

MP-A 04

Part No. 3224-000*

Test Report

Product Specification no. PRS-2235

2	T21137	November 30, 2021	H.Takao	K.Yufu	M.Takemoto
1	T18045	May 9, 2018	M.Nomoto	S.Kawamura	K.Yotsutani
0	T16186	December 23, 2016	S.Kamada	S.Taguchi	K.Yotsutani
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of MP-A 04 Connector in accordance with PRS-2235.

2. Specimen

MP-A 04 (Part No. 3224-000*)

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 1-1 to 1-11. For the details of the testing conditions and requirements, see PRS-2235.
The "n" in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-2235.

Table 1 Test Sequence and Sample Quantity

Test Item	Group									
	A	B	C	D	E	F	G	H	J	K
Contact resistance		1,3	1,3	1,3	1,3	1,3	1,3	1,3		2
Mating force	1,4									
Un-mating force	2,5									
Durability	3	2								
Vibration			2							
Shock				2						
Thermal shock					2					
High temperature life						2				
Humidity (Steady State)							2			
Low-temperature test								2		
Solder ability									1	
Soldering heat resistance										1
Specimen quantity.	10	10	5	5	5	5	5	5	5	5

※Numbers indicate test sequences

Table 2-1 Test Result

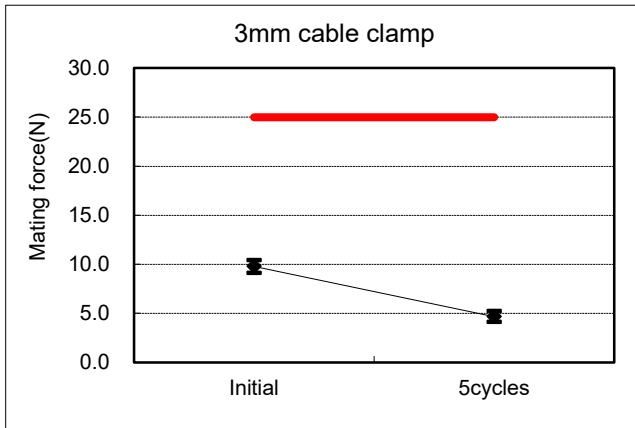
Test Item	Measurements	Spec.	n	Unit	Data				Judge.
					AVE.	MAX.	MIN.	σ	
A									
Mating Force									
Cable Clamp 3mm	Initial	25 MAX.	10	N	9.80	10.4	9.1	0.50	OK
	5cycles				4.68	5.3	4.1	0.47	OK
Cable Clamp 6mm	Initial		10.56	11.3	9.3	0.79	OK		
	5cycles		5.65	6.2	5.2	0.46	OK		
Un-mating Force									
Cable Clamp 3mm	Initial	3 MIN.	10	N	5.34	5.6	5.0	0.28	OK
	5cycles	2 MIN.			4.21	4.9	3.6	0.49	OK
Cable Clamp 6mm	Initial	3 MIN.	10	N	5.30	6.1	4.6	0.55	OK
	5cycles	2 MIN.			4.70	5.1	4.4	0.31	OK
B									
Durability									
Cable clamp 3mm									
Contact Resistance	Initial	70 MAX	10	m Ω	5.70	5.9	5.6	0.13	OK
	5cycles				6.97	7.2	6.8	0.17	OK
Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
	After test	—	10	-	No abnormality				OK
Cable clamp 6mm									
Contact Resistance	Initial	70 MAX	10	m Ω	5.87	6.1	5.7	0.16	OK
	5cycles				7.11	7.5	6.5	0.39	OK
Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
	After test	—	10	-	No abnormality				OK
C									
Vibration									
Cable clamp 3mm									
Contact Resistance	Initial	70 MAX	5	m Ω	5.01	5.1	4.9	0.09	OK
	After test				7.42	8.1	6.8	0.56	OK
Electrical discontinuity	Spec. No electrical discontinuity greater than 1 μ s shall occur.								
	During test	—	5	-	No discontinuity				OK
Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
	After test	—	5	-	No abnormality				OK
Cable clamp 6mm									
Contact Resistance	Initial	70 MAX	5	m Ω	6.01	6.2	5.8	0.14	OK
	After test				6.51	6.7	6.3	0.18	OK
Electrical discontinuity	Spec. No electrical discontinuity greater than 1 μ s shall occur.								
	During test	—	5	-	No discontinuity				OK
Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
	After test	—	5	-	No abnormality				OK

