

1.45H Spring Finger

1. Introduction

1.1 Objective

Testing was performed on the 1.45H Spring Finger to determine if it meets the requirements of Product Specification 108-115146.

1.2 Scope

This report covers the Electrical, Mechanical and environmental performance requirements of 1.45H Spring Finger.

The qualification testing was performed between 13-JUL-2018 and 24-JUL-2016.

1.3 Conclusion

1.1H Lower Profile Spring Finger meets the Electrical, Mechanical and Environmental performance requirements of Product Specification, 108-115146.

1.4 Product Description

Product Part No.	Products name	Height (mm)
2336713-*	1.45H Spring Finger	1.45

Fig.1

2. Test Contents

Para.	Test Items	Requirements	Judgment
2.1	Examination of Product	Meets requirements of product drawing.	Acceptable
Electrical Requirements			
2.2	Termination Resistance (Low Level)	Mated connectors with PCB. Measure device: Open-circuit 20mV max, Mesh currents 10mA 30 mΩ MAX initial, 20 mΩ MAX changed. Refer to Fig.5	Acceptable
2.3	Temperature Rising	Measure temperature rising by current 1.5A. EIA-364-70 Method 1	Acceptable
2.4	Normal Force	Normal force at 1.15mm spring height: 0.5N Min.	Acceptable
2.5	Durability	No. of Cycles: 1500 cycles. Stroke the spring top to min product height. Normal force at 1.15mm Spring height: 0.4N Min (Final)	Acceptable
Mechanical Requirements			
2.6	Vibration (Low Frequency)	Subject mated connectors to 10-55 Hz traversed in 1 minute at 1.52 mm amplitude 2 hours each of 3 mutually perpendicular planes. No Electrical discontinuity greater than 1μsec. shall occur.	Acceptable

Fig. 2(to be continued)

Para.	Test Items	Requirements	Judgment
2.7	Mechanical Shock	Accelerated Velocity : 50 G Waveform : Half sine shock pluses Duration : 11 m sec. No Electrical discontinuity greater than 1μsec. shall occur.	Acceptable
2.8	Peeling Force	Operation speed: 5mm/min. 30N min at F1, F3, F4 direction, 20N min at F2 direction	Acceptable
2.9	Solderability	Wet Solder Coverage: 95% Min.	Acceptable
2.10	Temperature Life	Mated connector at 85°C, 96Hrs. Changed Resistance: 20mΩ Max. EIA-364-17, Method B, condition 3	Acceptable
2.11	Salt Spray	Mated connector on PCB, Changed Resistance: 20mΩ Max. Solution concentration 5%, temp. 35°C±2°C, Time: 24Hours EIA-364-26B, test condition B.	Acceptable
Environmental Requirements			
2.12	Thermal Shock	Mated connector at -55°C~85°C, 25cycles, Changed Resistance: 20mΩ Max. EIA-364-32F, Method A test condition I	Acceptable
2.13	Temperature-Humidity Cycling	Mated connector with PCB, Make 25~65°C, 90%~95% R. H. 24 hours a cycle, repeat 10 cycles. Change Resistance: 20mΩ Max. EIA-364-31B, Method IV	Acceptable
2.14	Resistance to Soldering Heat	Reflow 3 cycles No physical damage shall occur. EIA-364-56B	Acceptable

Fig. 2 (End)

3. Product Qualification Test Sequence

Items	Test /Group	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	p
1	4.1 Visual inspection	1,6	1,3	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,4	1,5	1,5	1,5	1,4	1
2	Plating Thickness	2													2		
3	4.2 Normal force	4,7		3,6	3,6	3,6	3,6	3,6	3,6	3,6	3,6	3,5	3,6	3,6			
4	4.3 Durability	5															
5	4.4 Radom Vibration			4													
6	4.5 Mechanical Shock				4												
6	4.6Vibration test					4											
7	4.7 Drop test						4										
8	4.8 LLCR	3,8		2,7	2,7	2,7	2,7	2,7	2,7	2,7	2,7	2,6	2,7	2,7	3,6		
9	4.9 Temperature rise							4									
10	4.10 Temperature life								4								
11	4.11 low temperature									4							
12	4.12Humidity- Temperature Cycling										4						
13	4.13 High-temperature and humidity												4				
14	4.14 Thermal shock													4			
15	4.15 Salt spray														4		
16	4.16 Surface Mount Solder-ability Test															3	
17	4.17 Resistance to Reflow Soldering Heat:															2	
18	4.18 Flux resistance / penetration																2
19	4.20 Solder peeling off strength		2														
	Sample size (pcs)	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15

Fig.3

(a) Numbers indicate sequence in which the tests are performed.

