

MINIFLEX® 175-ST Connector

Part No. 20622-0**E-0*

Test Report

Product Specification no. PRS-2024

0	T20051	September 28, 2020	M.Muro	-	Y.Shimada
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of MINIFLEX 175-ST Connector in accordance with PRS-2024.

2. Specimen

(1) Connector : MINIFLEX 175-ST (Part No. 20622-0**E-0#)

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

Thickness Lead : $t=0.12\pm 0.03$ (Actual measurement : 0.116~0.118mm)

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 14. For the details of the testing conditions and requirements, see PRS-2024.

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

5. Conclusion

All the specimens met the requirements of PRS-2024.

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	R
Contact Resistance	2,7			1,3,5	1,3	1,3	1,3	1,5	1,5	1,3	1,3	1,3	1,3			
D. W. Voltage								2,6	2,6							
Insulation Resistance								3,7	3,7							
Temperature rising																1
Actuator Locking Force	1,5															
Actuator Un-locking Force	3,6															
FPC Retention Force		1,3														
Durability	4	2														
Contact Retention Force			1													
LOCK Retention Force			2													
Vibration				2												
Shock				4												
Fretting corrosion					2											
Thermal Shock						2										
High Temperature Life							2									
High Temperature & High Humidity energizing								4								
High Temperature & High Humidity Life									4							
Cold Temperature Life										2						
H2S Gas											2					
SO2 Gas												2				
Salt Water Spray													2			
Solderability														1		
Soldering Heat Resistance															1	
Specimen Quantity.	5 pcs.	5 pcs.	5 pos.	5 pos.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.

※Numbers indicate test sequences

Table 2-1 Test result

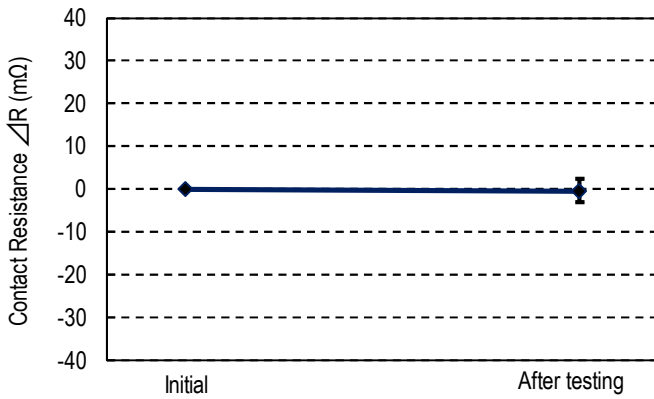
Test Item	Measurements		Spec.	Set	n	Data					Judge		
						AVG.(X)	MAX.	MIN.	s	X±3s			
A Group Durability	Contact resistance (mΩ)	Initial	80mΩ MAX.	5	95	54.428	60.71	47.63	5.290	70.298	OK		
		After 20th	ΔR=40mΩ MAX.			-0.473	2.45	-3.03	1.230	3.217	OK		
	Act Locking Force (N)	16P	Initial	5.4N MAX. (0.3N/Pos. ×(16P+2))	5	5	1.474	1.53	1.40	0.057	1.645	OK	
			20th cycles				1.408	1.45	1.36	0.041	1.531	OK	
		19P	Initial	6.3N MAX. (0.3N/Pos. ×(19P+2))	5	5	1.718	1.79	1.65	0.058	1.892	OK	
			20th cycles				1.634	1.76	1.59	0.072	1.850	OK	
	Act Un-locking Force (N)	16P	Initial	0.18N MIN. (0.01N/Pos. ×(16P+2))	5	5	0.744	0.78	0.71	0.029	0.657	OK	
			20th cycles				0.704	0.74	0.67	0.030	0.614	OK	
		19P	Initial	0.21N MIN. (0.01N/Pos. ×(19P+2))	5	5	0.870	0.91	0.82	0.034	0.768	OK	
			20th cycles				0.832	0.85	0.78	0.029	0.745	OK	
	B Group FPC retention force	FPC retention force (N)	16P	Initial	3.22N MIN. (0.06N/Pos. ×16P+2.26N)	5	5	7.448	7.65	7.29	0.149	7.001	OK
				After 20th				6.712	6.85	6.40	0.190	6.142	OK
19P			Initial	3.40N MIN. (0.06N/Pos. ×19P+2.26N)	5	5	8.576	8.94	8.21	0.294	7.694	OK	
			After 20th				8.062	8.35	7.63	0.297	7.171	OK	
C Group Retention force	Contact retention force (N)		0.25N MIN.	5	30	0.529	0.61	0.41	0.056	0.361	OK		
	LOCK retention force (N)		0.25N MIN.	5	10	0.441	0.46	0.42	0.013	0.402	OK		
D Group Vibration ↓ Shock	Contact resistance (mΩ)	Initial	80mΩ MAX.	5	95	54.469	60.63	46.90	5.324	70.441	OK		
		After vibration	ΔR=40mΩ MAX.			-0.507	2.88	-3.28	1.350	3.543	OK		
		After shock				-0.326	2.49	-2.90	1.184	3.226	OK		
	Discontinuity	During vibration	1μ sec. MAX.	5	5	No discontinuity					OK		
		During shock				No discontinuity					OK		
	Appearance	After vibration	No abnormality	5	5	No abnormality					OK		
After shock		No abnormality					OK						
E Group Fretting Corrosion	Contact resistance (mΩ)	Initial	80mΩ MAX.	5	95	54.223	61.80	46.24	5.372	70.339	OK		
		After testing	ΔR=40mΩ MAX.			-1.663	1.50	-5.65	1.682	3.383	OK		
	Discontinuity	During test	1μ sec. MAX.	5	5	No discontinuity					OK		
	Appearance	After testing	No abnormality	5	5	No abnormality					OK		

