

EVAFLEX® 5-SE-GVT

(0.5mm pitch FPC/FFC Conn.)

Part No. 20799-0**E-01

Test Report

Product Specification no. PRS-2305

2	T23035	June 20, 2023	M. Muro	-	H. Ikari
1	T22016	January 19, 2022	M. Muro	-	H. Ikari
0	T20040	July 1, 2020	T. Tanigawa	T. Kurachi	Y. Shimada
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of EVAFLEX 5-SE-GVT Connector in accordance with PRS-2305.

2. Specimen

(1) Connector : EVAFLEX 5-SE-GVT (P/N : 20799-0**E-01)

(2) FFC : Made by Sumitomo Electric Industries, Ltd. Thickness Lead : $t=0.3\pm 0.03$ ※Actual measurement: 0.315~0.320mm

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 11.

For the details of the testing conditions and requirements, see PRS-2305.

The "n" in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-2305.

Table 1 Test Sequence and Sample Quantity

Test Item	Group														
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
Contact Resistance		2,6				1,3,5	1,3,5,7	1,3	1,3	1,5	1,5	1,3	1,3		
Insulation Resistance										2,6	2,6				
D. W. Voltage										3,7	3,7				
Temperature rising	1														
Mating Force		1,5													
Un-mating Force		3,7													
Durability		4					2 (10 cycles)								
Contact Retention Force			1												
Hold down Retention Force				1											
FPC/FFC Retention Force					1										
Vibration (1)						2									
Shock (1)						4									
Vibration (2) & Shock (2)							4,6								
Thermal Shock								2							
High Temperature Life									2						
Humidity (Steady State)										4					
Humidity (Cycling)											4				
Salt Water Spray												2			
H2S Gas													2		
Solder ability														1	
Soldering Heat Resistance															1
Specimen Quantity.	5 pcs.	5 pcs.	20 pos.	10 pos.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	10 pcs.	10 pcs.

※Numbers indicate test sequences

Table 2-1 Test Result

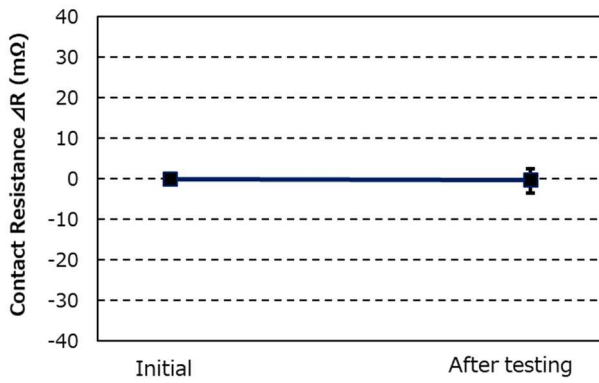
Test Item	Measurements		Spec.	Set	n	Data					Judge
						AVG.(X)	MAX.	MIN.	s	X±3s	
A Group Temperature rise	50P	0.35A/pin	ΔT=30K(°C) MAX.	5	5	ΔT=16.7K(°C) MAX.					OK
B Group Durability	20P	Contact resistance (mΩ)	Initial	5	250	6.613	9.50	4.11	1.051	9.766	OK
			I/W 50cycles	5	250	-0.238	2.59	-3.55	1.182	3.308	OK
	20P	Insertion force (N)	Initial	5	5	10.306	10.82	9.91	0.414	11.548	OK
			I/W 50cycles	5	5	6.430	6.88	6.11	0.288	7.294	OK
	20P	Withdrawal force (N)	Initial	5	5	3.834	4.25	3.34	0.399	2.637	OK
			I/W 50cycles	5	5	3.776	3.91	3.49	0.172	3.260	OK
	30P	Insertion force (N)	Initial	5	5	15.094	15.74	14.52	0.449	16.441	OK
			I/W 50cycles	5	5	9.140	9.38	8.94	0.200	9.740	OK
	30P	Withdrawal force (N)	Initial	5	5	5.686	5.93	5.37	0.234	4.984	OK
			I/W 50cycles	5	5	5.588	6.08	5.11	0.452	4.232	OK
	40P	Insertion force (N)	Initial	5	5	20.312	21.14	19.11	0.793	22.691	OK
			I/W 50cycles	5	5	12.392	12.93	11.37	0.608	14.216	OK
	40P	Withdrawal force (N)	Initial	5	5	7.198	7.58	6.68	0.345	6.163	OK
			I/W 50cycles	5	5	7.104	7.43	6.49	0.367	6.003	OK
	50P	Insertion force (N)	Initial	5	5	23.972	24.63	22.99	0.685	26.027	OK
			I/W 50cycles	5	5	14.668	15.09	14.29	0.379	15.805	OK
	50P	Withdrawal force (N)	Initial	5	5	9.008	9.28	8.76	0.198	8.414	OK
			I/W 50cycles	5	5	8.950	9.70	7.98	0.624	7.078	OK
	60P	Insertion force (N)	Initial	5	5	27.196	27.85	26.32	0.559	28.873	OK
			I/W 50cycles	5	5	17.334	17.84	16.92	0.435	18.639	OK
60P	Withdrawal force (N)	Initial	5	5	10.780	11.27	9.84	0.557	9.109	OK	
		I/W 50cycles	5	5	10.798	11.52	9.84	0.803	8.389	OK	
C Group Contact retention force (N)			0.30N MIN.	-	20	0.987	1.30	0.73	0.147	0.546	OK
D Group Hold down retention force (N)			1.47N MIN.	-	10	12.459	12.97	11.78	0.383	11.310	OK

