

MINIFLEX® 5-FF

Part No. 20647-0**E-01

Test Report

Product Specification no. PRS-2039

8	T22025	January 25, 2022	M.Muro	-	H.Ikari
7	T19133	October 2, 2019	S.Shigekoshi	M.Muro	H.Ikari
6	T17043	March 7, 2017	H.Kaneko	-	Y.Shimada
5	T16082	May 26, 2016	H.Kaneko	-	J.Tateishi
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of MINIFLEX 5-FF Connector in accordance PRS-2039.

2. Specimen

(1) Connector : MINIFLEX 5-FF Connector ··· P/N 20647-0**E-01

(2) FPC : Made by Taiyo Industrial Co.,Ltd.

Thickness Lead : $t=0.30\pm 0.05$ (Actual measurement : 0.292~0.296mm)

3. Test Sequence

All the evaluation was performed in accordance with Table. 1 Test Sequence.

4. Result

See Table 2-1~2-3. Graph 1~10. For the details of testing conditions and requirements, see PRS-2039.

5. Conclusion

All the specimen met the requirements of PRS-2039.

Table1 Test Sequence and Sample Quantity

Test Item	Group														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Contact Resistance	1,3			1,3,5	1,5	1,3	1,5	1,5	1,3	1,3	1,3	1,3			
Insulation Resistance					2,6		2,6	2,6							
D. W. Voltage					3,7		3,7	3,7							
Temp. Life															1
Cable Retention Force		1													
Contact Retention Force			1,3												
Hold down Retention Force			1,3												
Durability	2														
Vibration				2											
Shock				4											
Thermal Shock					4										
High Temp. Life			2			2									
Humidity (Steady State)							4								
Humidity (Cycling)								4							
Cold Temp. Life									2						
Salt Water Spray										2					
SO ₂ Gas											2				
H ₂ S Gas												2			
Solder ability													1		
Soldering Heat Resistance														1	
Sample QTY.	5 pcs.	5 pcs	20 pos	5 pcs.	5 pcs	5 pcs	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	10 pcs.	10 pcs.	5 pcs.

