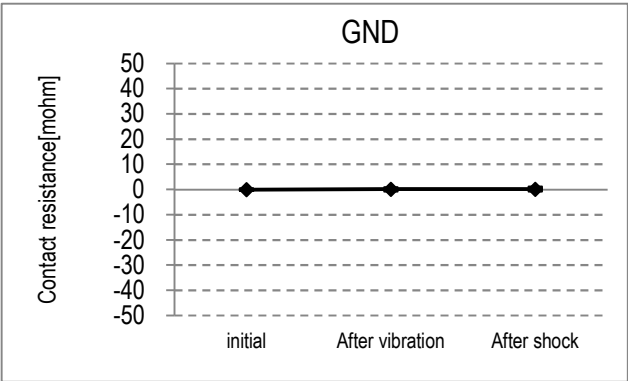
C Group / Vibration → Shock



Graph-6. A change of signal contact resistance

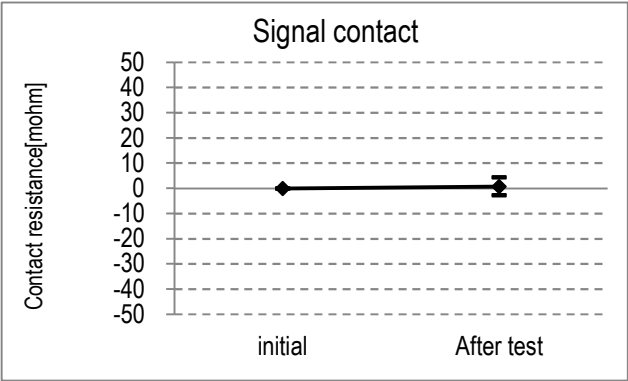


Graph-7. A change of power contact resistance

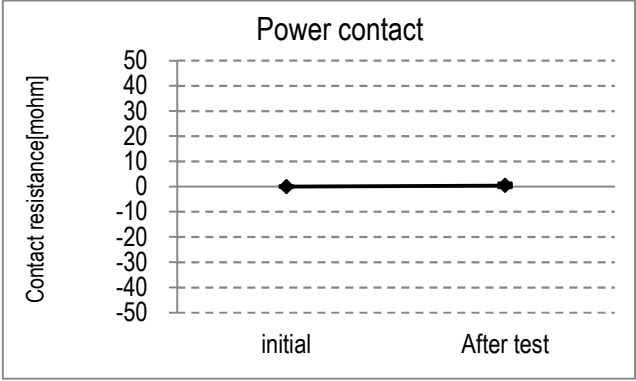


Graph-8. A change of GND contact resistance

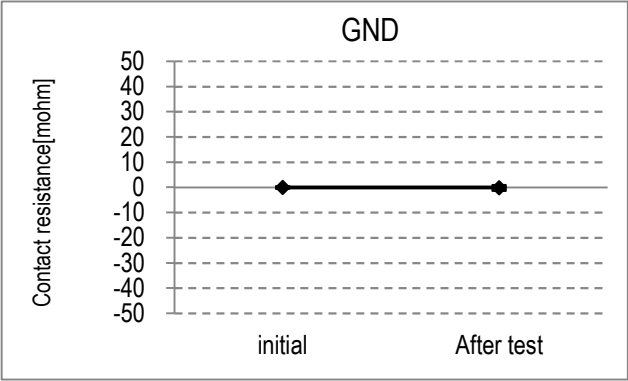
D Group / Thermal Shock



Graph-9. A change of signal contact resistance

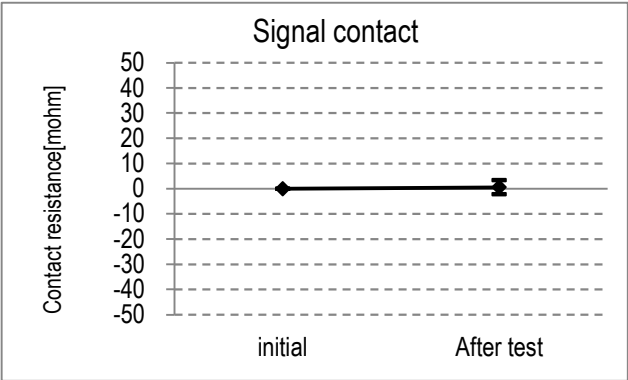


Graph-10. A change of power contact resistance

