

CABLINE®-CA

Part No. Plug: 20633-2**T-0#S Receptacle: 20525-0**E-0##

Test Report

Product Specification no. PRS-1968

5	T21127	October 29, 2021	T.Ono	T.Masunaga	H.Ikari
4	T21074	September 22, 2021	M.Nakamura	T.Masunaga	H.Ikari
3	T18075	June 29, 2018	M.Nakamura	-	Y.Shimada
2	T18001	January 11, 2018	K.Ikeshita	-	T.Matsumoto
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of CABLINE-CA Connector in accordance PRS-1968.

2. Specimen

- (1) CABLINE-CA PLUG for CABLE ASS'Y (P/N : 20633-2**T-0#S)
- (2) CABLINE-CA RECE. ASS'Y (P/N : 20525-0**E-0##)

3. Test Sequence

All the evaluations were performed in accordance with Table 1 test sequence.

4. Result

See Table.2-1~2-6 and Graph.1~26.For the details of the testing conditions and requirements, see PRS-1968.

The “n” in the tables show the number of measurement points.

5. Conclusion

All the specimen met the requirements of PRS-1968.

Table.1 Test Sequence

Test Item	Group												
	A	B	C	D	E	F	G	H	J	K	L	M	N
Contact Resistance	2,6			1,3,5	1,3	1,3	1,5	1,5,7	1,3	1,3			
Insulation Resistance							2,6	2,8					
D. W. Voltage							3,7	3,9					
Temperature Rising													1
Mating Force	1,5												
Unmating Force	3,7												
Durability	4							4 (10cycles)					
Contact Retention Force		1,3											
Conn. Lock			1										
Cable Retention Force	8												
Vibration				2									
Shock				4									
Thermal Shock					2								
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 pos.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	10 pcs.	10 pcs.	5 pcs.

The number of group is test sequence.

Table.2-1 Test result

Test Item	Contents of Measurement		Specifications	Set	n	Data					Judge
						AVE.	MAX.	MIN.	s	$\bar{X} \pm 3s$	
A Group Durability Cable Retention Force	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX.	5	250	498.331	509.83	485.56	5.267	514.132	OK
		After Testing	AWG#40 ΔR=40mΩ MAX.			-0.032	4.91	-4.99	2.528	7.552	OK
		Initial	AWG#34 180mΩMAX.	5	250	143.462	151.73	136.74	2.849	152.009	OK
		After Testing	AWG#34 ΔR=40mΩ MAX.			-0.312	4.30	-4.48	1.797	5.079	OK
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	15.857	16.53	15.20	0.509	17.384	OK
		After Testing	ΔR=40mΩ MAX.			0.805	1.16	0.11	0.349	1.852	OK
	12P	Mating Force (N)	Initial	5	5	4.830	5.07	4.51	0.253	5.589	OK
			After Testing			3.598	3.71	3.39	0.131	3.991	OK
		Unmating Force (N)	Initial	5	5	3.570	3.73	3.38	0.171	3.057	OK
			After Testing			3.128	3.36	2.95	0.168	2.624	OK
		Cable Retention Force (N)		5	5	127.402	133.35	122.65	4.477	113.971	OK
		Mating Force (N)	Initial	5	5	5.510	5.95	4.84	0.442	6.836	OK
			After Testing			4.038	4.88	3.46	0.635	5.943	OK
		Unmating Force (N)	Initial	5	5	4.390	4.89	4.20	0.286	3.532	OK
			After Testing			3.870	4.22	3.40	0.368	2.766	OK
		Cable Retention Force (N)		5	5	136.67	143.27	129.98	5.401	120.467	OK
	30P	Mating Force (N)	Initial	5	5	7.976	8.68	7.50	0.441	9.299	OK
			After Testing			5.774	6.35	5.20	0.528	7.358	OK
		Unmating Force (N)	Initial	5	5	6.314	6.67	6.61	0.236	5.606	OK
			After Testing			5.538	5.89	5.36	0.214	4.896	OK
		Cable Retention Force (N)		5	5	138.726	149.09	132.13	7.885	115.071	OK