Table 2-1 Test Result

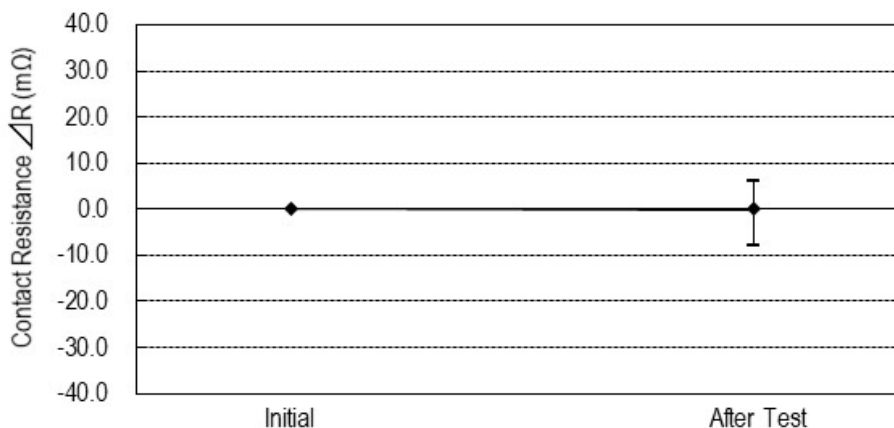
Test Item	Measurement		Spec.	Set	N	Data					Judge
						AVE.(X)	MAX.	MIN.	s	X±3s	
A Group Durability	Contact Resistance (mΩ)	Initial	40mΩ MAX.	5	275	18.579	24.79	13.34	2.284	25.431	○
		After 20th	ΔR=20mΩ MAX.			-0.019	6.01	-7.79	2.842	8.507	○
B Group FPC/FFC Retention Force (N)	20P	Initial	8N MIN. (0.4N/Pos.×20P)	5	5	53.400	55.51	49.78	2.429	46.113	○
	30P	Initial	12N MIN. (0.4N/Pos.×30P)	5	5	60.332	64.19	56.72	2.712	52.196	○
	40P	Initial	16N MIN. (0.4N/Pos.×40P)	5	5	65.312	69.55	63.13	2.678	57.278	○
	50P	Initial	20N MIN. (0.4N/Pos.×50P)	5	5	69.110	71.78	66.26	2.131	62.717	○
	55P	Initial	22N MIN. (0.4N/Pos.×55P)	5	5	71.734	76.30	68.30	4.122	59.368	○
	60P	Initial	24N MIN. (0.4N/Pos.×60P)	5	5	73.928	77.31	72.21	2.476	66.500	○
	64P	Initial	25.6N MIN. (0.4N/Pos.×64P)	5	5	76.238	79.97	73.21	2.797	67.847	○
	68P	Initial	27.2N MIN. (0.4N/Pos.×68P)	5	5	78.558	81.93	75.65	2.422	71.292	○
C Group Retention Force	CONTACT	Initial	0.2N MIN.	20	200	0.542	0.72	0.27	0.098	0.248	○
		After High Temp. Test				0.594	0.83	0.31	0.110	0.264	○
	HOLD DOWN	Initial	0.5N MIN.	20	40	2.767	3.01	2.51	0.144	2.335	○
		After High Temp. Test				3.040	3.39	2.69	0.180	2.500	○
D Group Vibration Shock	Contact Resistance (mΩ)	Initial	40mΩ MAX.	5	275	18.330	22.54	13.78	1.596	23.118	○
		After Vibration	ΔR=20mΩ MAX.			0.057	1.72	-1.72	0.601	1.860	○
		After Shock				-0.049	1.92	-2.04	0.719	2.108	○
	Discontinuity	During Vibration	1μsec. MAX.	5	5	No Discontinuity					○
		During Shock				No Discontinuity					○
	Appearance	After Vibration	No abnormality adversely affecting the performance shall occur.	5	5	No Abnormality					○
After Shock		No Abnormality					○				

