



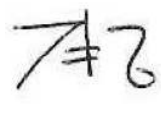


# Validation Test Report

Spring Finger 3.0H

March 14, 2014.



Tested & Reported By	Reviewed By	Approved By	Test Date	From February 24, 2014 To March 13, 2014
			Classification	Unrestricted

## ● TE CONNECTIVITY RELIABILITY TEST REPORT

Test Name : Validation for Spring Finger 3.0H
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### 1. Introduction

#### 1-1 Purpose

Testing was performed on the Spring Finger 3.0H to determine if it conformance to the requirements of Product Specification 108-61190, Rev.A1

#### 1-2 Scope

This report covers the electrical, mechanical, environmental performance requirements of the Spring Finger 3.0H

The testing was performed between February 24, 2014 and March 13, 2014.

#### 1-3 Test Samples

The test samples were randomly selected from normal current production lots.

P/N	Description
2108609-5	Spring Finger 3.0H

#### 1-4 Conclusion

The Spring Finger 3.0H meets the electrical, mechanical and environmental performance requirements of Product Specification 108-61190, Rev.A1

#### 1-5 Attachment

- 1) Test Sequence
- 2) Requirements and Test Procedure
- 3) Test Result
- 4) Photograph of Test

## 1) Test Sequence

Para.	Test Examination	Test Group				
		1	2	3	4	5
		Test Sequence (a)				
3.5.1	Examination of Product	1,10	1,3	1,7	1,7	1,5
-	Contact Height measurement	3,7		2,5	2,5	
3.5.2	Contact resistance	4,8		3,6	3,6	2,4
3.5.3	Normal force	5,9				
3.5.4	Durability	6				
3.5.5	Solderability		2			
3.5.6	Damp heat			4		
3.5.7	Thermal Shock				4	
3.5.8	Salt spray					3
3.5.9	Resistance to Soldering heat	2				

## 2) Requirements and Test Procedure

Para.	Test Items	Requirements	Procedures
3.5.1	Examination of Product	No physical damage	Visual inspection No physical damage
Electrical Requirements			
3.5.2	Contact Resistance (Low Level)	Initial, 50mΩ Max.	Mate pad with dry circuit(20mV Max., 10mA Max.) at 50% WP. (Spring height: 2.6mm) 4-wire measurement is required. Measuring condition shown as Fig.4
Mechanical Requirements			
3.5.3	Normal Force	40gf Min at 2.6mm spring Height	Stroke the spring top to 2.6mm product height. Measuring condition shown as Fig.5
3.5.4	Durability	Contact height should be under 20% from initial height after test No physical damage and shall meet requirements of subsequent tests.	Speed: 600cycle/hour, Total 10000cycle Stroke: 80% of Working position (Spring height 2.36mm)
3.5.5	Solderability	Solderable area shall have a minimum of 95% solder coverage. For lead free solder pot temperature shall be 240°C±5°C	Peak Temperature : 240°C±5°C, Reflow Time(230°C Min) : 45~60 seconds.
Environmental Requirements			
3.5.6	Damp heat	Contact height should be under 20% from initial height after test No physical damage and shall meet requirement of subsequent test.	120 hours at Temp. 85°C±2°C, R/H 85± 5% It should be tested at 100% WP (Spring height 2.2mm)
3.5.7	Thermal Shock	Contact height should be under 20% from initial height after test No physical damage and shall meet requirement of subsequent test.	Ta= - 40°C for 2hour ;Tb= +85°C for 2hour Total 15cycles. It should be tested at 100% WP (Spring height: 2.2mm)
3.5.8	Salt spray	No physical damage and shall meet requirement of subsequent test.	48 hours spray, At temp. 35±2 °C R/H 90~95%, Salt NaCl mist 5% After test wash parts and return to room ambient for 2 hours.

