POSITIVE LOCK MARK-II Receptacle Housing, . 250Series Material Evaluation

1. INTRODUCTION

1.1 Purpose

Testing was performed on the TE Connectivity POSTIVE LOCK MARK-II receptacle housing to evaluate a new material.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of POSTIVE LOCK MARK-II receptacle housing. The specimens listed in Table 1 of paragraph 1.4 were subject to the test sequence outlined in Table 2 of paragraph 1.5. Testing was performed at the Shanghai Electrical Components Test Laboratory during 11Nov2017 to 11Jan2018. The associated test number is TP-17-03158, TP-17-02994, and TP-18-00093

1.3 Conclusion

Based on the test results, all specimens meet the specification. See summary of testing for more details. 4-520935-1 and 4-520935-2 and 2-521229-2 parts are qualified based on similarity to 521229 parts.

1.4 Test Specimens

Specimens with the following part number as Table 1 were used for this test. Refer to table 1 for test specimen identification information.

Table 1

Test Group	Part No	Description	Qty.	Comments
1	1-521229-1	.250 PL EXII & FASTON 250 HSG 2P	6	
	63097-1	.250 PL RECEPTACLE 18-14 AWG TPBR	12	
2	1-521229-1	.250 PL EXII & FASTON 250 HSG 2P	7	
	63097-1	.250 PL RECEPTACLE 18-14 AWG TPBR	14	
3	1-521229-1	.250 PL EXII & FASTON 250 HSG 2P	6	
4	1-521229-1	.250 PL EXII & FASTON 250 HSG 2P	6	

1.5 Test Sequence

Specimens identified in table 1 were subjected to the test sequence outlined in Table 2.

Table 2-Test sequence

Test	Test Group			
	1	2	3	4
	Test Sequence			
Examination of Product	1		1,3	1,3
Dielectric withstanding Voltage	2			
Contact Intention Force		1		
Contact Retention Force		2		
Mold Stress Test				2
GWT 750℃			2	

Note:
a). Test group defined per customer requirement;
b). Numbers indicate sequence in which tests are performed.

1.6 Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:
Temperature: 15°C to 35°C
Relative Humidity: 25% to 75%

2. SUMMARY OF TESTING

2.1 Dielectric test, 3400V AC

No dielectric breakdown occurred due to the application of a test voltage potential of 3400VAC, refer to table 3

Table 3-leakage current, test set 1

Specimen ID	3-1	3-2	3-3	3-4	3-5	3-6
contact-housing	NO BREAKDOWN	NO BREAKDOWN	NO BREAKDOWN	NO BREAKDOWN	NO BREAKDOWN	NO BREAKDOWN
Adjacent contacts	NO BREAKDOWN	NO BREAKDOWN	NO BREAKDOWN	NO BREAKDOWN	NO BREAKDOWN	NO BREAKDOWN

2.2 Contact insertion force test

Refer to table 4 for contact insertion force summary data in pounds and figure 1 for typical contact insertion force profile plots. All recorded values were summarized as below.

Table 4-Contact insertion force summary data in pounds, test set 2

Pounds	Contact insertion force
Minimum	4.47
Maximum	6.69
Mean	5.48
Standard Deviation	0.69
N=	14
Requirement	

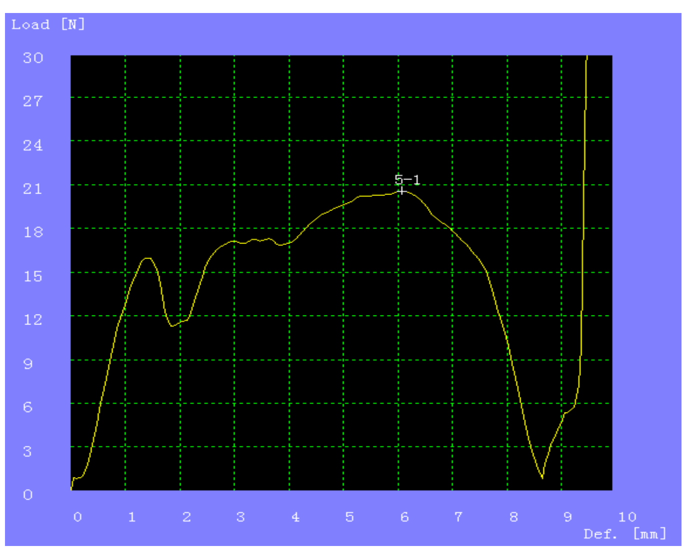

Figure 1- typical contact insertion force profile plot

2.3 Contact retention force

Refer to table 5 for contact retention force summary data in pounds and figure 2 for typical retention force profile plot. Table 5 is the test data for sequence 2, All recorded values were up the requirement of 13.0 lbf Min for contact retention force per test request.