Table 2-2 Test Result

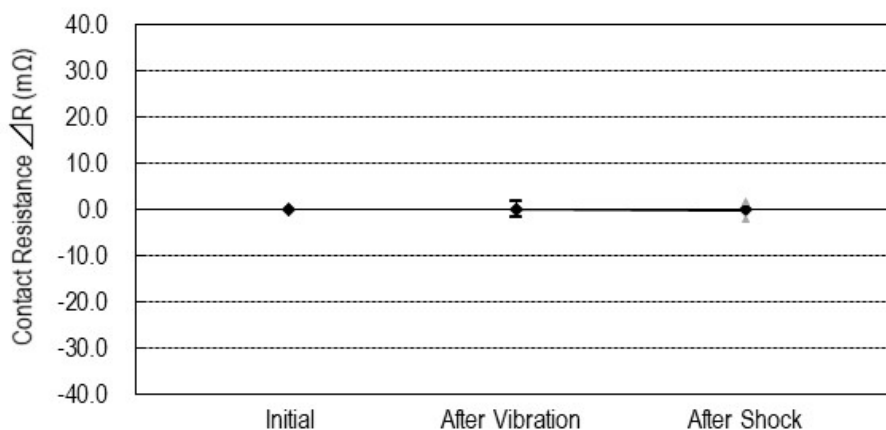
Test Item	Measurement		Spec.	Set	N	Data					Judge
						AVE.(X)	MAX.	MIN.	s	X±3s	
E Group Thermal Shock	Contact Resistance (mΩ)	Initial	40mΩ MAX.	5	275	17.908	22.79	11.33	1.993	23.887	○
		After Test	ΔR=20mΩ MAX.			-1.838	3.78	-7.97	2.157	4.633	○
	D.W.Voltage	Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur.	5	135	No Abnormality					○
		After Test				No Abnormality					○
	Insulation Resistance (MΩ)	Initial	500MΩ MIN	5	135	MIN. 4.0×10 ⁵ MΩ					○
		After Test				MIN. 3.0×10 ³ MΩ					○
	Appearance	After Test	No abnormality adversely affecting the performance shall occur.	5	10	No Abnormality					○
	F Group High Temp. Life	Contact Resistance (mΩ)	Initial	40mΩ MAX.	5	275	18.836	26.09	13.05	2.320	25.796
After Test			ΔR=20mΩ MAX.	-0.780			5.99	-9.11	2.682	7.266	○
Appearance		After Test	No abnormality adversely affecting the performance shall occur.	5	5	No Abnormality					○
G Group Humidity (Steady State)	Contact Resistance (mΩ)	Initial	40mΩ MAX.	5	275	18.298	25.83	12.02	2.906	27.016	○
		After Test	ΔR=20mΩ MAX.			-1.005	7.60	-8.85	2.904	7.707	○
	D.W.Voltage	Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur.	5	135	No Abnormality					○
		After Test				No Abnormality					○
	Insulation Resistance (MΩ)	Initial	500MΩ MIN	5	135	MIN. 5.0×10 ⁵ MΩ					○
		After Test				MIN. 2.5×10 ³ MΩ					○
	Appearance	After Test	No abnormality adversely affecting the performance shall occur.	5	10	No Abnormality					○
	H Group Humidity (Cycling)	Contact Resistance (mΩ)	Initial	40mΩ MAX.	5	100	18.100	25.43	12.16	2.552	25.756
After Test			ΔR=20mΩ MAX.	2.367			9.78	-4.86	2.717	10.518	○
D.W.Voltage		Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur.	5	135	No Abnormality					○
		After Test				No Abnormality					○
Insulation Resistance (MΩ)		Initial	500MΩ MIN	5	135	MIN. 1.0×10 ⁵ MΩ					○
		After Test				MIN. 1.5×10 ³ MΩ					○
Appearance		After Test	No abnormality adversely affecting the performance shall occur.	5	5	No Abnormality					○