Table 2-2 Test result

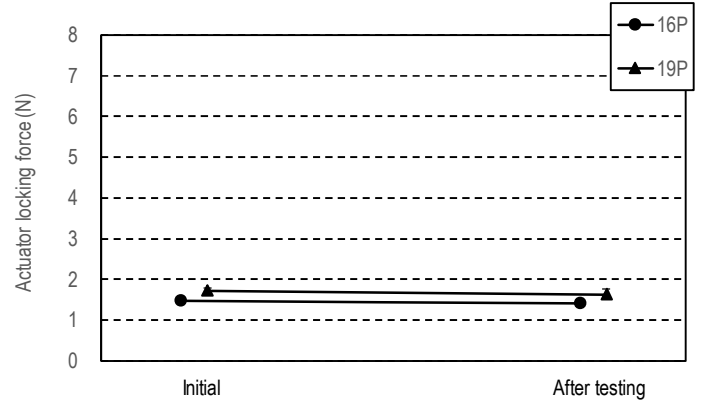
Test Item	Measurements		Spec.	Set	n	Data					Judge
						AVG.(X)	MAX.	MIN.	s	X±3s	
F Group Thermal shock	Contact resistance (mΩ)	Initial	80mΩ MAX.	5	95	54.467	61.13	47.33	5.322	70.433	OK
		After testing	ΔR=40mΩ MAX.			-0.451	2.76	-3.40	1.296	3.437	OK
	Appearance	After testing	No abnormality	5	5	No abnormality					OK
G Group High temp. life	Contact resistance (mΩ)	Initial	80mΩ MAX.	5	95	54.437	60.92	47.10	5.365	70.532	OK
		After testing	ΔR=40mΩ MAX.			-0.496	3.59	-3.49	1.375	3.629	OK
	Appearance	After testing	No abnormality	5	5	No abnormality					OK
H Group High temp. & High hum. energizing	Contact resistance (mΩ)	Initial	80mΩ MAX.	5	95	54.396	61.12	47.68	5.314	70.338	OK
		After testing	ΔR=40mΩ MAX.			-0.469	2.90	-4.07	1.424	3.803	OK
	D.W.Voltage	Initial	No abnormality	5	5	No abnormality					OK
		After testing				No abnormality					OK
	Insulation resistance (MΩ)	Initial	100MΩ MIN.	5	5	MIN. 1.0×10 ⁵ MΩ					OK
		After testing				MIN. 1.0×10 ³ MΩ					OK
Appearance	After testing	No abnormality	5	5	No abnormality					OK	
J Group High temp. & High hum. life	Contact resistance (mΩ)	Initial	80mΩ MAX.	5	95	54.331	60.85	47.48	5.356	70.399	OK
		After testing	ΔR=40mΩ MAX.			-0.348	2.51	-3.65	1.368	3.756	OK
	D.W.Voltage	Initial	No abnormality	5	5	No abnormality					OK
		After testing				No abnormality					OK
	Insulation resistance (MΩ)	Initial	100MΩ MIN.	5	5	MIN. 1.0×10 ⁵ MΩ					OK
		After testing				MIN. 1.0×10 ³ MΩ					OK
Appearance	After testing	No abnormality	5	5	No abnormality					OK	
K Group Cold temp. life	Contact resistance (mΩ)	Initial	80mΩ MAX.	5	95	54.377	60.65	47.18	5.298	70.271	OK
		After testing	ΔR=40mΩ MAX.			-0.431	3.01	-4.06	1.404	3.781	OK
	Appearance	After testing	No abnormality	5	5	No abnormality					OK