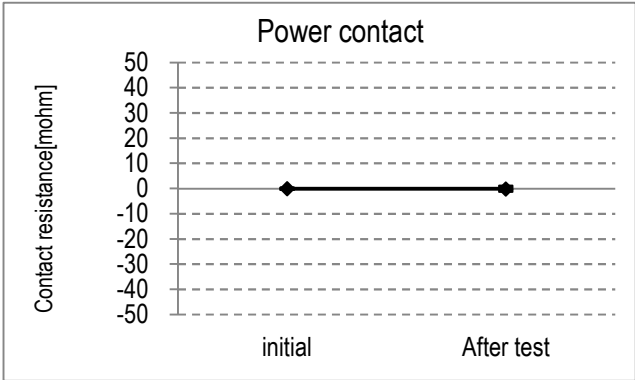


Graph-11. A change of GND contact resistance

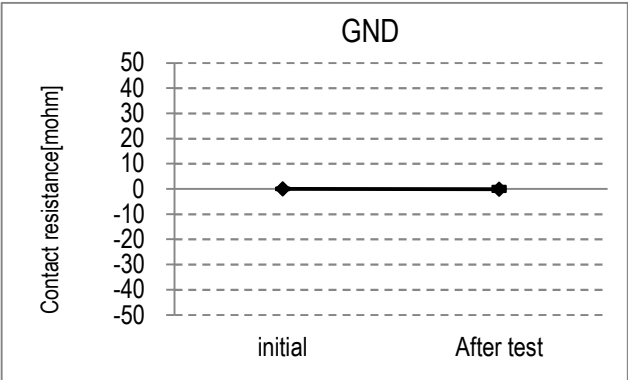
E Group / High Temperature Life



Graph-12. A change of signal contact resistance

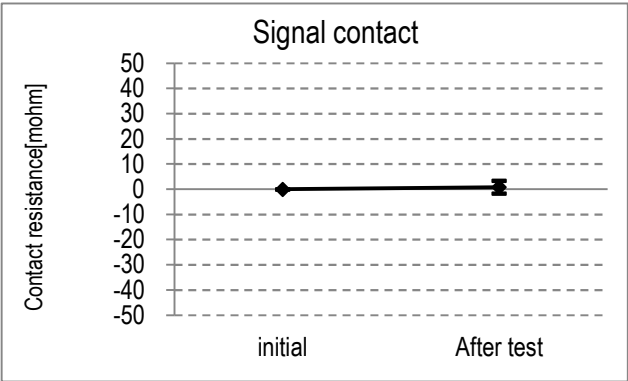


Graph-13. A change of power contact resistance

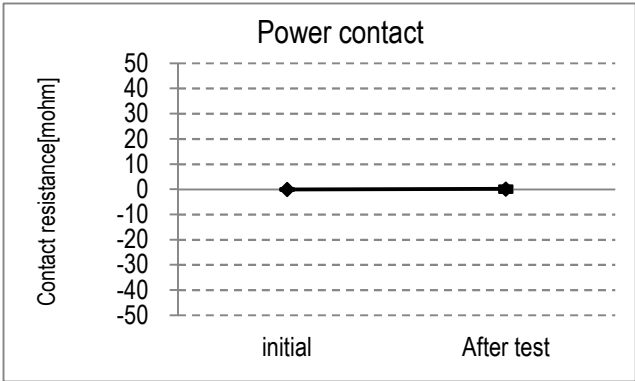


Graph-14. A change of GND contact resistance

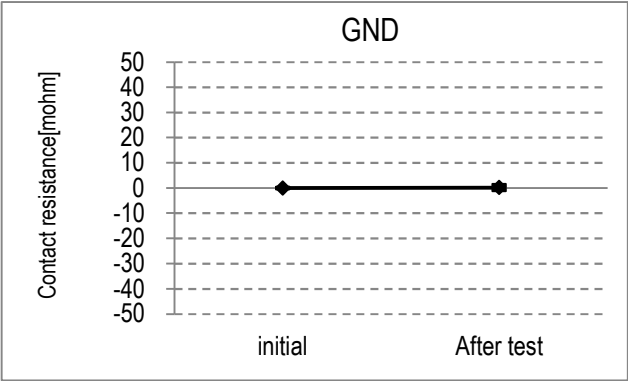
F Group / Humidity (Steady State)