Table 2-2 Test result

Test Item	Contents of Measurement			Specifications	Set	n	Data					Judge
							AVE.	MAX.	MIN.	S	X±3s	
A Group Durability Cable Retention Force	40P	Mating Force (N)	Initial	19.40N MAX.	5	5	10.872	11.43	10.55	0.347	11.913	OK
			After Testing	19.40N MAX.			7.774	8.23	7.23	0.385	8.929	OK
		Unmating Force (N)	Initial	4.0N MIN.	5	5	8.392	8.68	8.00	0.290	7.522	OK
			After Testing	4.0N MIN.			7.148	7.42	6.88	0.247	6.407	OK
		Cable Retention Force (N)			19.60N MIN.	5	5	145.976	152.45	137.89	5.558	129.302
	50P	Mating Force (N)	Initial	24.25N MAX.	5	5	13.478	13.67	13.15	0.214	14.120	OK
			After Testing	24.25N MAX.			9.472	9.90	8.89	0.395	10.657	OK
		Unmating Force (N)	Initial	5.0N MIN.	5	5	10.392	10.88	10.18	0.288	9.528	OK
			After Testing	5.0N MIN.			9.432	9.89	9.05	0.301	8.529	OK
		Cable Retention Force (N)			24.50N MIN.	5	5	161.416	167.62	155.89	4.374	148.294
	60P	Mating Force (N)	Initial	29.10N MAX.	5	5	15.716	16.07	15.01	0.430	17.006	OK
			After Testing	29.10N MAX.			11.252	11.42	10.91	0.205	11.867	OK
		Unmating Force (N)	Initial	6.0N MIN.	5	5	11.872	12.48	11.52	0.367	10.771	OK
			After Testing	6.0N MIN.			10.884	11.39	10.32	0.388	9.720	OK
		Cable Retention Force (N)			29.40N MIN.	5	5	180.730	185.78	173.98	4.656	166.762
B Group High Temperature Life	Contact Retention Force (N) (PLUG)		Initial	0.6N MIN.	—	20	It does not pull out, even if applies the power of 1.8N to a terminal.					OK
			After Testing	0.6N MIN.	—	20	It does not pull out, even if applies the power of 1.8N to a terminal.					OK
	Contact Retention Force (N) (RECE)		Initial	0.2N MIN.	—	20	1.110	1.35	0.85	0.121	0.747	OK
			After Testing	0.2N MIN.	—	20	1.028	1.28	0.80	0.144	0.596	OK

Table 2-3 Test result

Test Item	Contents of Measurement		Specifications	Set	N	Data					Judge
						AVE.	MAX.	MIN.	s	X±3s	
C Group Conn. Lock	Initial		The lock does not damage and cancel.	5	5	No Abnormality					OK
D Group Vibration ↓ Shock	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX.	5	250	498.733	510.78	485.15	5.445	515.058	OK
		After Vibration	AWG#40 ΔR=40mΩ MAX.			1.309	5.63	-4.73	2.168	7.813	OK
		After Shock	AWG#40 ΔR=40mΩ MAX.			0.956	8.14	-5.87	2.787	9.317	OK
		Initial	AWG#34 180mΩMAX.	5	250	143.286	150.45	138.23	2.440	150.606	OK
		After Vibration	AWG#34 ΔR=40mΩ MAX.			0.320	6.02	-5.01	2.416	7.568	OK
		After Shock	AWG#34 ΔR=40mΩ MAX.			0.192	5.78	-5.34	2.473	7.611	OK
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	15.947	16.61	14.56	0.622	17.813	OK
		After Vibration	ΔR=40mΩ MAX.			0.245	1.10	-0.46	0.536	1.853	OK
		After Shock	ΔR=40mΩ MAX.			0.673	1.66	0.06	0.504	2.185	OK
	Electrical discontinuity	During Vibration	1μsec. MAX.	5	5	No Electrical discontinuity					OK
		During Shock				No Electrical discontinuity					OK
	Appearance	After Vibration	No abnormality adversely affecting the performance shall not occur.	5	5	No Abnormality					OK
		After Shock				No Abnormality					OK
E Group Thermal Shock	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX.	5	250	497.726	511.48	485.01	5.734	514.928	OK
		After Testing	AWG#40 ΔR=40mΩ MAX.			1.435	4.78	-3.18	1.575	6.160	OK
		Initial	AWG#34 180mΩMAX.	5	250	143.492	151.59	136.65	2.701	151.595	OK
		After Testing	AWG#34 ΔR=40mΩ MAX.			-0.303	3.28	-6.09	1.751	4.950	OK
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	16.019	16.59	15.34	0.418	17.273	OK
		After Testing	ΔR=40mΩ MAX.			0.429	1.44	-0.89	0.640	2.349	OK