Table 2-2 Test Result

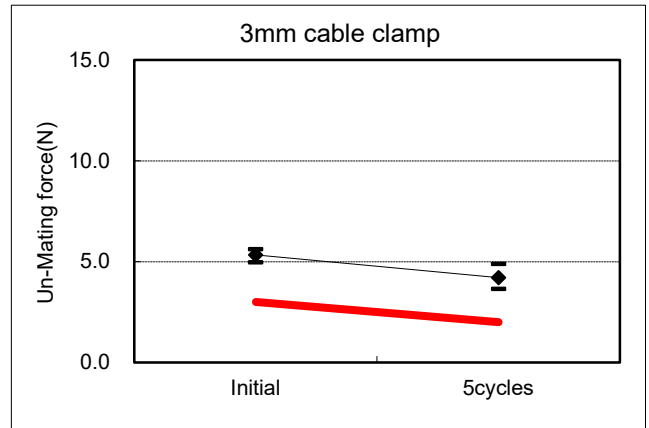
Test Item	Measurements	Spec.	n	Unit	Data				Judge.
					AVE.	MAX.	MIN.	σ	
Shock									
Cable clamp 3mm									
Contact Resistance	Initial	70 MAX	5	mΩ	6.50	6.6	6.2	0.17	OK
	After test				6.45	6.7	6.2	0.21	
Electrical discontinuity	Spec. No electrical discontinuity greater than 1μs shall occur.								
	During test	—	5	-	No discontinuity				OK
Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
	After test	—	5	-	No abnormality				OK
Cable clamp 6mm									
Contact Resistance	Initial	70 MAX	5	mΩ	5.74	5.9	5.4	0.23	OK
	After test				5.77	6.1	5.4	0.25	
Electrical discontinuity	Spec. No electrical discontinuity greater than 1μs shall occur.								
	During test	—	5	-	No discontinuity				OK
Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
	After test	—	5	-	No abnormality				OK
Thermal Shock									
Cable clamp 3mm									
Contact Resistance	Initial	70 MAX	5	mΩ	6.60	6.8	6.4	0.12	OK
	After test				6.54	7.1	6.0	0.48	
Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
	After test	—	5	-	No abnormality				OK
Cable clamp 6mm									
Contact Resistance	Initial	70 MAX	5	mΩ	6.00	6.1	5.9	0.06	OK
	After test				6.22	6.4	6.1	0.11	
Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
	After test	—	5	-	No abnormality				OK
High temperature life									
Cable clamp 3mm									
Contact Resistance	Initial	70 MAX	5	mΩ	5.62	5.9	5.3	0.24	OK
	After test				7.45	8.0	6.9	0.43	
Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
	After test	—	5	-	No abnormality				OK
Cable clamp 6mm									
Contact Resistance	Initial	70 MAX	5	mΩ	5.48	5.9	5.1	0.31	OK
	After test				5.99	6.3	5.8	0.17	
Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
	After test	—	5	-	No abnormality				OK