Graph-15. A change of signal contact resistance

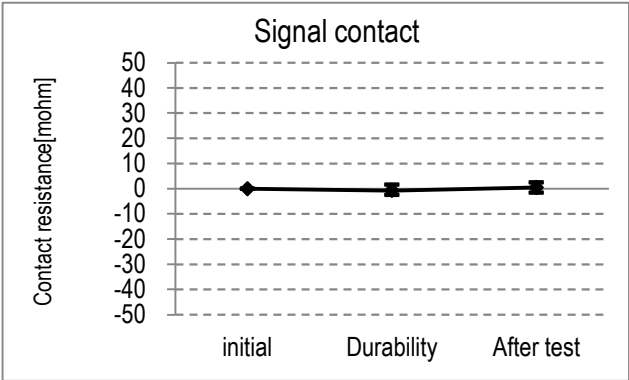


Graph-16. A change of power contact resistance

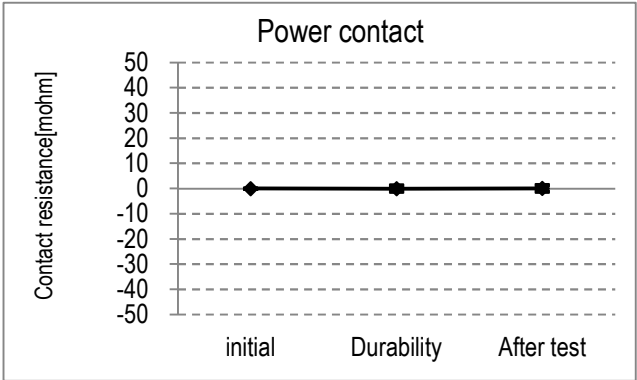


Graph-17. A change of GND contact resistance

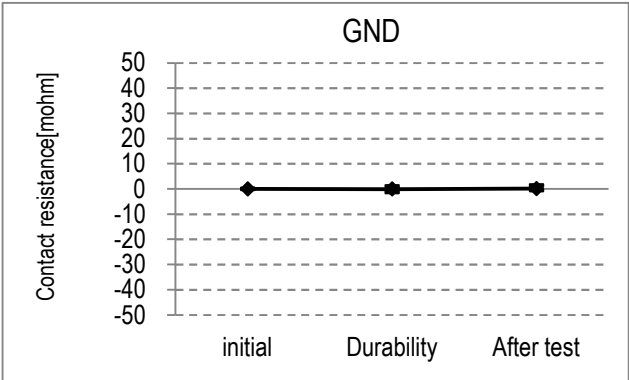
G Group / Humidity (Cycling)