Table.2-4 Test result

Test Item	Contents of Measurement		Specifications	Set	N	Data					Judge
						AVE.	MAX.	MIN.	s	X±3s	
F Group High Temperature Life	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX	5	250	497.726	511.48	485.01	5.734	514.928	OK
		After Testing	AWG#40 ΔR=40mΩ MAX.			1.435	4.78	-3.18	1.575	6.160	OK
		Initial	AWG#34 180mΩMAX	5	250	143.514	150.39	138.89	2.237	150.225	OK
		After Testing	AWG#34 ΔR=40mΩ MAX.			-0.121	4.87	-5.01	1.955	5.744	OK
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	16.019	16.59	15.34	0.418	17.273	OK
		After Testing	ΔR=40mΩ MAX.			0.429	1.44	-0.89	0.640	2.349	OK
G Group Humidity (Steady State)	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX	5	250	498.135	509.32	486.10	5.350	514.185	OK
		After Testing	AWG#40 ΔR=40mΩ MAX.			0.191	5.53	-4.61	2.131	6.584	OK
		Initial	AWG#34 180mΩMAX	5	250	143.504	151.59	137.20	2.719	151.661	OK
		After Testing	AWG#34 ΔR=40mΩ MAX.			-0.322	3.36	-4.16	1.731	4.861	OK
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	15.762	16.76	14.89	0.568	17.466	OK
		After Testing	ΔR=40mΩ MAX.			0.793	1.93	0.10	0.560	2.473	OK
	Insulation Resistance (MΩ)	Initial	1000MΩMIN.	5	100	4.0×10 ⁵ MΩMIN.					OK
		After Testing	500MΩMIN.			2.0×10 ⁴ MΩMIN.					OK
	D. W. Voltage	Initial	No abnormality adversely affecting the performance shall not occur.	5	100	No Abnormality					OK
		After Testing				No Abnormality					OK

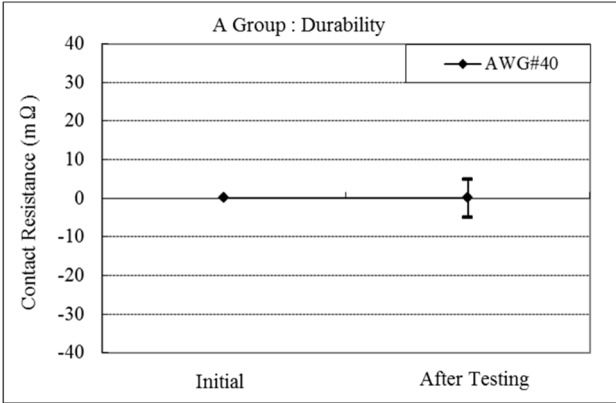
Table.2-5 Test result

Test Item	Contents of Measurement		Specifications	Set	N	Data					Judge
						AVE.	MAX.	MIN.	s	X±3s	
H Group Humidity (Cycling)	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX.	5	250	498.408	511.48	485.15	5.922	516.174	OK
		After Durability	AWG#40 ΔR=40mΩ MAX.			1.047	5.63	-4.73	2.008	7.071	OK
		After Testing	AWG#40 ΔR=40mΩ MAX.			1.564	5.68	-5.73	2.183	8.113	OK
		Initial	AWG#34 180mΩMAX.	5	250	143.155	151.59	136.74	2.804	151.567	OK
		After Durability	AWG#34 ΔR=40mΩ MAX.			-0.294	4.04	-3.98	1.736	4.914	OK
		After Testing	AWG#34 ΔR=40mΩ MAX.			0.277	6.42	-4.79	2.325	7.252	OK
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	16.295	17.12	15.89	0.382	17.441	OK
		After Durability	ΔR=40mΩ MAX.			0.680	1.54	-0.21	0.7726	2.858	OK
		After Testing	ΔR=40mΩ MAX.			0.233	1.39	-1.16	0.898	2.927	OK
	Insulation Resistance (MΩ)	Initial	1000MΩMIN.	5	100	2.0×10 ⁵ MΩMIN.					OK
		After Testing	500MΩMIN.			1.0×10 ⁴ MΩMIN.					OK
	D. W. Voltage	Initial	No abnormality adversely affecting the performance shall not occur.	5	100	No Abnormality					OK
		After Testing				No Abnormality					OK
J Group Salt Water Spray	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX.	5	250	497.633	509.25	485.01	5.478	514.067	OK
		After Testing	AWG#40 ΔR=40mΩ MAX.			0.626	5.87	-4.84	2.112	6.962	OK
		Initial	AWG#34 180mΩMAX.	5	250	143.607	150.67	136.65	2.773	151.926	OK
		After Testing	AWG#34 ΔR=40mΩ MAX.			-0.322	4.30	-4.38	1.787	5.029	OK
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	15.856	17.45	15.23	0.680	17.896	OK
		After Testing	ΔR=40mΩ MAX.			0.868	2.23	-0.54	0.843	3.397	OK

