

EVAFLEX® 5-HD

Part No. 20952-024E-02

Test Report

Product Specification no. PRS-2645

Rev.	ECN	Date	Prepared by	Checked by	Approved by
1	T22023	January 24, 2022	M.Muro	-	H.Ikari
0	T20041	July 2, 2020	H.Kaneko	M.Muro	Y.Shimada

1. Purpose

To evaluate the performance of EVAFLEX 5-HD Connector in accordance with PRS-2645.

2. Specimen

(1) Connector : EVAFLEX 5-HD (P/N : 20952-024E-02)

(2) FFC : Made by Totoku Electric Co., Ltd.

Thickness Lead : $t=0.33\pm 0.03$ (Actual measurement : 0.348~0.352mm)

3. Test Sequence

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

4. Result

See Table 2-1 to 2-2, Graph 1 to 11. For the details of the testing conditions and requirements, see PRS-2645.

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

5. Conclusion

All the specimens met the requirements of PRS-2645.

Table 1 Test Sequence and Sample Quantity

Test Item	Group													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
Contact Resistance	2,6				1,3,5	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													
FFC Retention Force		1												
CONTACT Retention Force			1											
SHELL Retention Force				1										
Vibration					2									
Shock					4									
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 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	10 pcs.	10 pcs.	5 pcs.

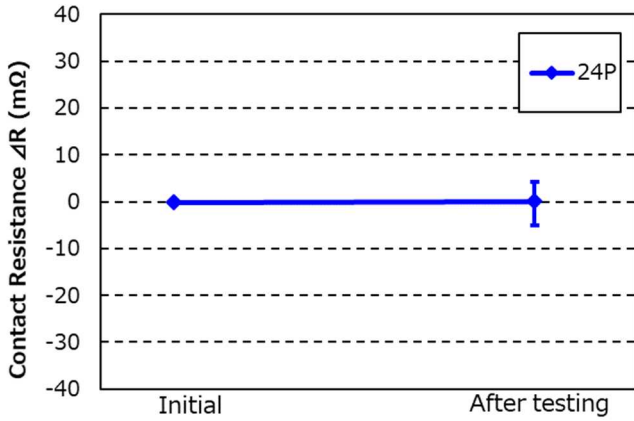
※グループ表中の番号は、試験順序を示す。 / Numbers indicate test sequences

Table 2-1 Test Result

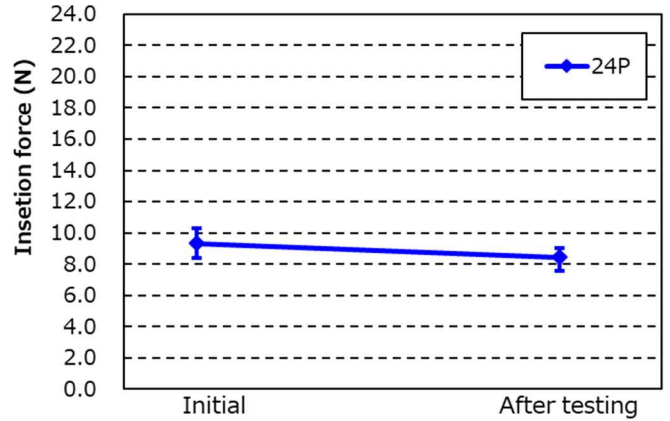
Test Item	Measurements		Spec.	Set	n	Data					Judge	
						AVG.(X)	MAX.	MIN.	s	X±3s		
A Group Durability	24P	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	120	5.754	8.42	3.03	1.078	8.988	OK
			I/W 30cycles	ΔR=40mΩ MAX.	5	120	0.046	4.14	-5.05	1.632	6.574	OK
		Mating force (N)	Initial	14.0N MAX.	5	-	9.313	10.29	8.37	0.777	11.644	OK
			I/W 30cycles		5	-	8.448	9.05	7.55	0.562	10.134	OK
		Un-mating force (N)	Initial	2.30N MIN.	5	-	6.507	6.90	5.94	0.400	5.307	OK
			I/W 30cycles		5	-	6.823	7.86	6.34	0.658	4.849	OK
B Group FFC retention force	24P	FFC retention force (N)	Initial	8.50N MIN.	5	-	19.501	19.65	19.32	0.141	19.078	OK
		Appearance	No abnormality adversely affecting the performance shall occur.		5	-	No abnormality					OK
C Group CONTACT retention force (N)				0.30N MIN.	-	20	0.957	1.13	0.82	0.077	0.726	OK
D Group SHELL retention force (N)				1.50N MIN.	-	5	3.146	3.29	2.93	0.145	2.711	OK
E Group Vibration ↓ Shock	24P	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	120	6.716	10.98	3.08	1.484	11.168	OK
			After vibration	ΔR=40mΩ MAX.	5	120	0.097	5.34	-5.43	2.101	8.501	OK
			After shock		5	120	-0.039	6.38	-5.66	2.195	8.741	OK
		Discontinuity	During vibration	1μs MAX.	No discontinuity					OK		
			During shock		No discontinuity					OK		
		Appearance	After vibration	No abnormality adversely affecting the performance shall occur.	No abnormality					OK		
After shock	No abnormality					OK						
F Group Thermal shock	24P	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	120	6.247	10.85	3.27	1.635	11.152	OK
			After testing	ΔR=40mΩ MAX.	5	120	-0.416	2.03	-3.00	0.954	3.400	OK
		Appearance	No abnormality adversely affecting the performance shall occur.		5	-	No abnormality					OK
G Group High temperature life	24P	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	120	5.373	9.36	2.30	1.398	9.567	OK
			After testing	ΔR=40mΩ MAX.	5	120	-0.407	1.50	-2.78	0.826	2.897	OK
		Appearance	No abnormality adversely affecting the performance shall occur.		5	-	No abnormality					OK