Table 2-3 Test Result

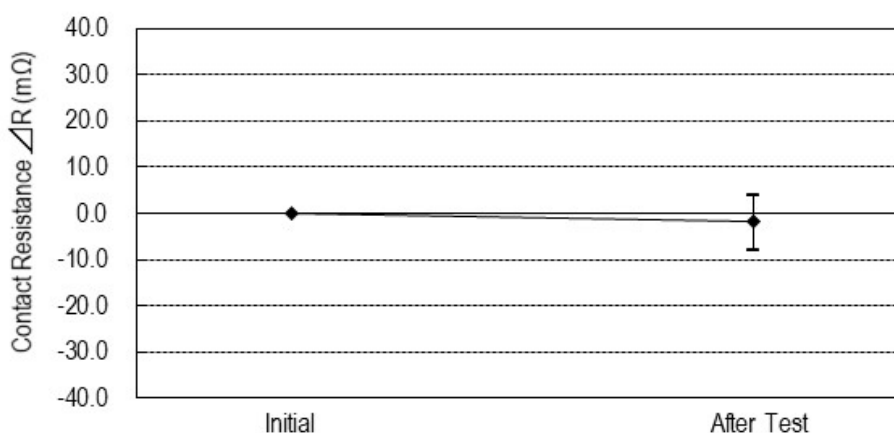
Test Item	Measurement		Spec.	Set	N	Data					Judge
						AVE.(X)	MAX.	MIN.	s	X±3s	
I Group Cold Temp. Life	Contact Resistance (mΩ)	Initial	40mΩ MAX.	5	275	16.043	19.56	11.67	1.652	20.999	○
		After Test	ΔR=20mΩ MAX.			-0.932	3.78	-5.73	1.603	3.877	○
	Appearance	After Test	No abnormality adversely affecting the performance shall occur.	5	5	No Abnormality					○
J Group Salt Water Spray	Contact Resistance (mΩ)	Initial	40mΩ MAX.	5	275	17.043	21.20	13.28	1.458	21.417	○
		After Test	ΔR=20mΩ MAX.			-0.401	3.99	-3.91	1.483	4.048	○
	Appearance	After Test	No abnormality adversely affecting the performance shall occur.	5	5	No Abnormality					○
K Group Gas (SO ₂)	Contact Resistance (mΩ)	Initial	40mΩ MAX.	5	275	17.361	21.30	12.64	1.706	22.479	○
		After Test	ΔR=20mΩ MAX.			-0.244	4.37	-3.89	1.556	4.424	○
	Appearance	After Test	No abnormality adversely affecting the performance shall occur.	5	5	No Abnormality					○
L Group Gas (H ₂ S)	Contact Resistance (mΩ)	Initial	40mΩ MAX.	5	275	19.763	24.63	14.87	1.945	25.598	○
		After Test	ΔR=20mΩ MAX.			-1.566	4.13	-6.46	1.974	4.356	○
	Appearance	After Test	No abnormality adversely affecting the performance shall occur.	5	5	No Abnormality					○
M Group Solderability	Appearance	CONTACT	Wetness 95% MIN.	5	5	95%MIN.was wet.					○
		HOLD DOWN		5	5	95%MIN.was wet.					
N Group Soldering Heat Resistance	Reflow twice		No abnormality adversely affecting the performance shall occur.	10	10	No Abnormality					○
O Group Temp. rising	0.35A/per contact		ΔT=30K MAX.	10	10	MAX. 18.7K. no problem.					○



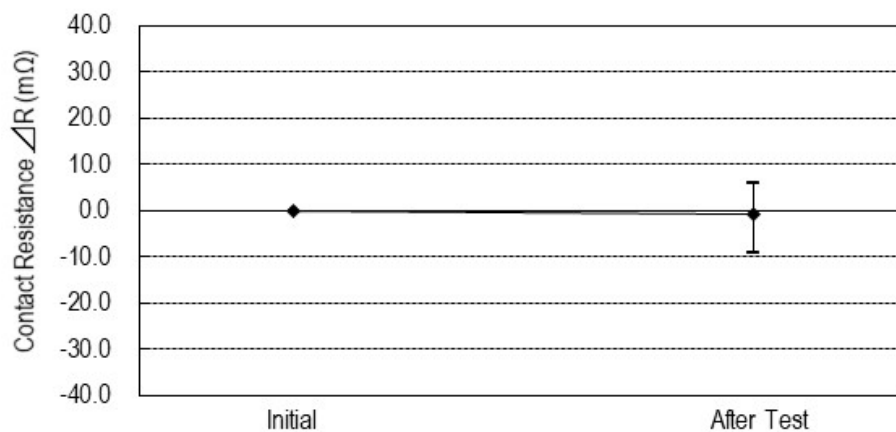
Graph.1 A change of Contact Resistance
A group : Durability



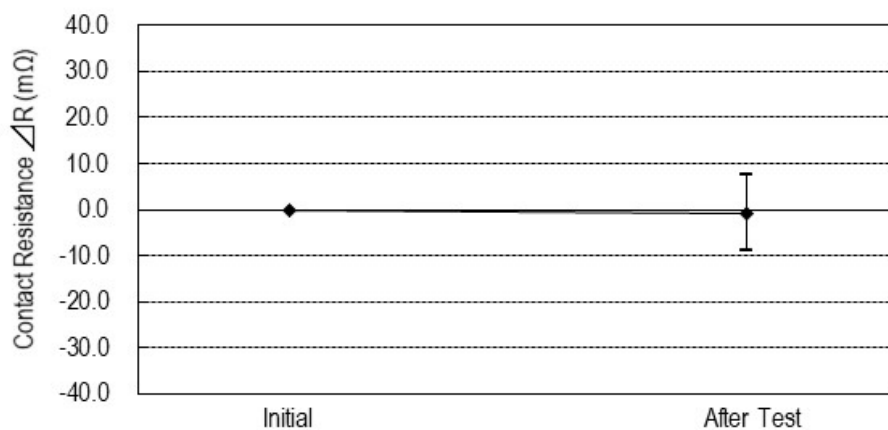
Graph.2 A change of Contact Resistance
D group : Vibration / Shock