Table 5-Contact retention force summary data in pounds, test set 2

Pounds	Contact retention force
Minimum	41.91
Maximum	44.51
Mean	43.32
Standard Deviation	0.81
Count	14
Requirement	13.0 lbf Min

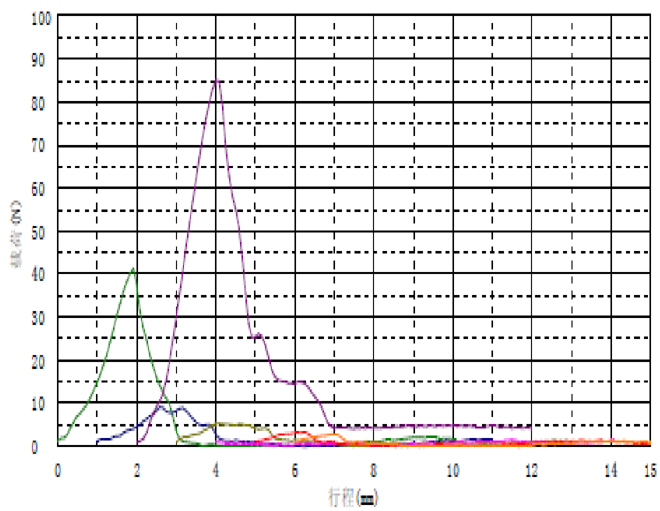

Figure 2- typical retention force profile plot

2.4 Mold stress test

No warpage, shrinkage, distortion, or other physical damage that would be detrimental to product performance was visible due to exposure to the mold stress test. The specimens exhibited a slight color change during exposure. Refer to figure 3 for typical before and after images.

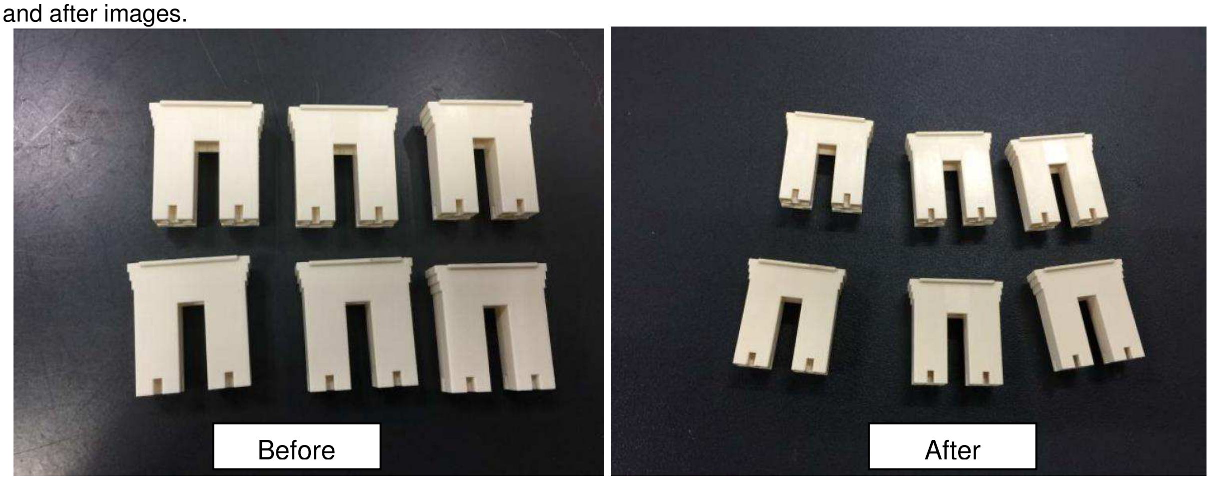

Figure 3- typical specimens following mold stress test

2.5 GWT 750℃

Refer to table 6 for GWT 750 ℃ test result, no physical damage shown in the test process, find detail information as below. And refer to figure 3 for typical GWT 750℃ test visual check record.