Table 2-2 Test Result

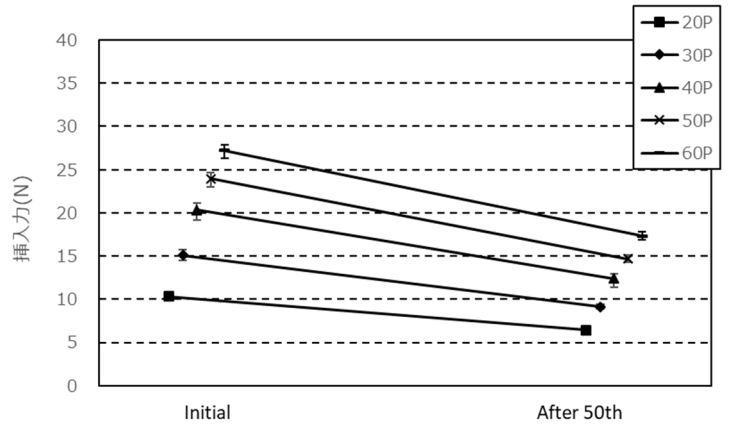
Test Item	Measurements		Spec.	Set	n	Data					Judge	
						AVG.(X)	MAX.	MIN.	s	X±3s		
E Group FPC/FFC retention force	20P	FFC retention force (N)	11.0N MIN.	5	5	21.852	22.99	20.83	0.871	19.239	OK	
		Appearance	No abnormality in the lock part	5	5	No abnormality					OK	
	30P	FFC retention force (N)	11.7N MIN.	5	5	23.694	24.07	23.08	0.479	22.257	OK	
		Appearance	No abnormality in the lock part	5	5	No abnormality					OK	
	40P	FFC retention force (N)	12.4N MIN.	5	5	24.856	25.69	24.39	0.509	23.329	OK	
		Appearance	No abnormality in the lock part	5	5	No abnormality					OK	
	50P	FFC retention force (N)	13.1N MIN.	5	5	27.874	28.76	26.74	0.724	25.702	OK	
		Appearance	No abnormality in the lock part	5	5	No abnormality					OK	
	60P	FFC retention force (N)	13.8N MIN.	5	5	28.886	29.37	28.31	0.395	27.701	OK	
		Appearance	No abnormality in the lock part	5	5	No abnormality					OK	
	F Group Vibration (1) ↓ Shock (1)	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	250	6.722	9.56	4.05	1.321	10.685	OK
			After vibration	ΔR=40mΩ MAX.	5	250	-0.395	4.97	-5.55	2.102	5.911	OK
After shock			ΔR=40mΩ MAX.	5	250	-0.318	6.32	-5.50	2.235	6.387	OK	
Discontinuity		During vibration	1μs MAX.	5	5	No discontinuity					OK	
		During shock		5	5	No discontinuity					OK	
Appearance		After vibration	No abnormality adversely affecting the performance shall occur.	5	5	No abnormality					OK	
		After shock		5	5	No abnormality					OK	
G Group Vibration (2) ↓ Shock (2)		Contact resistance (mΩ)	Initial	60mΩ MAX.	5	200	8.138	13.92	2.07	2.629	16.025	OK
	After durability		ΔR=40mΩ MAX.	5	200	-0.236	4.40	-5.29	2.092	6.040	OK	
	After vibration		ΔR=40mΩ MAX.	5	200	0.369	11.01	-7.51	3.576	11.097	OK	
	After shock		ΔR=40mΩ MAX.	5	200	0.452	8.68	-8.55	3.155	9.917	OK	
	Discontinuity	During vibration	1μs MAX.	5	5	No discontinuity					OK	
		During shock		5	5	No discontinuity					OK	
	Appearance	After vibration	No abnormality adversely affecting the performance shall occur.	5	5	No abnormality					OK	
		After shock		5	5	No abnormality					OK	
H Group Thermal shock	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	250	6.704	9.03	4.05	1.035	9.809	OK	
		After testing	ΔR=40mΩ MAX.	5	250	-0.477	4.54	-5.17	1.838	5.037	OK	
	Appearance	No abnormality adversely affecting the performance shall occur.	5	5	No abnormality					OK		