Table 2-2 Test Result

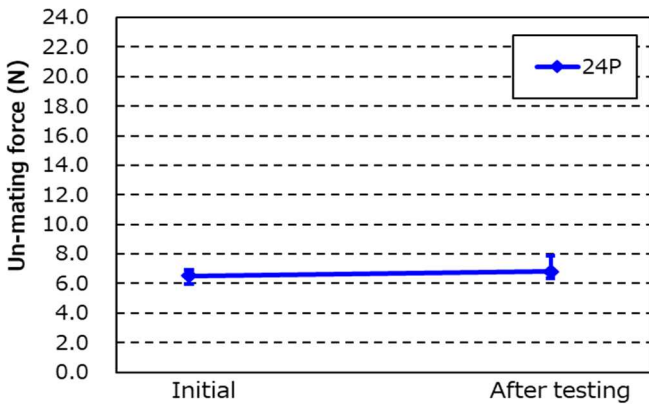
Test Item	Measurements		Spec.	Set	n	Data					Judge	
						AVG.(X)	MAX.	MIN.	s	X±3s		
H Group Humidity (Steady state)	24P	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	120	6.162	9.99	2.58	1.569	10.869	OK
			After testing	ΔR=40mΩ MAX.	5	120	-0.161	2.38	-2.94	0.922	3.527	OK
	24P	Insulation resistance (Contact-Contact)	Initial	100MΩ MIN.	5	115	1.26×10 ⁶ MΩ					OK
			After testing		5	115	1.00×10 ⁵ MΩ					OK
	24P	Dielectric strength (Contact-Contact)	Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur.	5	115	No abnormality					OK
			After testing		5	115	No abnormality					OK
	24P		Appearance	No abnormality adversely affecting the performance shall occur.	5	-	No abnormality					OK
J Group Humidity (Steady state)	24P	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	120	6.597	10.61	4.19	1.368	10.701	OK
			After testing	ΔR=40mΩ MAX.	5	120	-0.569	1.66	-2.75	0.845	2.811	OK
	24P	Insulation resistance (Contact-Contact)	Initial	100MΩ MIN.	5	115	1.36×10 ⁶ MΩ					OK
			After testing		5	115	1.13×10 ⁵ MΩ					OK
	24P	Dielectric strength (Contact-Contact)	Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur.	5	115	No abnormality					OK
			After testing		5	115	No abnormality					OK
	24P		Appearance	No abnormality adversely affecting the performance shall occur.	5	-	No abnormality					OK
K Group Salt water spray	24P	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	120	6.140	9.55	4.07	1.389	10.307	OK
			After testing	ΔR=40mΩ MAX.	5	120	-0.453	1.65	-2.70	0.810	2.787	OK
	24P		Appearance	No abnormality adversely affecting the performance shall occur.	5	-	No abnormality					OK
L Group H ₂ S gas	24P	Contact resistance (mΩ)	Initial	60mΩ MAX.	5	120	6.062	8.64	3.32	1.331	10.055	OK
			After testing	ΔR=40mΩ MAX.	5	120	0.580	4.85	-6.48	2.752	11.588	OK
	24P		Appearance	No abnormality adversely affecting the performance shall occur.	5	-	No abnormality					OK
M Group Solder ability	Appearance		No abnormality adversely affecting the performance shall occur.	10	-	No abnormality					OK	
N Group Solder heat resistance	Appearance		No abnormality adversely affecting the performance shall occur.	10	-	No abnormality					OK	
P Group Temperature rise	24P	0.30A/pin	ΔT=30K(°C) MAX.	5	-	7.70 °C MAX.					OK	