Table 2-3 Test Result

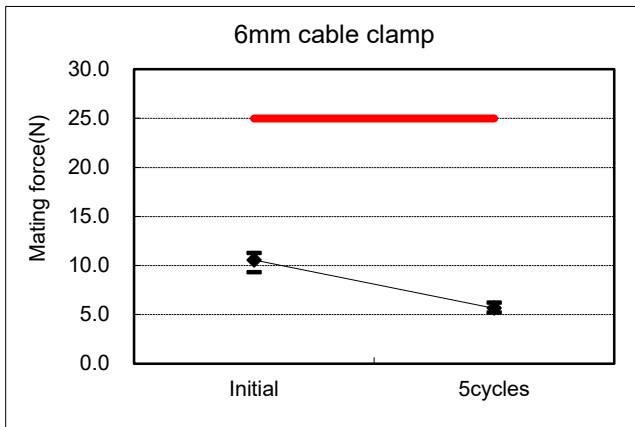
Test Item	Measurements	Spec.	n	Unit	Data				Judge.	
					AVE.	MAX.	MIN.	σ		
Humidity (Steady state)										
Cable clamp 3mm										
G	Contact Resistance	Initial	70 MAX	5	mΩ	5.20	5.4	4.9	0.19	OK
		After test				7.39	7.8	7.0	0.34	OK
G	Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
		After test	—	5	-	No abnormality				OK
Cable clamp 6mm										
G	Contact Resistance	Initial	70 MAX	5	mΩ	5.89	6.8	5.5	0.51	OK
		After test				5.93	6.3	5.5	0.33	OK
G	Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
		After test	—	5	-	No abnormality				OK
Low-temperature test										
Cable clamp 3mm										
H	Contact Resistance	Initial	70 MAX	5	mΩ	5.47	5.6	5.3	0.11	OK
		After test				7.09	7.2	7.0	0.07	OK
H	Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
		After test	—	5	-	No abnormality				OK
Cable clamp 6mm										
H	Contact Resistance	Initial	70 MAX	5	mΩ	5.93	6.1	5.6	0.22	OK
		After test				6.47	6.7	6.3	0.16	OK
H	Appearance	Spec. No abnormality adversely affecting the performance shall occur.								
		After test	—	5	-	No abnormality				OK
Surface Mount Solderability test										
J	Solder wetting area	After test	95 MIN	5	%	95 MIN.				OK
Resistance to Reflow Soldering Heat										
Cable clamp 3mm										
K	Contact Resistance	After test	70 MAX	5	mΩ	5.80	6.1	5.5	0.21	OK
		Spec. No abnormality adversely affecting the performance shall occur.								
K	Appearance	After test	—	5	-	No abnormality				OK
		Spec. No abnormality adversely affecting the performance shall occur.								
Cable clamp 6mm										
K	Contact Resistance	After test	70 MAX	5	mΩ	6.05	6.4	5.9	0.20	OK
		Spec. No abnormality adversely affecting the performance shall occur.								
K	Appearance	After test	—	5	-	No abnormality				OK
		Spec. No abnormality adversely affecting the performance shall occur.								



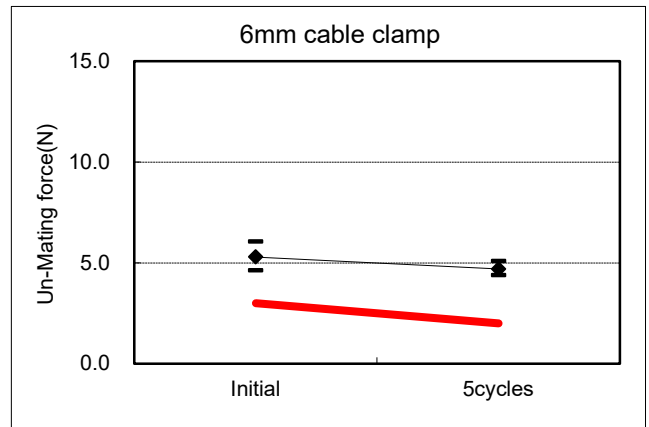
Graph1-1 Mating force(3mm cable clamp)



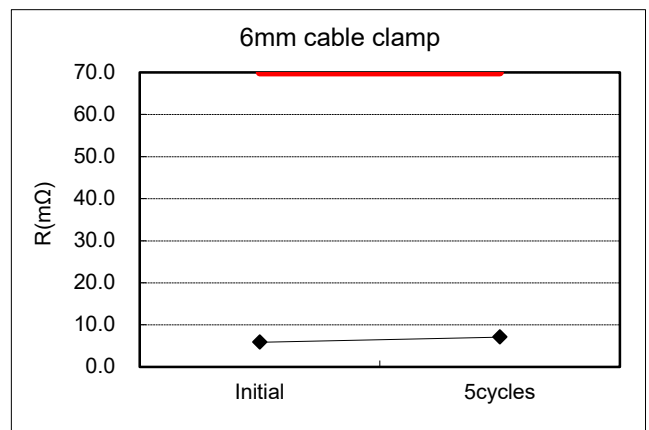
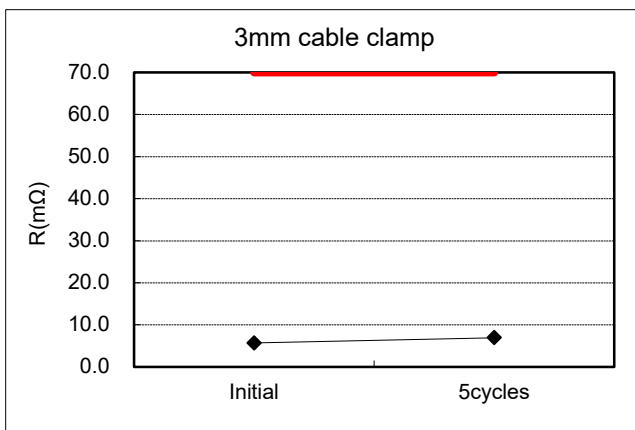
Graph1-2 Un-mating force(3mm cable clamp)