Table 2-3 Test Result

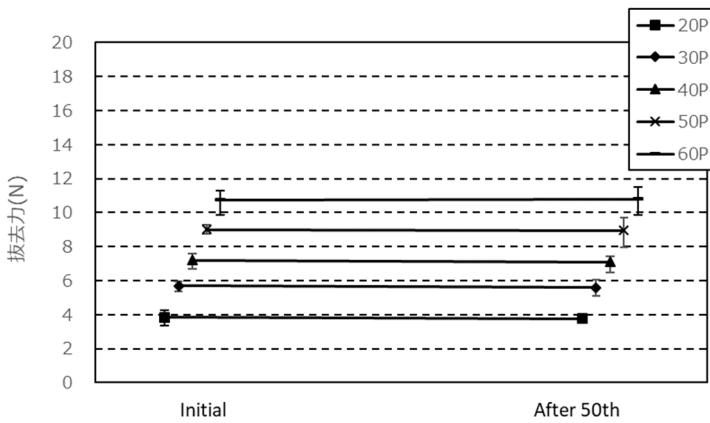
Test Item	Measurements		Spec.	Set	n	Data					Judge
						AVG.(X)	MAX.	MIN.	s	X±3s	
J Group High temperature life	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	250	6.616	8.80	4.18	1.104	9.928	OK
		After testing	ΔR=40mΩ MAX.	5	250	1.101	8.72	-4.70	2.588	8.865	OK
	Appearance		No abnormality adversely affecting the performance shall occur.	5	5	No abnormality					OK
K Group Humidity (Steady State)	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	250	6.717	9.80	4.14	1.193	10.296	OK
		After testing	ΔR=40mΩ MAX.	5	250	1.149	5.74	-3.31	1.604	5.961	OK
	Insulation resistance (Contact-Contact)	Initial	500MΩ MIN.	5	5	1.0×10 ⁴ MΩ MIN.					OK
		After testing		5	5	1.6×10 ⁴ MΩ MIN.					OK
	Dielectric strength (Contact-Contact)	Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur.	5	5	No abnormality					OK
		After testing		5	5	No abnormality					OK
Appearance		No abnormality adversely affecting the performance shall occur.	5	5	No abnormality					OK	
L Group Humidity (Cycling)	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	250	6.688	9.53	4.04	1.323	10.657	OK
		After testing	ΔR=40mΩ MAX.	5	250	-0.522	4.31	-5.67	2.051	5.631	OK
	Insulation resistance (Contact-Contact)	Initial	500MΩ MIN.	5	5	5.4×10 ⁴ MΩ MIN.					OK
		After testing		5	5	1.0×10 ⁴ MΩ MIN.					OK
	Dielectric strength (Contact-Contact)	Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur.	5	5	No abnormality					OK
		After testing		5	5	No abnormality					OK
Appearance		No abnormality adversely affecting the performance shall occur.	5	5	No abnormality					OK	
M Group Salt water spray	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	250	6.742	9.13	4.21	1.302	10.648	OK
		After testing	ΔR=40mΩ MAX.	5	250	0.509	6.92	-5.64	2.168	7.013	OK
	Appearance		No abnormality adversely affecting the performance shall occur.	5	5	No abnormality					OK
N Group H ₂ S gas	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	250	6.712	9.19	4.08	1.237	10.423	OK
		After testing	ΔR=40mΩ MAX.	5	250	-0.362	4.66	-5.90	2.158	6.112	OK
	Appearance		No abnormality adversely affecting the performance shall occur.	5	5	No abnormality					OK
P Group Solder ability	Appearance		Wetness: 95% MIN.	10	10	95%MIN.was wet.					OK
Q Group Solder heat resistance	Appearance		No abnormality adversely affecting the performance shall occur.	10	10	No abnormality					OK