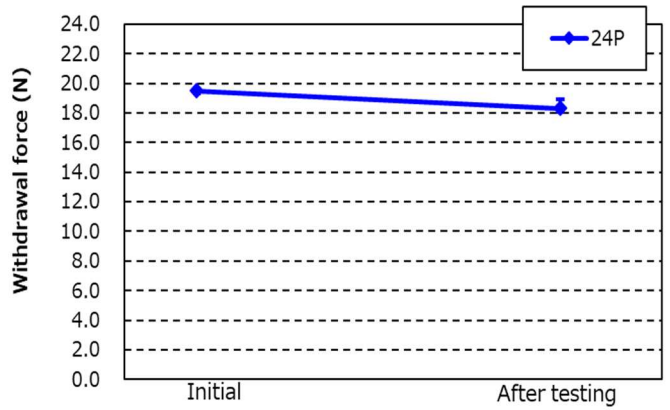
Graph1. A change of contact resistance
(A Group : Durability)



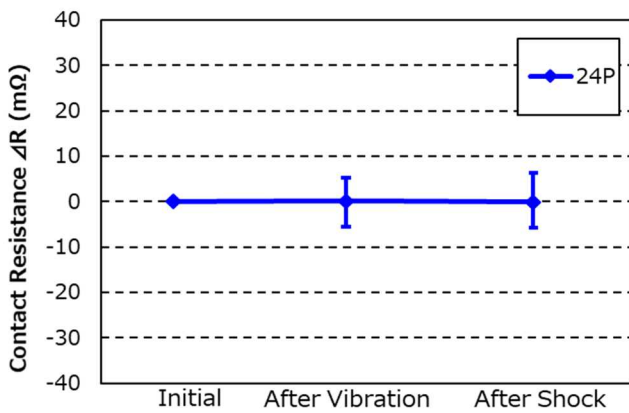
Graph2. A change Mating force
(A Group : Durability)



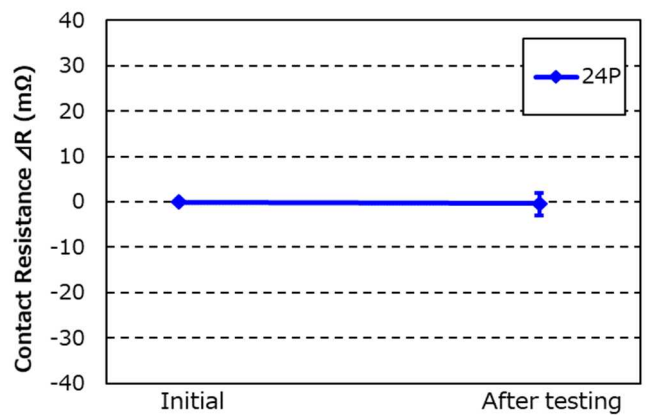
Graph3. A change of Un-mating force
(A Group : Durability)



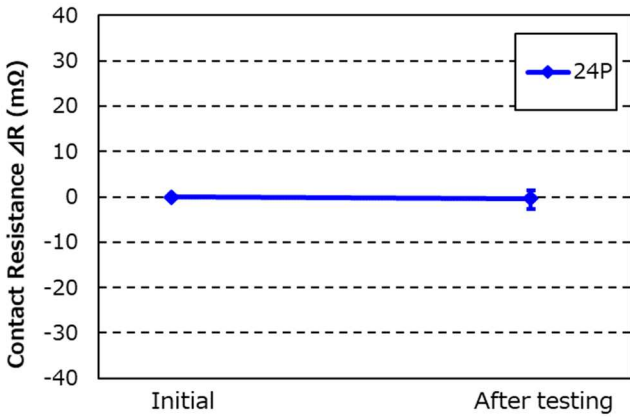
Graph4. A change of FFC retention force
(B Group : FFC retention force)