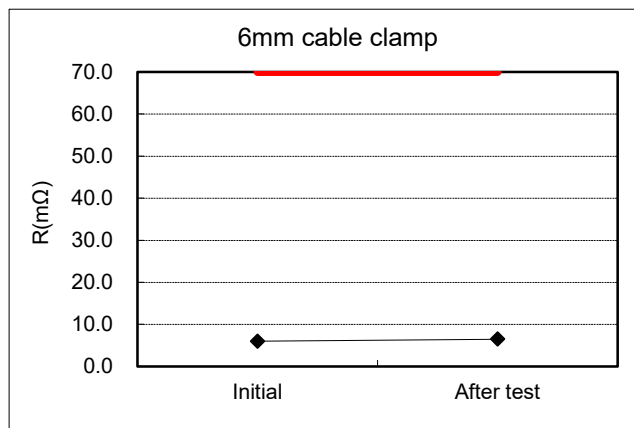
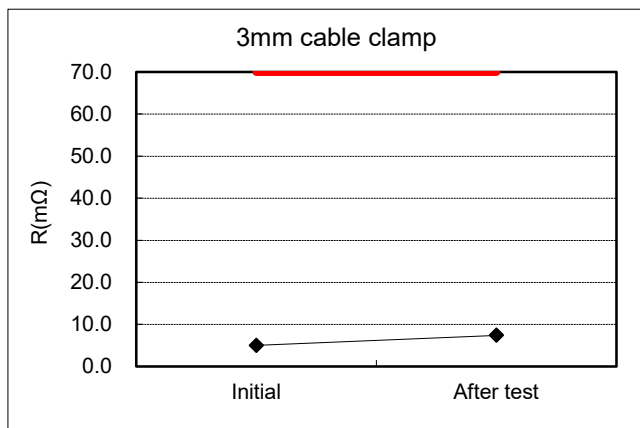
Graph1-3 Mating force (6mm cable clamp)



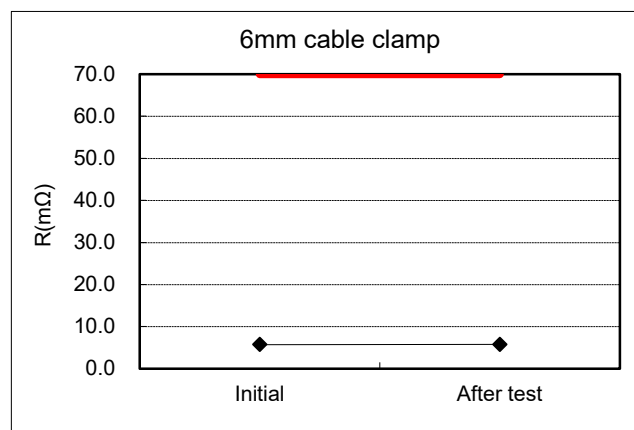
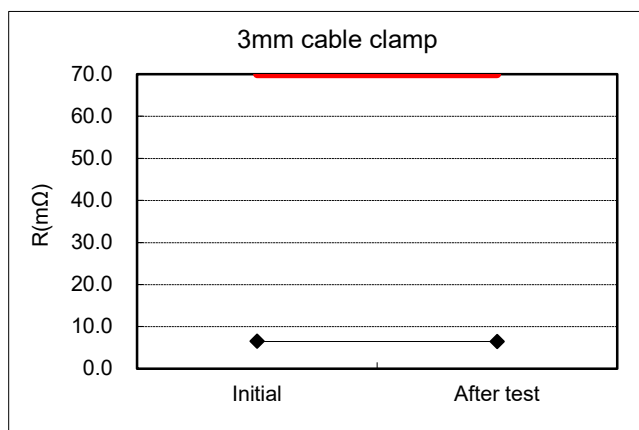
Graph1-4 Un-mating force (6mm cable clamp)