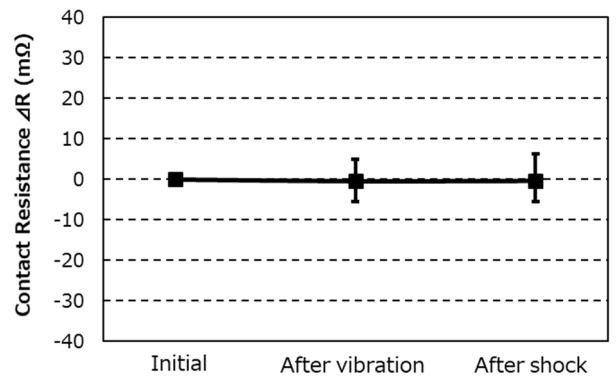
Graph1 .A change of contact resistance
(B Group : Durability)



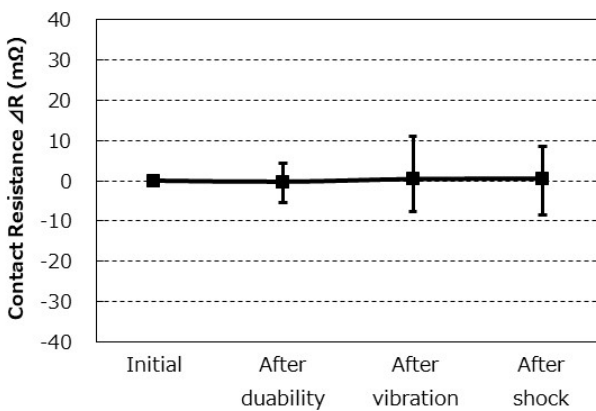
Graph2. A change of mating force
(B Group : Durability)



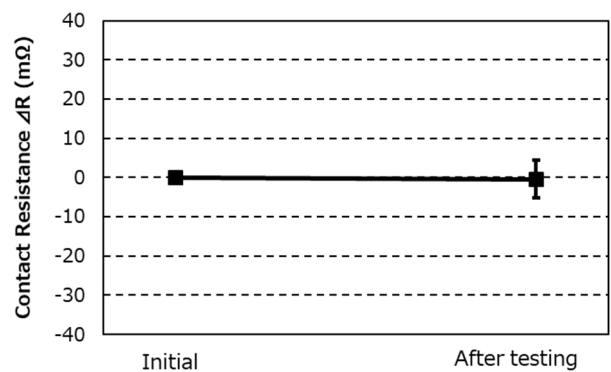
Graph3. A change of un mating force
(B Group : Durability)