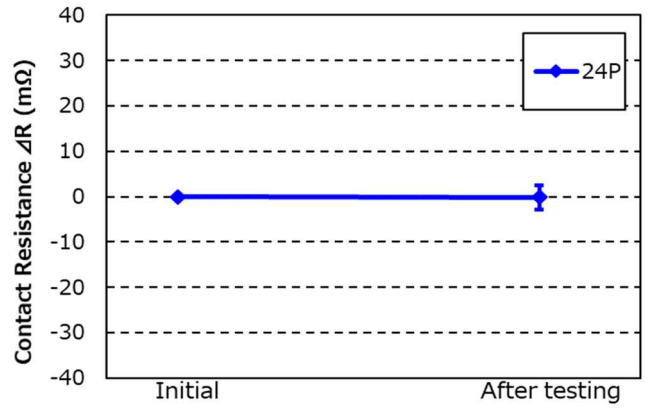
Graph5. A change of contact resistance
(E Group : Vibration and Shock)



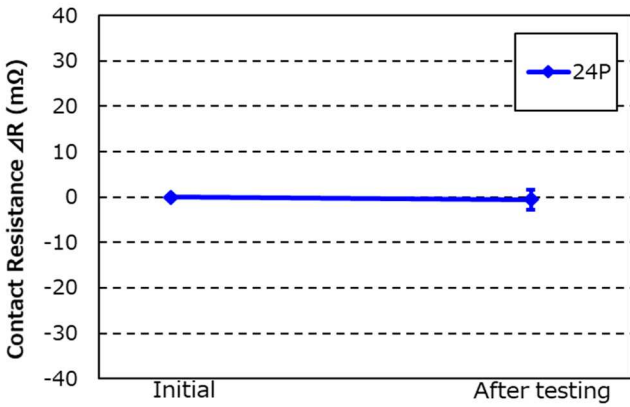
Graph6. A change of contact resistance
(F Group : Thermal Shock)



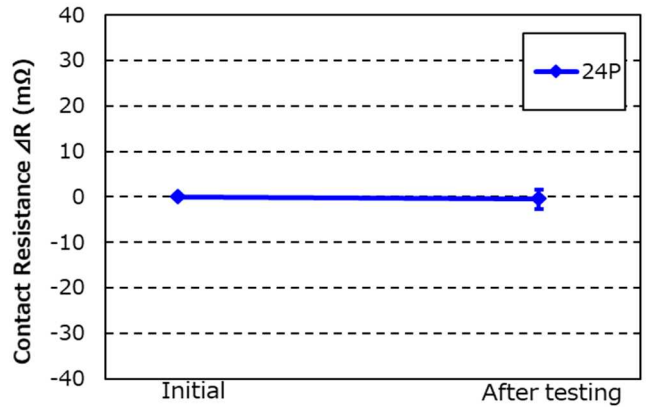
Graph7. A change of contact resistance
(G Group : High Temperature Life)



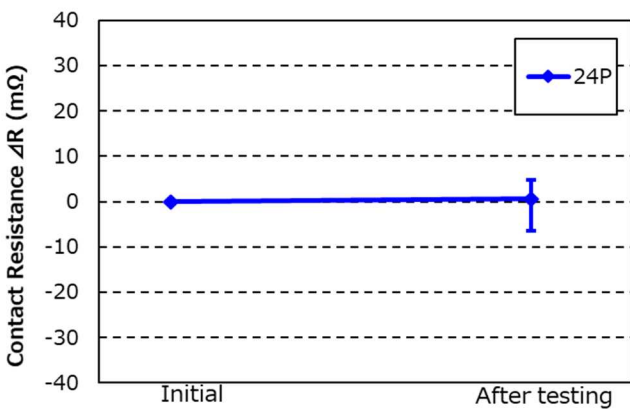
Graph8. A change of contact resistance
(H Group : Humidity < Steady State >)



Graph9. A change of contact resistance
(J Group : Humidity < Cycling >)



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



Graph11. A change of contact resistance
(L Group : H₂S Gas)