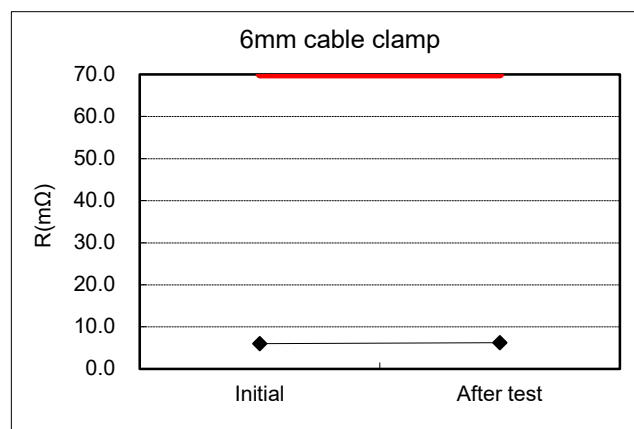
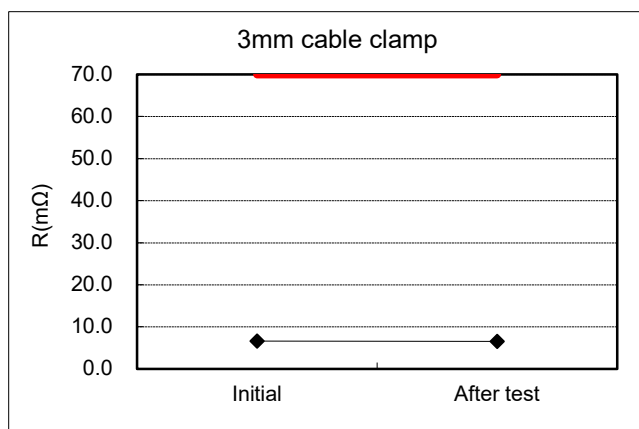
Graph1-5 Durability



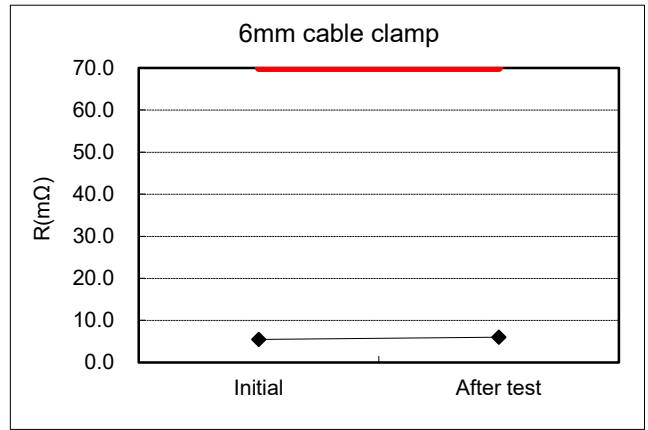
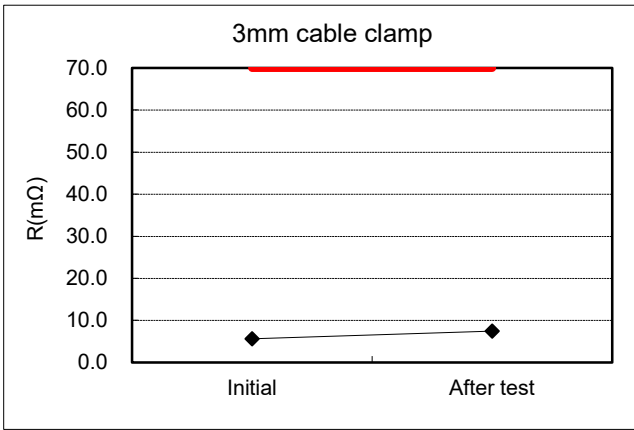
Graph1-6 Vibration