Table 2-3 Test result

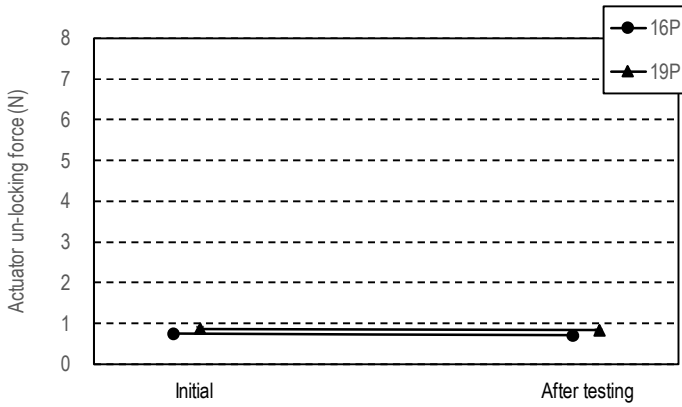
Test Item	Measurements		Spec.	Set	n	Data					Judge
						AVG.(X)	MAX.	MIN.	s	X±3s	
L Group H ₂ S gas	Contact resistance (mΩ)	Initial	80mΩ MAX.	5	95	54.293	62.15	45.06	5.334	70.295	OK
		After testing	ΔR=40mΩ MAX.			-0.726	1.72	-3.45	1.237	2.985	OK
	Appearance	After testing	No abnormality	5	5	No abnormality					OK
M Group SO ₂ gas	Contact resistance (mΩ)	Initial	80mΩ MAX.	5	95	54.569	62.09	46.57	5.362	70.655	OK
		After testing	ΔR=40mΩ MAX.			-0.369	2.11	-2.41	1.149	3.078	OK
	Appearance	After testing	No abnormality	5	5	No abnormality					OK
N Group Salt water spray	Contact resistance (mΩ)	Initial	80mΩ MAX.	5	95	54.272	62.04	45.94	5.540	70.892	OK
		After testing	ΔR=40mΩ MAX.			-1.239	2.85	-6.53	2.318	5.715	OK
	Appearance	After testing	No abnormality	5	5	No abnormality					OK
P Group Solderability	Zerox Time (sec.)	Contact	3 sec. MAX.	5	5	MAX. 0 sec.					OK
		LOCK		5	5	MAX. 0 sec.					OK
	Appearance	Contact	Wetness :95% MIN.	5	5	95%MIN.was wet.					OK
		LOCK		5	5	95%MIN.was wet.					OK
Q Group Soldering heat resistance	Reflow twice		No abnormality	5	5	No abnormality					OK
	Soldering iron			5	5	No abnormality					OK
R Group Temp. rising	19P	0.30A/Contact 4.0A/Connector	ΔT=30K(°C) MAX.	5	5	ΔT=17.2K(°C) MAX.					OK