3.5.9	Resistance to Soldering heat	No physical damage and shall meet requirement of subsequent test.	Reflow condition shown as Fig.3 Peak Temperature: 245°C
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Fig 1. (END)

The meaning of text "Physical damage" in the table above is :

- No dimension change
- No pinhole corrosion of plating
- No general corrosion of plating
- No adhesion problem of plating
- No blistering of plating
- No flaking of plating
- No loosen parts
- No cracks on any parts

3) Test Result  
- Test Group 1

NO	Test Items	Test Condition	Acceptance criteria	Unit	Test Result								Judgment
					S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	No physical damage.	-	OK	OK	OK	OK	OK	-	-	-	OK
		After Resistance to Soldering Heat			OK	OK	OK	OK	OK	-	-	-	OK
		After Durability			OK	OK	OK	OK	OK	-	-	-	OK
		Final			OK	OK	OK	OK	OK	-	-	-	OK
2	Contact Height	Initial	-	mm	3.055	3.054	0.354	3.062	3.040	0.354	3.062	2.513	-
		Final	Displacement rate of contact height should be under 20% from initial height.		3.049	3.041	3.039	3.045	3.031	3.031	3.049	3.041	-
				%	0.2%	0.4%	-758.5%	0.6%	0.3%	-	-	-	OK
3	Contact Resistance	Initial	50mΩ Max.	mΩ	16.1	15.3	16.5	15.9	16.1	15.3	16.5	16.0	OK
		Final			19.2	18.9	20.3	21.1	19.9	18.9	21.1	19.9	OK
4	Normal Force	Initial	40gf Min.	gf	60	72	68	61	62	60.0	72.0	64.6	OK
		Final			59	70	66	60	60	59.0	70.0	63.0	OK

## - Test Group 2

NO	Test Items	Test Condition	Acceptance criteria	Unit	Test Result								Judgment
					S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	No physical damage.	-	OK	OK	OK	OK	OK	-	-	-	OK
		Final			OK	OK	OK	OK	OK	-	-	-	OK
2	Solderability	Initial	Solderable area shall have a minimum of 95% solder coverage.	-	OK	OK	OK	OK	OK	-	-	-	OK

## - Test Group 3

NO	Test Items	Test Condition	Acceptance criteria	Unit	Test Result								Judgment
					S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	No physical damage.	-	OK	OK	OK	OK	OK	-	-	-	OK
		After Damp Heat			OK	OK	OK	OK	OK	-	-	-	OK
		Final			OK	OK	OK	OK	OK	-	-	-	OK
2	Contact Height	Initial	-	mm	3.061	3.055	3.049	3.063	3.054	3.049	3.063	3.056	-
		Final	Displacement rate of contact height should be under 20% from initial height.		2.965	2.946	2.946	2.971	2.984	2.946	2.984	2.962	-
				%	3.1%	3.6%	3.4%	3.0%	2.3%	-	-	-	OK
3	Contact Resistance	Initial	50mΩ Max.	mΩ	15.9	16.3	16.7	16.5	16.8	15.9	16.8	16.4	OK
		Final			19.8	20.1	21.4	20.8	22.1	19.8	22.1	20.8	OK