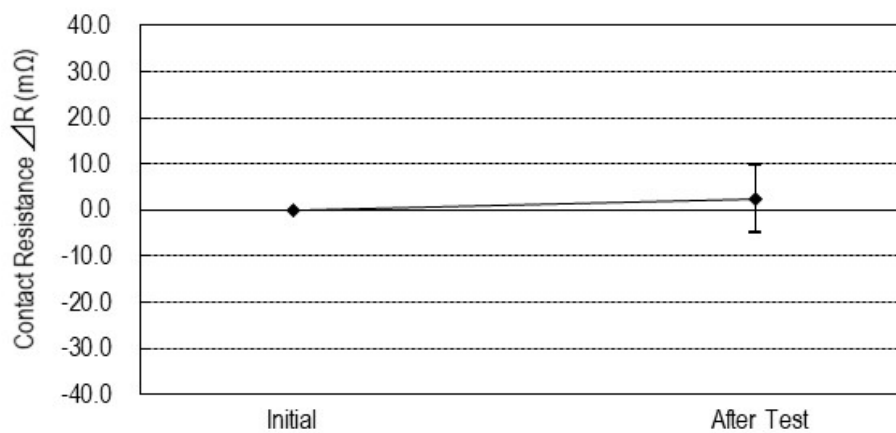
Graph.3 A change of Contact Resistance
E group : Thermal Shock



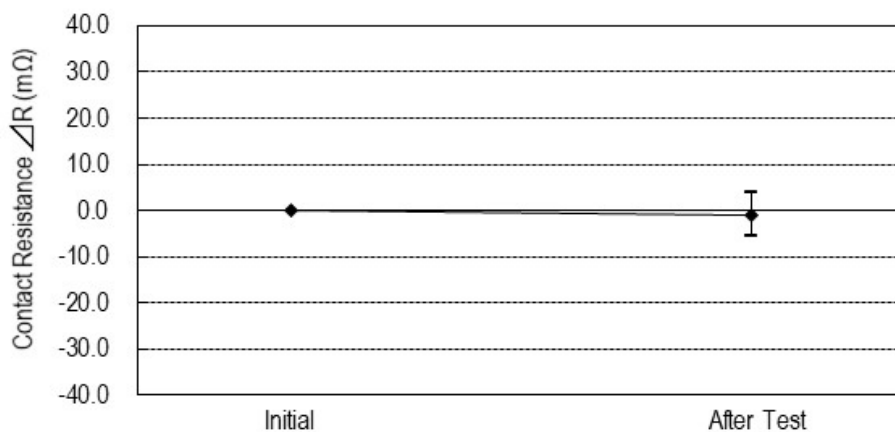
Graph.4 A change of Contact Resistance
F group : High Temp. Life