Table 6 – GWT 750℃ test result

Sample No	Examination	Initial	Final					
			Ti (sec)	Te (sec)	Flame Height (cm)	Drops (yes/no)	Light tissue paper burns (yes/no)	Judgment
1	GWT 750℃	No physical damage	0	0	0	NO	NO	Meet Spec.
2	GWT 750℃	No physical damage	0	0	0	NO	NO	Meet Spec.
3	GWT 750℃	No physical damage	0	0	0	NO	NO	Meet Spec.

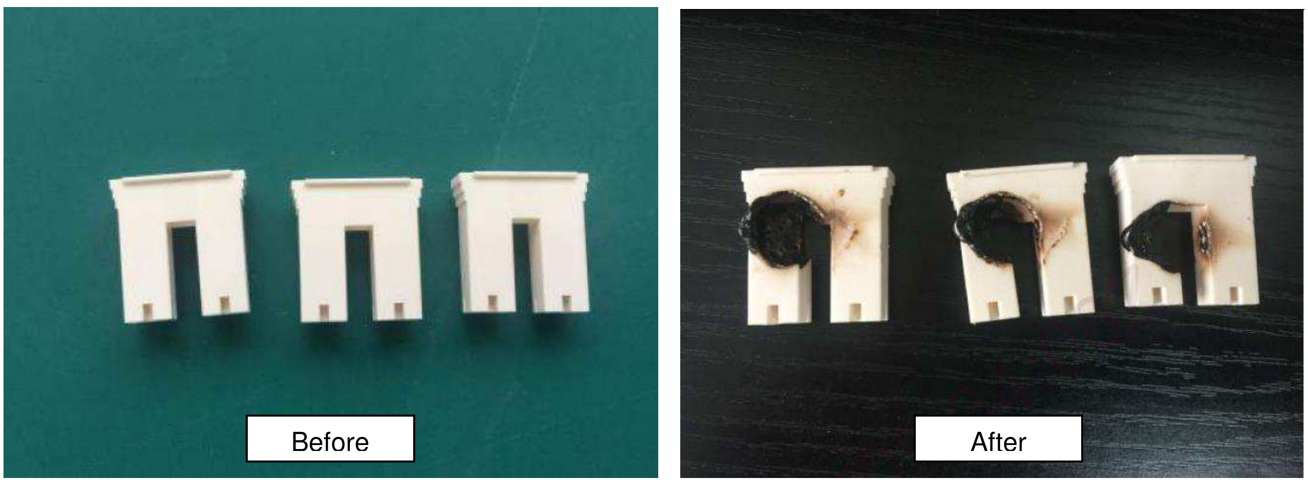

Figure 3 – visual check for GWT 750℃ test

3. TEST PROCEDURES

3.1 Examination of Product
Visual Inspection: appearance, and function of specimens pursuant to the applicable inspection plan.
Requirements: Meets requirements of product drawing and no physical damage.
Test Method: EIA-364-18 B

3.2 Dielectric Strength

The test specimens were tested in the as-specified state. The test voltage shall be raised from zero to the specified value as uniformly as possible, at a rate of approximately 500 volts (AC or DC) per second. Dielectric withstanding voltage was measured separately between the closest adjacent contacts at 3400 V for 1 minute. Take picture of initial testing to make insurance of the same method is used. Measure and record the performance of the specimens. Execute visual check after test.