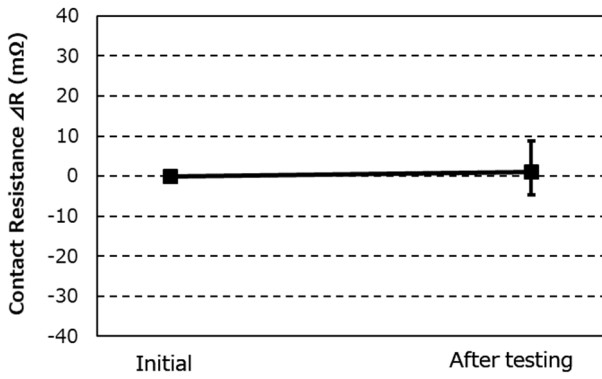
Graph4. A change of contact resistance
(F Group : Vibration (1) → Shock (1))



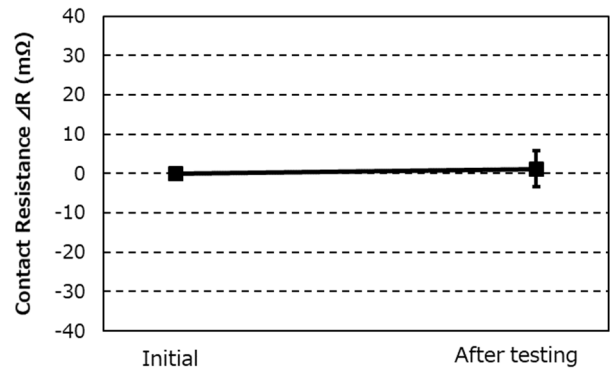
Graph5. A change of contact resistance
(G Group : Vibration (2) → Shock (2))



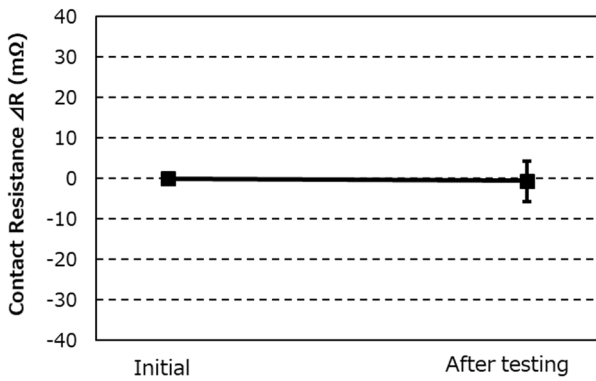
Graph6. A change of contact resistance
(H Group : Thermal shock)



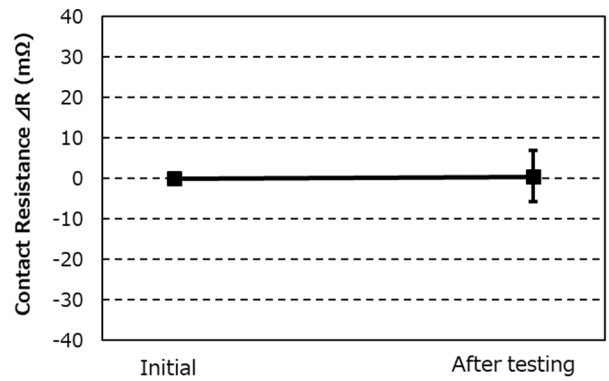
Graph7. A change of contact resistance
(J Group : High temperature life)



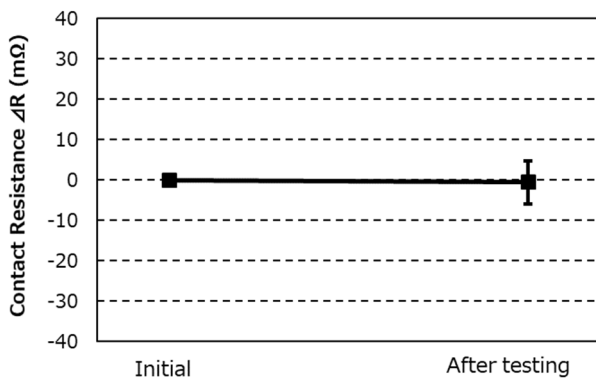
Graph8. A change of contact resistance
(K Group : Humidity (Steady state))



Graph9. A change of contact resistance
(L Group : Humidity (Cycling))



Graph10. A change of contact resistance
(M Group : Salt water spray)



Graph11. A change of contact resistance
(N Group : H²S gas)