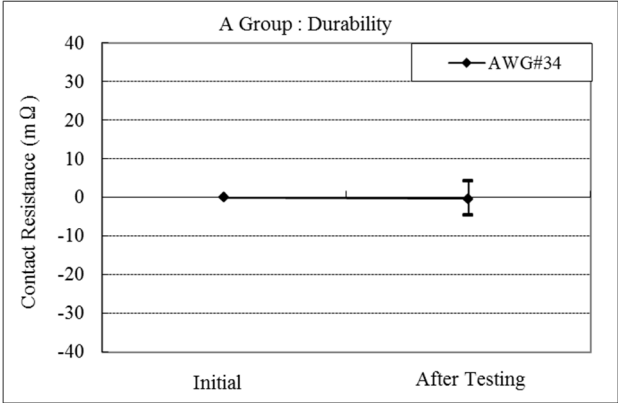
Table.2-6 Test result

Test Item	Contents of Measurement		Specifications	Set	N	Data					Judge
						AVE.	MAX.	MIN.	s	$\bar{X} \pm 3s$	
K Group Gas(H ₂ S)	Contact Resistance (mΩ)	Initial	AWG#40 600mΩMAX.	5	250	497.687	509.25	484.57	5.717	514.838	OK
		After testing	AWG#40 ΔR=40mΩ MAX.			0.826	5.87	-4.84	2.301	7.729	OK
		Initial	AWG#34 180mΩMAX.	5	250	143.257	151.59	136.65	2.519	150.814	OK
		After Testing	AWG#34 ΔR=40mΩ MAX.			-0.110	4.87	-5.01	1.970	5.800	OK
	GND Resistance (mΩ)	Initial	50mΩMAX.	5	5	16.143	17.11	15.15	0.588	17.907	OK
		After Testing	ΔR=40mΩ MAX.			0.922	1.69	0.02	0.570	2.632	OK
L Group Solderability	Appearance		More than 95% of the dipped surface shall be evenly wet.	10	10	Wet 95% MIN.					OK
M Group Soldering Heat Resistance	Appearance		No abnormality adversely affecting the performance shall not occur.	10	10	No Abnormality					OK
N Group Temperature Rising	AWG#40 0.3A/Contact 9.0A/Connector		ΔT=30°C MAX.	5	5	ΔT=28.5°C MAX.					OK

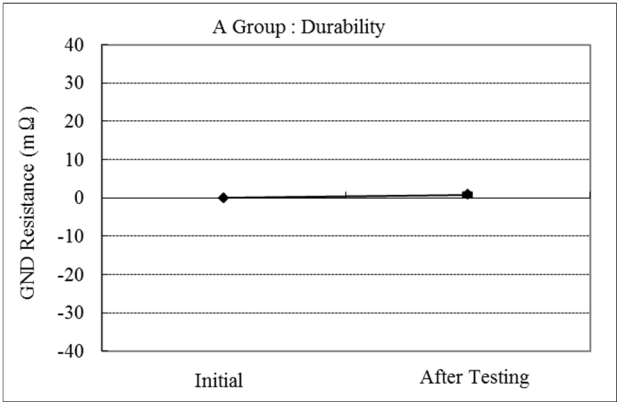
*The Temperature Rising Test is a result when applied ratings current (0.3A/contact) between the neighboring contacts for 30pos.
(With the whole connector 9.0A.)