Graph-18. A change of signal contact resistance

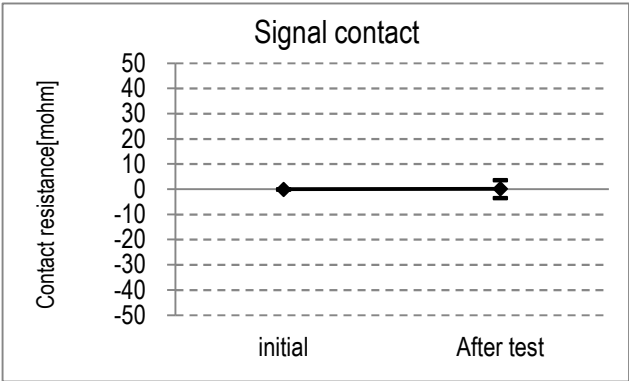


Graph-19. A change of power contact resistance

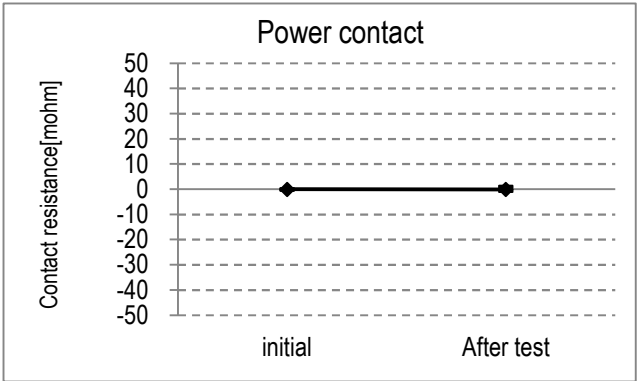


Graph-20. A change of GND contact resistance

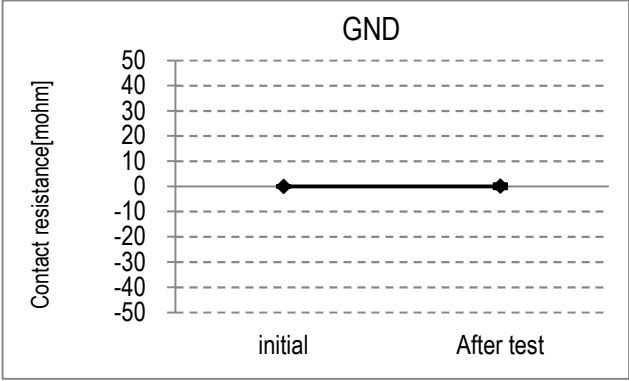
H Group / Salt Water Spray



Graph-21. A change of signal contact resistance

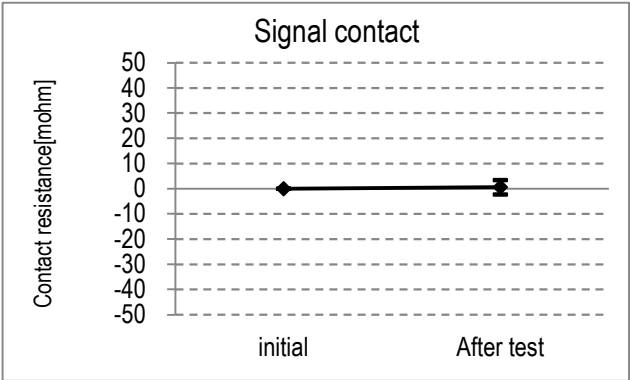


Graph-22. A change of power contact resistance

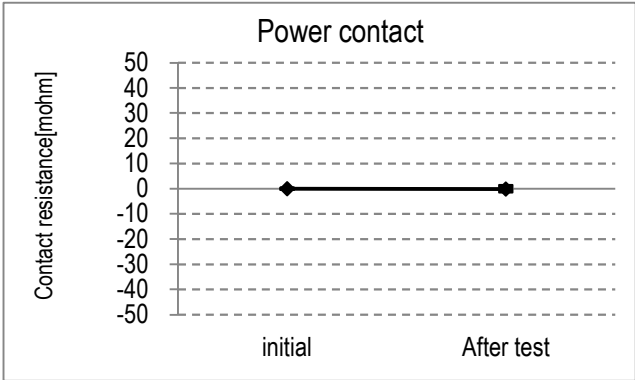


Graph-23. A change of GND contact resistance

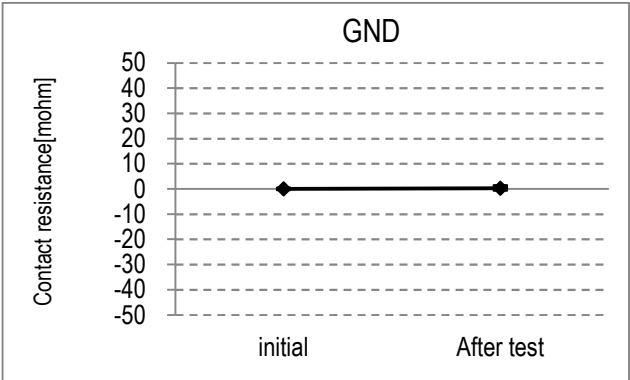
J Group / Gas



Graph-24. A change of signal contact resistance



Graph-25. A change of power contact resistance



Graph-26. A change of GND contact resistance