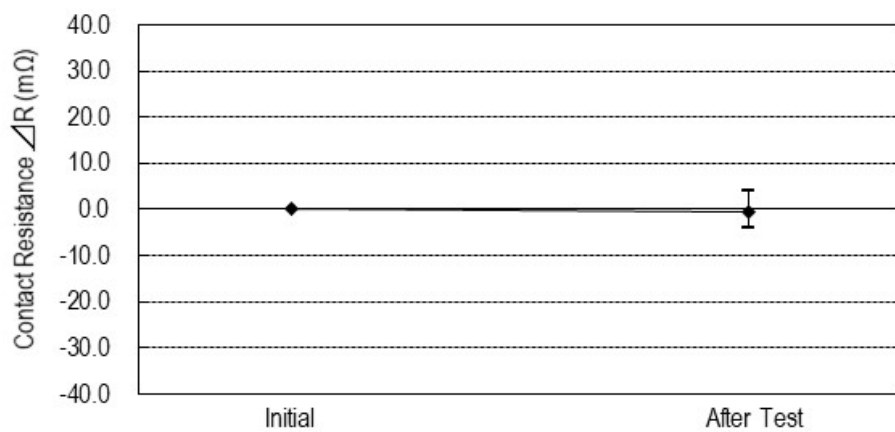
Graph.5 A change of Contact Resistance
G group : Humidity (Steady State)



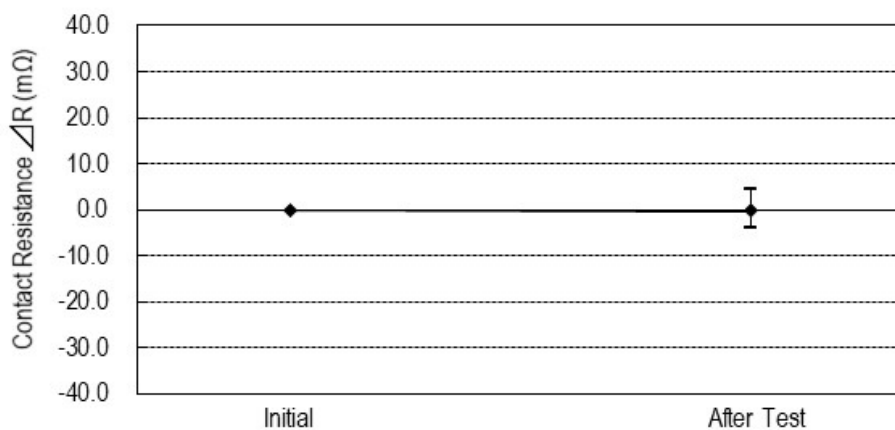
Graph.6 A change of Contact Resistance
H group : Humidity (Cycling)



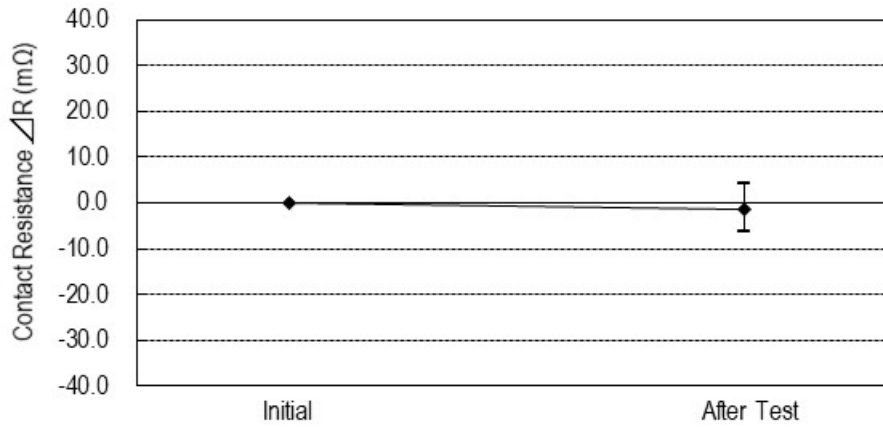
Graph.7 A change of Contact Resistance
I group : Cold Temp. Life



Graph.8 A change of Contact Resistance
J group : Salt Water Spray



Graph.9 A change of Contact Resistance
K group : Gas (SO₂)



Graph. 10 A change of Contact Resistance
L group : Gas (H_2S)