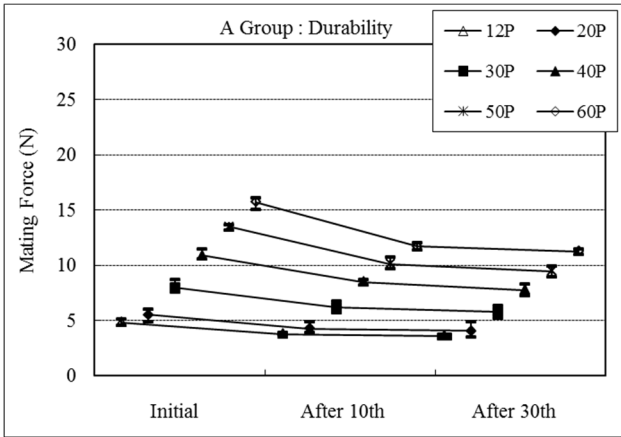
Graph.1



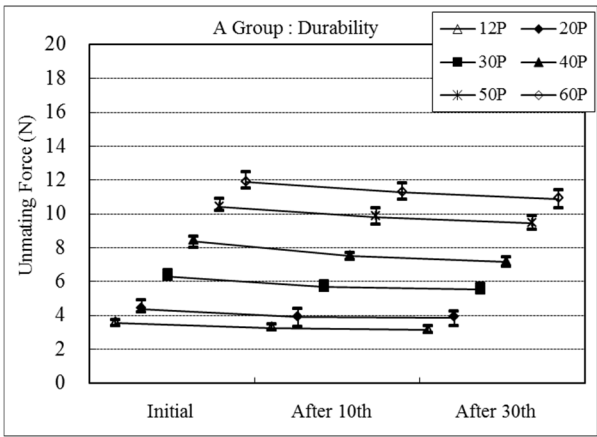
Graph.2



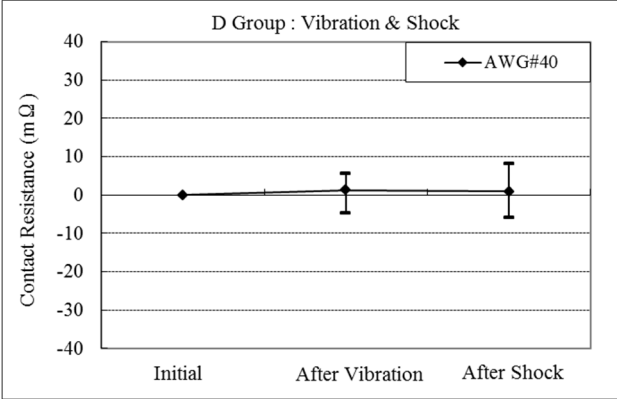
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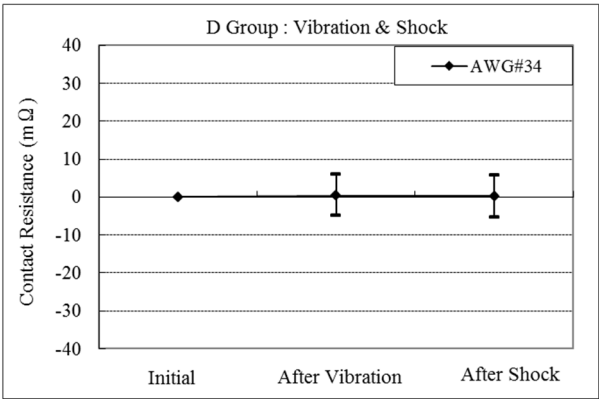
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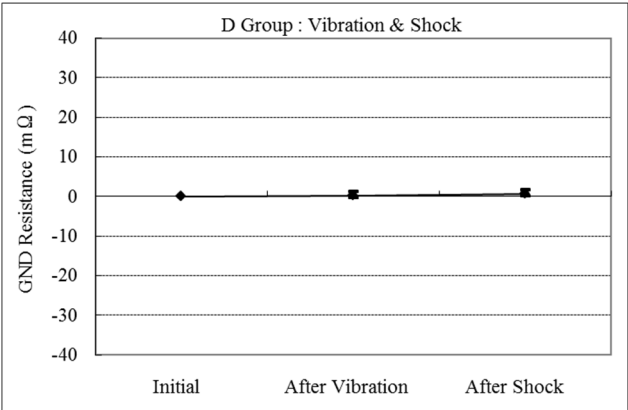
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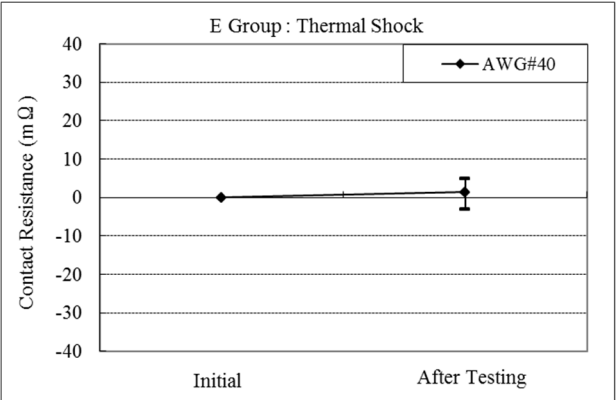
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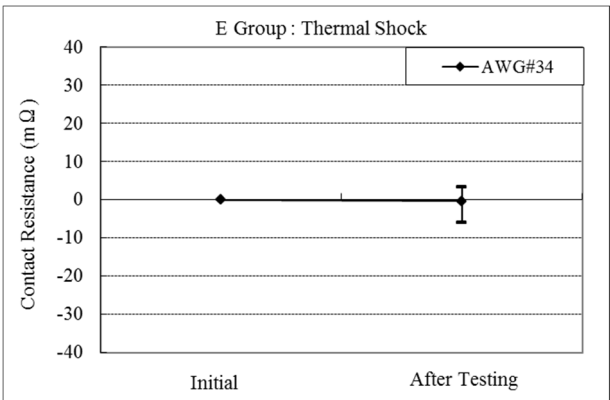