4. Test Results

sample Conditions	Measure Item	Unit	Results				Requirement	Judgment
			n	AVE.	MAX.	MIN.		

Test group A								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	Plating thickness	um	15	0.37	0.41	0.34	0.25um min.	Acceptable
	LLCR	mΩ	15	26.34	28.51	24.54	30 mΩ MAX	Acceptable
	Normal Force	N	15	0.91	0.98	0.85	0.5N min.	Acceptable
Mechanical	Durability	-	15	No abnormalities			1500 Cycles	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	Normal Force	N	15	0.81	0.87	0.72	0.4N min.	Acceptable
	△LLCR	mΩ	15	4.71	6.64	1.84	20 mΩ MAX	Acceptable

Test group B								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
Peeling strength	Peeling force	F1	6	48	51	45	30N min unbend direction, 20N min bend direction	Acceptable
		F2	6	26	28	23		
		F3	6	35	37	32		
		F4	6	34	36	31		
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable

Test group C								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	LLCR	mΩ	15	25.91	28.42	23.84	30 mΩ MAX	Acceptable
	Normal Force	N	15	0.92	1.01	0.86	0.5N min.	Acceptable
Mechanical	Vibration Low frequency	-	15	No discontinuity			1μs MAX	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	△LLCR	mΩ	15	2.84	3.84	-1.81	20 mΩ MAX	Acceptable
	Normal Force	N	15	0.82	0.88	0.75	0.4N min.	Acceptable

Fig.4 (To be continued)

Sample	Measure Item	Unit	Results				Requirement	Judgment
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Conditions			n	AVE.	MAX.	MIN.		
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Test group D								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	LLCR	mΩ	15	27.05	28.46	24.31	30 mΩ MAX	Acceptable
	Normal Force	N	15	0.91	0.99	0.84	0.5N min.	Acceptable
Mechanical	Mechanical shock	-	15	No discontinuity			1μs MAX	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	ΔLLCR	mΩ	15	2.64	3.37	-1.61	20 mΩ MAX	Acceptable
	Normal Force	N	15	0.84	0.89	0.71	0.4N min.	Acceptable

Test group E								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	LLCR	mΩ	15	26.16	27.95	23.96	30 mΩ MAX	Acceptable
	Normal Force	N	15	0.92	1.00	0.86	0.5N min.	Acceptable
Mechanical	Vibration test	-	15	No discontinuity			1μs MAX	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	ΔLLCR	mΩ	15	1.82	3.71	-1.62	20 mΩ MAX	Acceptable
	Normal Force	N	15	0.81	0.88	0.73	0.4N min.	Acceptable

Test group F								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	LLCR	mΩ	15	26.31	28.36	24.22	30 mΩ MAX	Acceptable
	Normal Force	N	15	0.90	0.97	0.83	0.5N min.	Acceptable
Mechanical	Drop test	-	15	No discontinuity			1μs MAX	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	ΔLLCR	mΩ	15	1.82	4.05	-0.61	20 mΩ MAX	Acceptable
	Normal Force	N	15	0.79	0.88	0.71	0.4N min.	Acceptable

Fig.4 (To be continued)

Sample Conditions	Measure Item	Unit	Results				Requirement	Judgment
			n	AVE.	MAX.	MIN.		