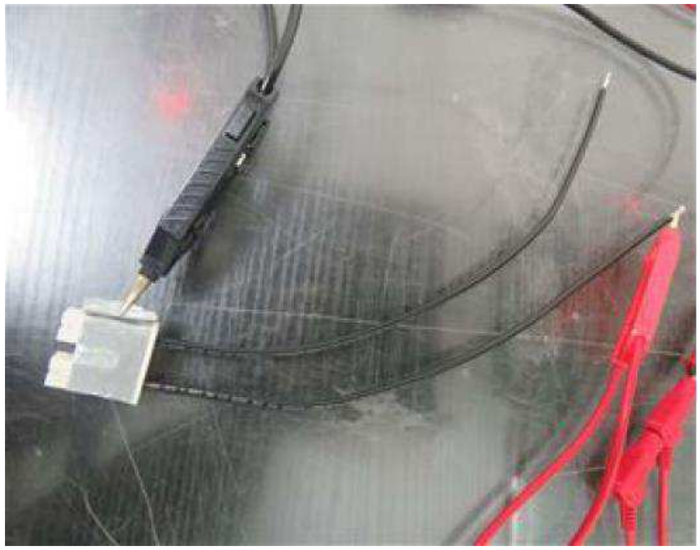

Figure 4-DWV test setup

3.3 Contact insertion force

Execute visual check before test, and take picture. Mount test specimen with fixtures in a normal manner, and take picture. Edit test procedure according to test method then perform test. Test Condition: Measure the force required to insert contact into housing. Test Speed: 25.4 mm/min. Export test data and test curve, execute visual check and take picture after test. Refer to figure 5 for an image of the typical test setup. Testing was performed in accordance with EIS-364-05B

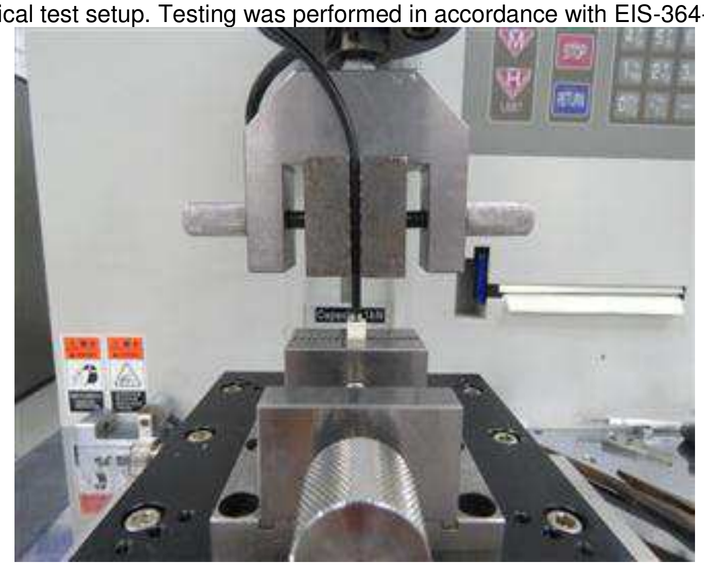

Figure 5 – typical contact insertion force setup

3.4 contact retention force

The housing was clamped to a free floating x/y and rotational table at the base of the tensile/compression machine. The wire of the terminal was clamped in an air jaw to the moveable crosshead of the tensile/compression machine. Force was then applied in an upward direction at a rate of 100 mm/min until the terminal was fully removed from the housing. Refer to figure 6 for an image of typical test setup.

Figure – 6 typical retention force setups

3.5 mold stress test

receptacle housing specimens was exposure to a temperature of 140℃ for a duration of 7.0 hours in a circulating-air oven. Following the exposure, the specimens were removed from the oven and allowed to cool to room ambient temperature before determining compliance. Testing was performed in accordance with UL1977-3th edition.

3.6 GWT 750℃ test

Specimens, wooden board and wrapping tissue were preconditioned under the condition of 25℃ and 50% R.H. for 24h.

- Execute visual check before test, and take picture.
- Clamp test specimen with fixture in a suitable manner.
- Edit test procedure according to test method then perform test.

Test Condition:

- The extremity of the wire was positioned horizontally and brought into contact with the specimen with a force between 0.85N and 1.05N for a period of 30s.
- Penetration depth was less than 7mm, and wrapping tissue was positioned at a distance of (200±5) mm below the place where the glow-wire was applied to the specimen.

4. CALIBRATION

4.1 Calibration Statement

All equipment containing a calibration number is calibrated and traceable through TE Connectivity (TE).

4.2 Equipment List

Equipment Name	Calibration Number
Dielectric Strength Tester (Chroma 19073)	E-00057
Load Tester (MAX-1KN-H-2 500N)	E-00017
Temperature Chamber (Espec PHH-201)	E-00099

5. VALIDATION

Requested by:

_________________________________ _____/_____/_____
Product Engineer
TE Connectivity India Pvt Ltd.

Prepared by:

_________________________________ _____/_____/_____
Test Engineer
Shanghai Electrical Components Test Lab.

Approved by:

_________________________________ _____/_____/_____
Manager
Shanghai Electrical Components Test Lab.