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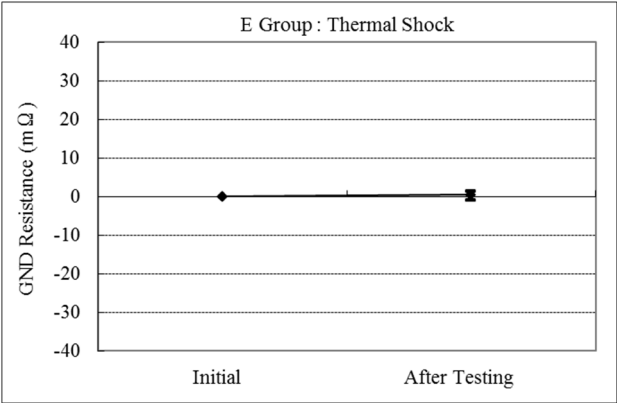
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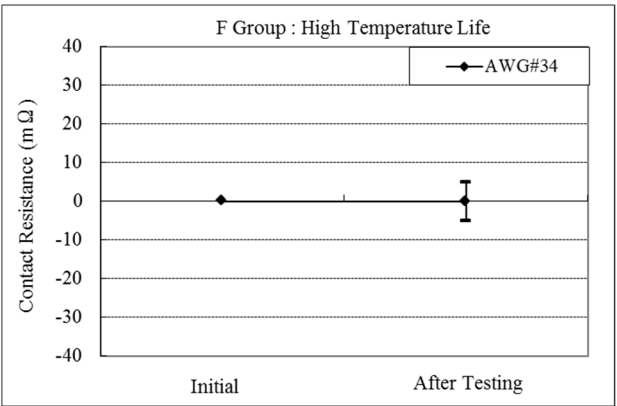
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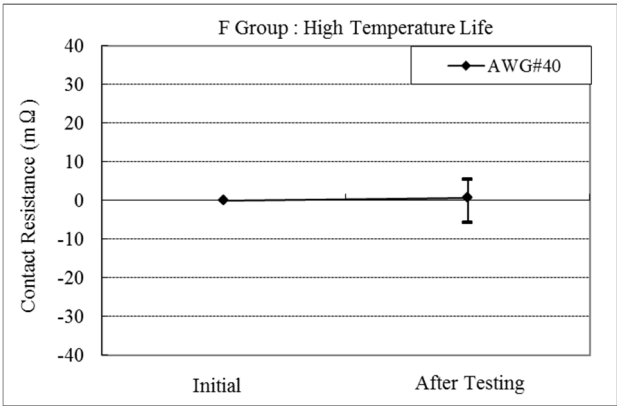
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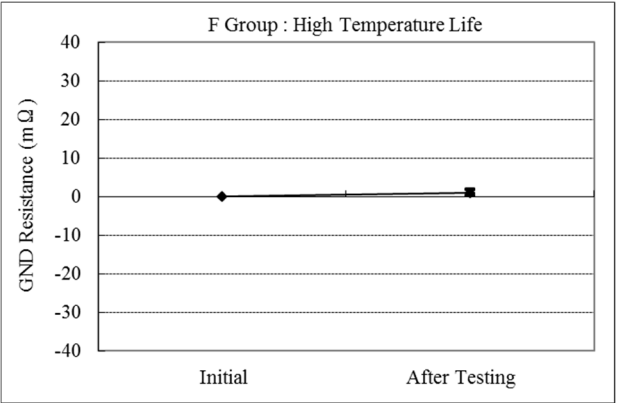
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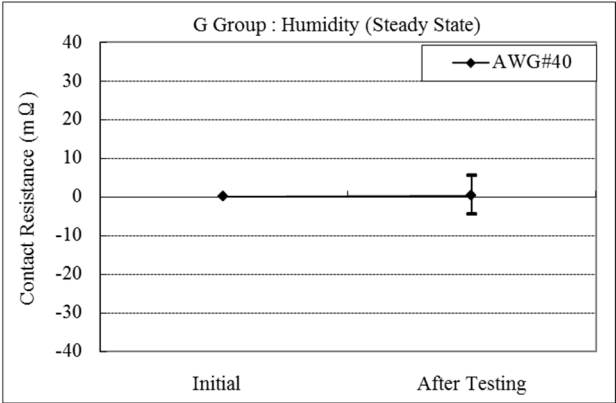