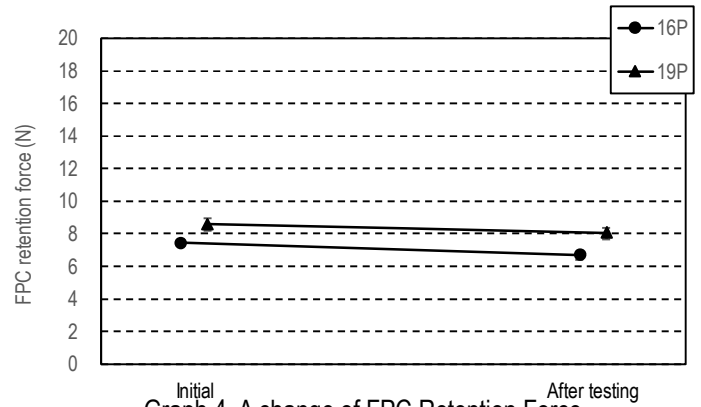
Graph 1. A change of Contact Resistance
A group : Durability



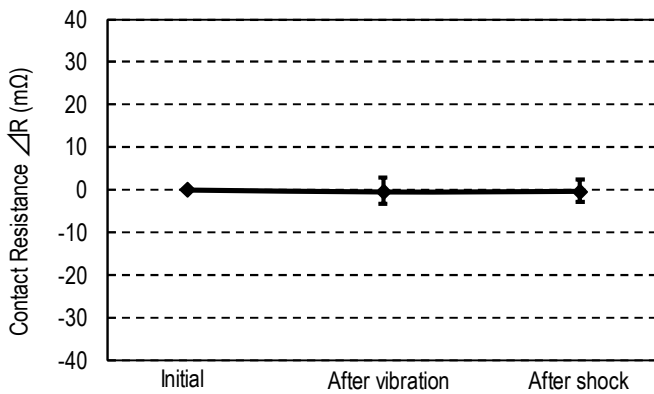
Graph 2. A change of Locking Force
A group : Durability



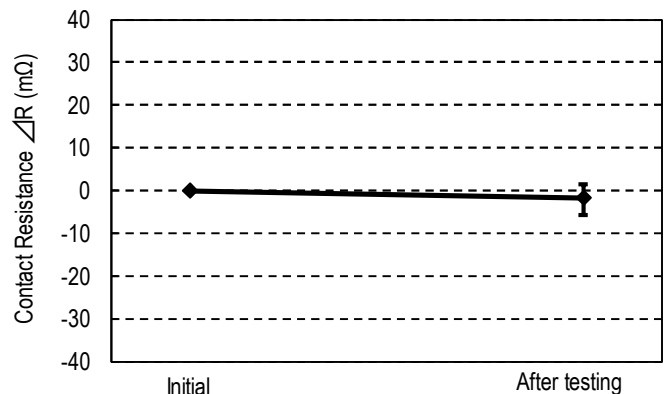
Graph 3. A change of Un-locking Force
A group : Durability