- Test Group 4

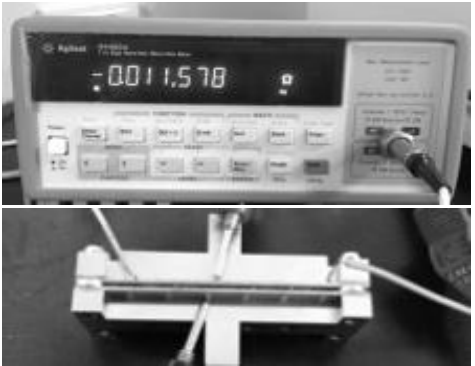


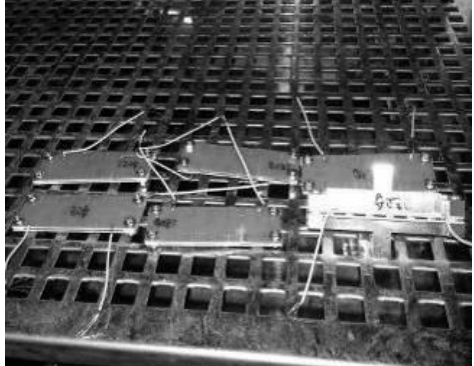
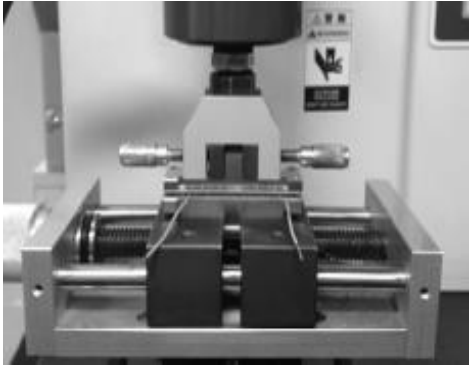
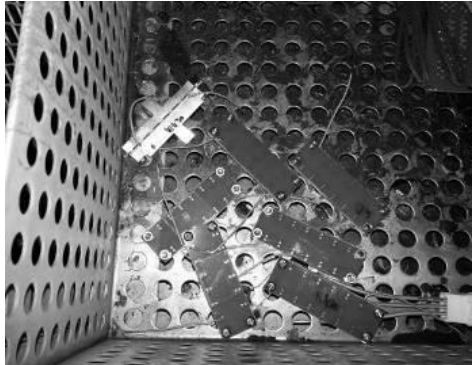
NO	Test Items	Test Condition	Acceptance criteria	Unit	Test Result								Judgment
					S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	No physical damage.	-	OK	OK	OK	OK	OK	-	-	-	OK
		After Thermal Shock			OK	OK	OK	OK	OK	-	-	-	OK
		Final			OK	OK	OK	OK	OK	-	-	-	OK
2	Contact Height	Initial	-	mm	3.049	3.055	3.052	3.048	3.057	3.048	3.057	3.052	-
		Final	Displacement rate of contact height should be under 20% from initial height.		2.991	2.981	3.014	3.015	2.977	2.977	3.015	2.996	-
				%	1.9%	2.4%	1.2%	1.1%	2.6%	-	-	-	OK
3	Contact Resistance	Initial	50mΩ Max.	mΩ	16.2	16.3	15.9	16.4	16.1	15.9	16.4	16.2	OK
		Final			16.4	16.8	16.5	16.9	16.2	16.2	16.9	16.6	OK

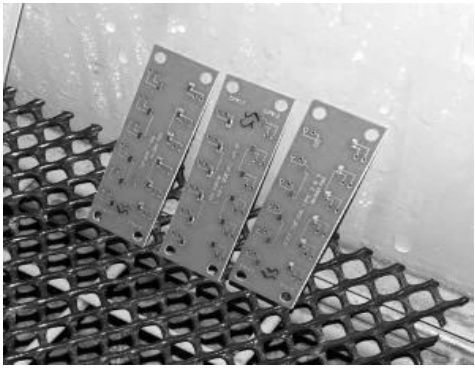
- Test Group 5

NO	Test Items	Test Condition	Acceptance criteria	Unit	Test Result								Judgment
					S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	No physical damage.	-	OK	OK	OK	OK	OK	-	-	-	OK
		After Salt Spray			OK	OK	OK	OK	OK	-	-	-	OK
		Final			OK	OK	OK	OK	OK	-	-	-	OK
2	Contact Resistance	Initial	50mΩ Max.	mΩ	16.5	16.8	15.7	16.2	16.1	15.7	16.8	16.3	OK
		Final			25.9	23.4	18.9	25.0	23.6	18.9	25.9	23.4	OK



4) Photograph of Test

NO.	Test Items	Photograph	Remark	NO.	Test Items	Photograph	Remark
1	Contact Resistance		-	4	Solderability		-
2	Normal Force		-	5	Damp Heat		-
3	Durability		-	6	Thermal Shock		-

NO.	Test Items	Photograph	Remark
7	Salt Spray		-
8	-	-	-
9	-	-	-

NO.	Test Items	Photograph	Remark
10	-	-	-
11	-	-	-
12	-	-	-