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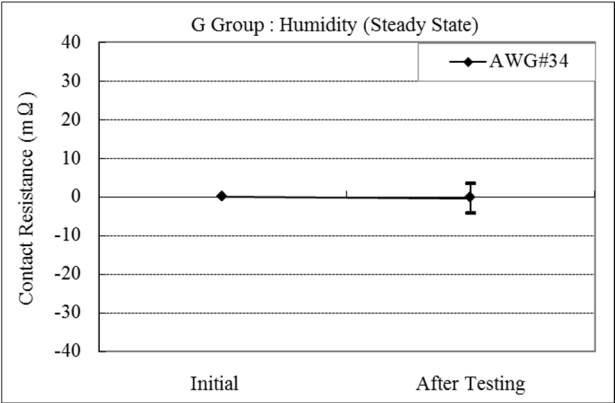
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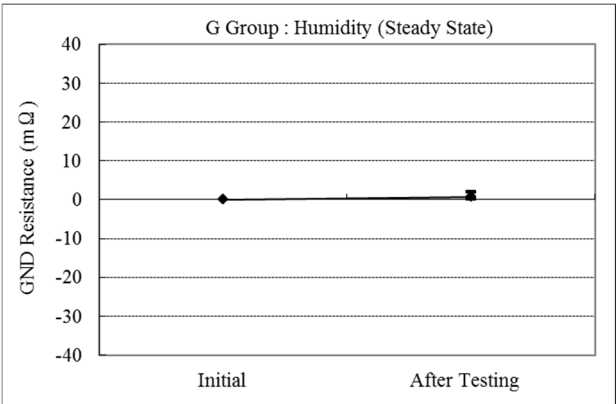
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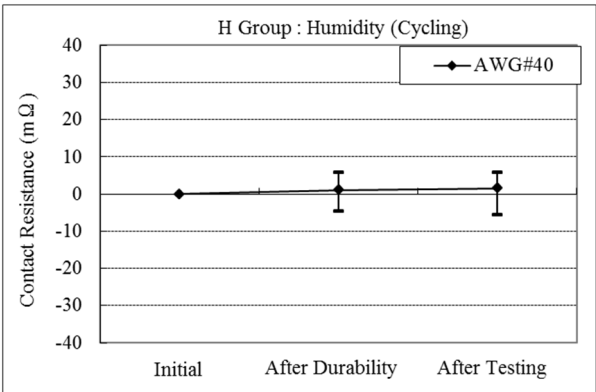
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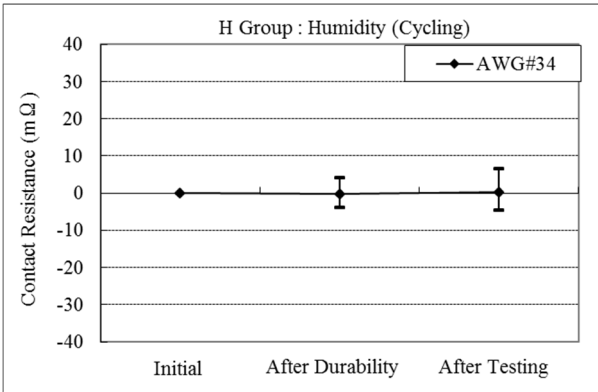
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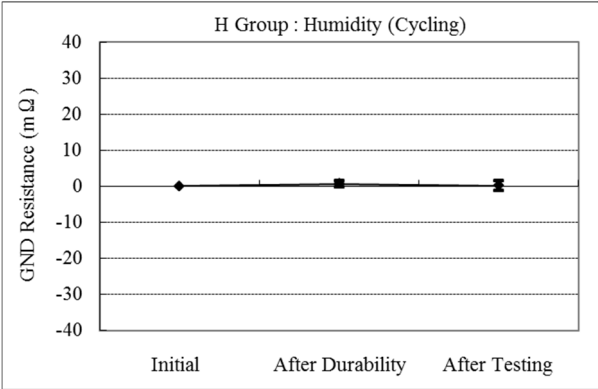
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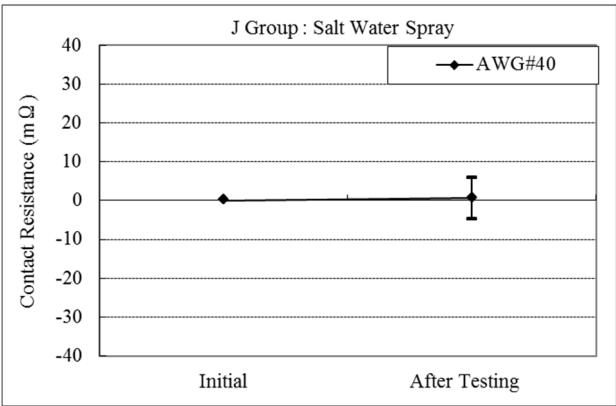