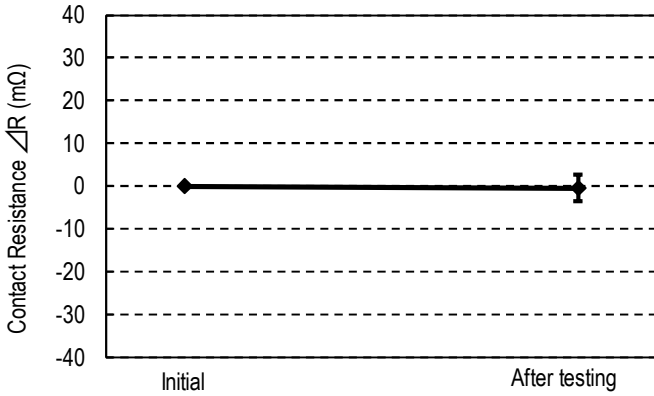
Graph 4. A change of FPC Retention Force
B group : FPC Retention Force



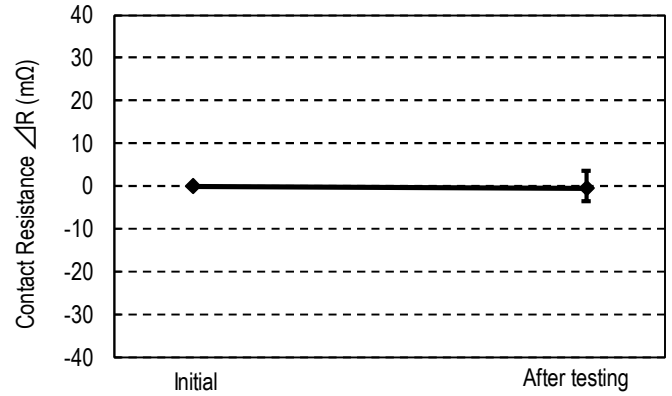
Graph 5. A change of Contact Resistance
D group : Vibration / Shock



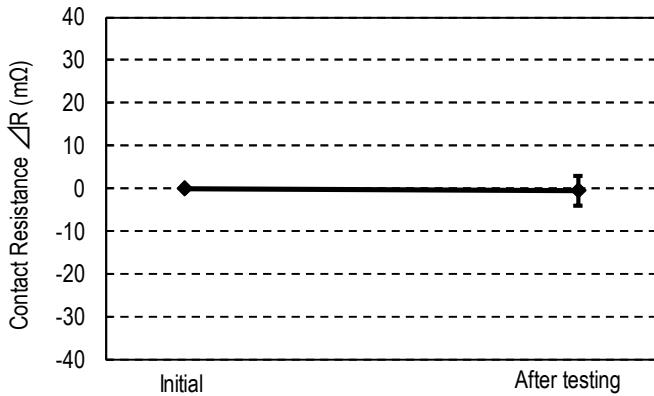
Graph 6. A change of Contact Resistance
E group : Fretting Corrosion



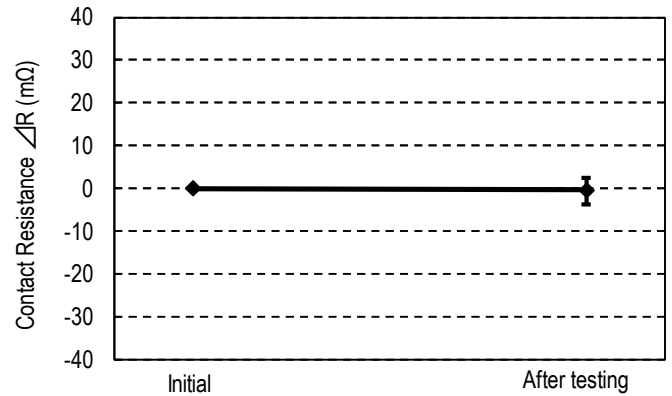
Graph 7. A change of Contact Resistance
F group : Thermal Shock