Test group G								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	LLCR	mΩ	15	26.50	28.62	24.71	30 mΩ MAX	Acceptable
	Normal Force	N	15	0.92	0.99	0.85	0.5N min.	Acceptable
Environmental	Temperature rise	-	15	No discontinuity			30°C MAX	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	ΔLLCR	mΩ	15	1.96	4.21	-1.82	20 mΩ MAX	Acceptable
	Normal Force	N	15	0.77	0.86	0.70	0.4N min.	Acceptable

Test group H								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	LLCR	mΩ	15	26.44	28.34	23.96	30 mΩ MAX	Acceptable
	Normal Force	N	15	0.93	1.02	0.83	0.5N min.	Acceptable
Environmental	Temperature life	-	15	No discontinuity			No abnormalities	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	ΔLLCR	mΩ	15	3.01	5.74	-0.67	20 mΩ MAX	Acceptable
	Normal Force	N	15	0.77	0.88	0.68	0.4N min.	Acceptable

Test group I								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	LLCR	mΩ	15	25.79	28.23	24.34	30 mΩ MAX	Acceptable
	Normal Force	N	15	0.93	1.03	0.87	0.5N min.	Acceptable
Environmental	Low temperature	-	15	No discontinuity			No abnormalities	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	ΔLLCR	mΩ	15	4.96	8.77	2.44	20 mΩ MAX	Acceptable
	Normal Force	N	15	0.81	0.87	0.73	0.4N min.	Acceptable

Fig.4 (To be continued)

Sample Conditions	Measure Item	Unit	Results				Requirement	Judgment
			n	AVE.	MAX.	MIN.		

Test group J								
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Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	LLCR	mΩ	15	26.81	28.31	24.00	30 mΩ MAX	Acceptable
	Normal Force	N	15	0.92	1.01	0.83	0.5N min.	Acceptable
Environmental	Humidity-temperature cycling	-	15	No discontinuity			No abnormalities	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	ΔLLCR	mΩ	15	6.81	10.45	2.94	20 mΩ MAX	Acceptable
	Normal Force	N	15	0.78	0.88	0.69	0.4N min.	Acceptable

Test group K								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	LLCR	mΩ	15	26.52	28.64	23.77	30 mΩ MAX	Acceptable
	Normal Force	N	15	0.93	0.99	0.83	0.5N min.	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	Normal Force	N	15	0.82	0.89	0.72	0.4N min.	Acceptable
	ΔLLCR	mΩ	15	1.84	2.21	-1.25	20 mΩ MAX	Acceptable

Test group L								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	LLCR	mΩ	15	27.15	29.21	25.46	30 mΩ MAX	Acceptable
	Normal Force	N	15	0.89	0.97	0.84	0.5N min.	Acceptable
Environmental	High-temperature and humidity	-	15	No discontinuity			No abnormalities	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	ΔLLCR	mΩ	15	5.61	10.61	4.96	20 mΩ MAX	Acceptable
	Normal Force	N	15	0.78	0.86	0.71	0.4N min.	Acceptable

Fig.4 (To be continued)

Sample Conditions	Measure Item	Unit	Results				Requirement	Judgment
			n	AVE.	MAX.	MIN.		

Test group M								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	LLCR	mΩ	15	26.54	28.44	24.54	30 mΩ MAX	Acceptable
	Normal Force	N	15	0.91	1.00	0.83	0.5N min.	Acceptable

Enviromental	Thermal shock	-	15	No discontinuity			No abnormalities	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	ΔLLCR	mΩ	15	5.57	9.11	3.15	20 mΩ MAX	Acceptable
	Normal Force	N	15	0.80	0.88	0.72	0.4N min.	Acceptable

Test group N								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	Plating thickness	um	15	0.37	0.44	0.35	0.25um min.	Acceptable
	LLCR	mΩ	15	26.32	28.41	23.64	30 mΩ max.	Acceptable
Enviromental	Salt spray	-	15	No abnormalities			No abnormalities	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
	ΔLLCR	mΩ	5	6.37	10.98	2.94	20 mΩ MAX	Acceptable

Test group O								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
Enviromental	Resistance to reflow soldering heat	-	15	No abnormalities			No abnormalities	Acceptable
	Surface Mount Solder-ability Test		15	No abnormalities			No abnormalities	Acceptable
Final	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable

Fig.4 (To be continued)

Test group P								
Initial	Examination of Product	-	15	No abnormalities			No abnormalities	Acceptable
Enviromental	Flux resistance / penetration	-	15	No abnormalities			No abnormalities	Acceptable

Fig.4 (End)