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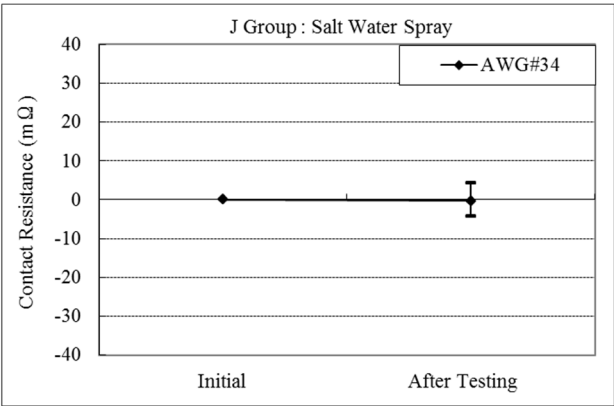
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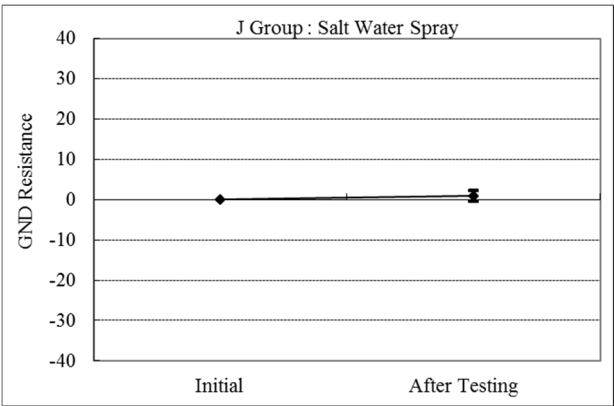
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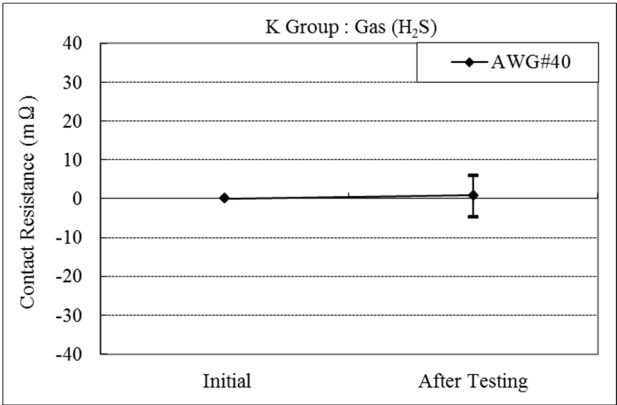
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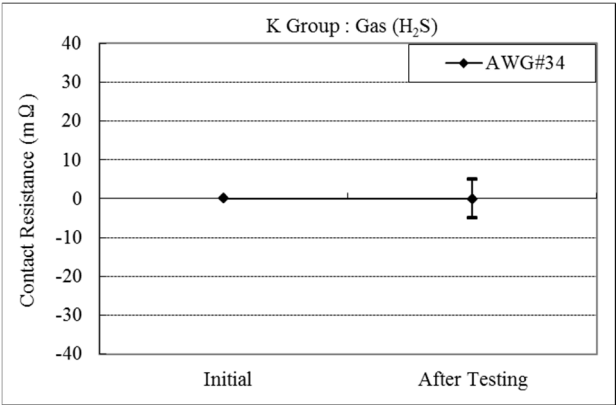
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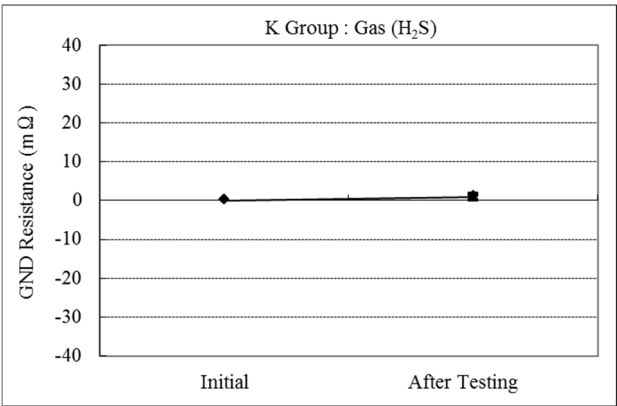
Graph.23



Graph.24



Graph.25



Graph.26