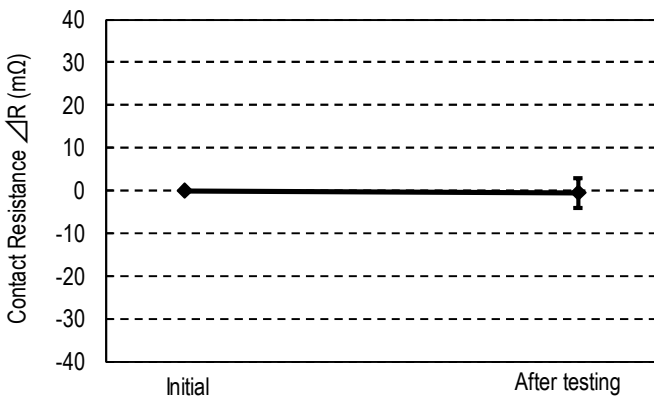
Graph 8. A change of Contact Resistance
G group : High Temp. Life



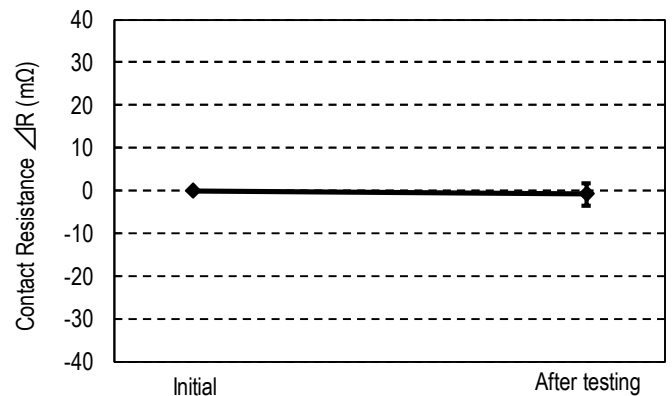
Graph 9. A change of Contact Resistance
H group : High Temp. & High Hum. Energizing



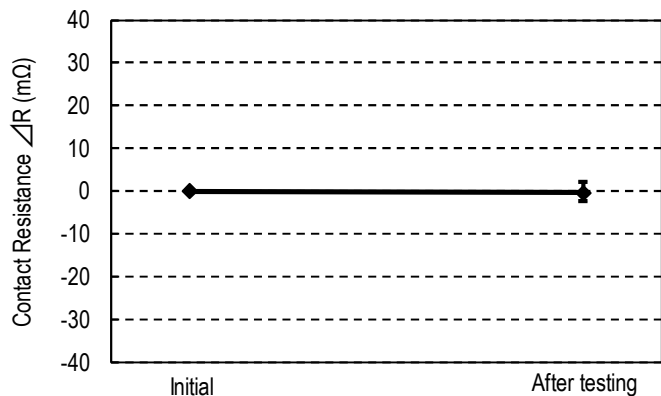
Graph 10. A change of Contact Resistance
J group : High Temp. & High Hum. Life



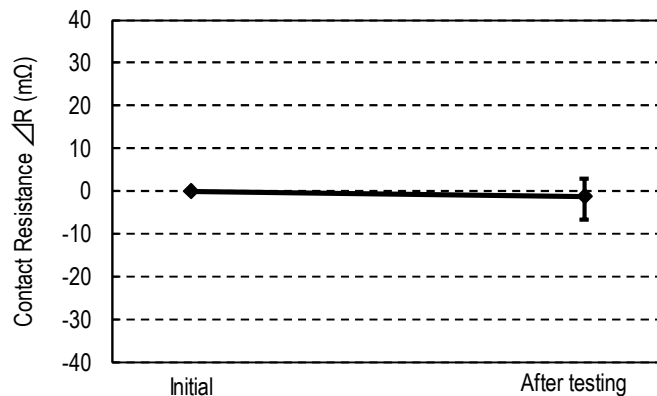
Graph 11. A change of Contact Resistance
K group : Cold Temp. Life



Graph 12. A change of Contact Resistance
L group : Gas(H₂S)



Graph 13. A change of Contact Resistance
M group : Gas(SO₂)



Graph 14. A change of Contact Resistance
N group : Salt Water Spray