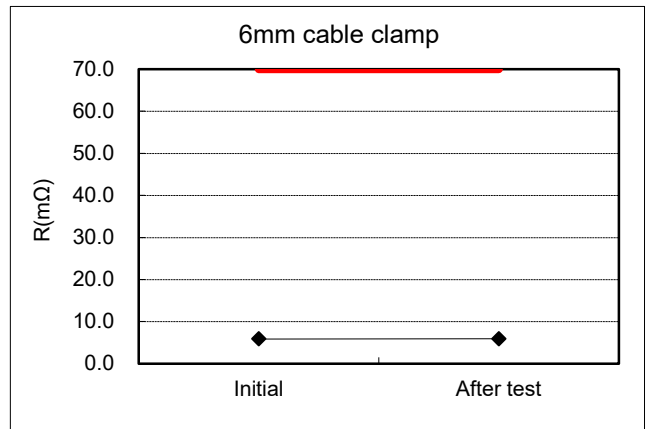
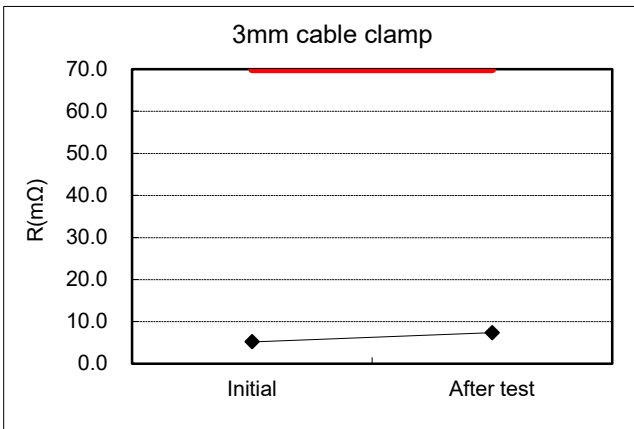
Graph1-7 Shock



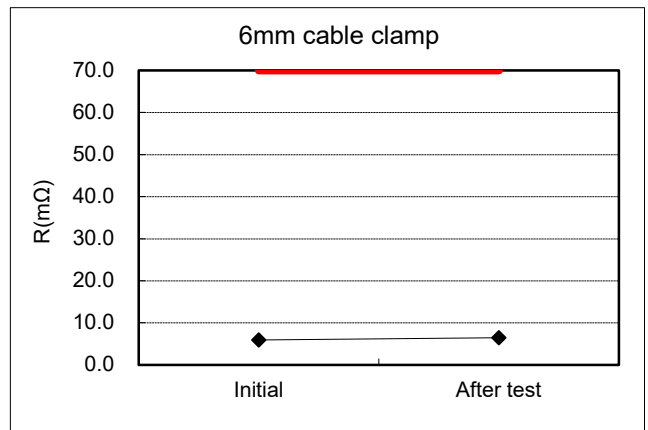
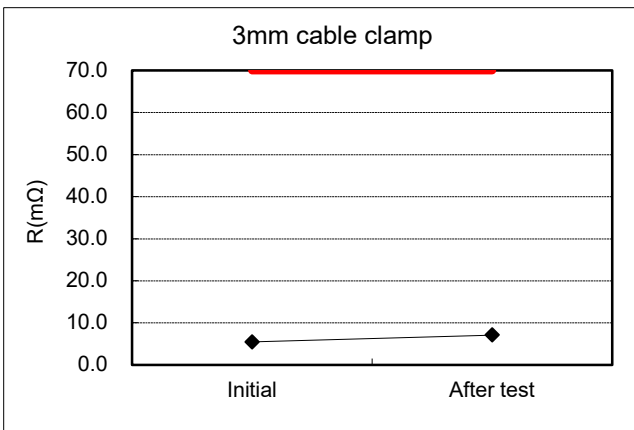
Graph1-8 Thermal Shock



Graph1-9 High temperature life



Graph1-10 Humidity (Steady state)



Graph1-11 Low-temperature test