250 Series FASTON* Housing Qualification

1. INTRODUCTION

1.1 Purpose

Qualification testing was performed on the TE Connectivity* (TE*) 250 Series FASTON Housing to determine its conformance to the requirements of Product Specification 108-161248 Rev A.

1.2 Scope

This report covers the environmental, electrical, and mechanical performance of the 250 Series FASTON Housing. Testing was performed at the Harrisburg Electrical Components Test Laboratory (HECTL) between 11-October-2023 to 15-February-2023. Detailed test data is on file and maintained at HECTL under EA20230379T.

1.3 Conclusion

The specimens listed in Paragraph 1.5 conformed to the electrical, mechanical, and environmental performance requirement listed in the Product Specification 108-161248 Rev A.

1.4 Product Description

The TE Connectivity FASTON housings are designed to be used with the FASTON terminal line. They come in sizes ranging from .312, .250, .205, .187 and .110 and are available in multiple positions and configurations. Included in this line are special connectors, including water valve connectors, microswitch connectors, gas valve connectors, and various other special application connectors. Many of these housings are available in both V-2 and V-0 rated materials. Translucent plastic insulating sleeves are available for use with FASTON receptacles and flags.

1.5 Test Specimens

The test specimens identified in Table 1 with the following part numbers were subjected to the test sequence listed in paragraph 1.6. The test specimens were representative of normal production lots.

Table 1 – Test Specimens

Test Set	Qty	Part Number	Description
1	6	2423313-1 Rev 6	FASTON, 2 Position Housing Receptacle, 250 SERIES (Yellow)
	6	2238196-3 Rev A	FASTON, .250 STD REC STR Terminal on 14 AWG
2	30	2423313-1 Rev 8	FASTON, 2 Position Housing Receptacle, 250 SERIES (Yellow)
	30	2238196-3 Rev A	FASTON, .250 STD REC STR Terminal on 14 AWG
3	6	2423313-1 Rev 5	FASTON, 2 Position Housing Receptacle, 250 SERIES (Yellow)
	6	2238196-3 Rev A	FASTON, .250 STD REC STR Terminal on 14 AWG
4	6	2423314-1 Rev 5	FASTON, 1 Position Housing Receptacle, 250 SERIES (White)
	6	2238196-3 Rev A	FASTON, .250 STD REC STR Terminal on 14 AWG
5	6	2423314-1 Rev 5	FASTON, 1 Position Housing Receptacle, 250 SERIES (White)
	6	2238196-3 Rev A	FASTON, .250 STD REC STR Terminal on 14 AWG
6	30	2423314-1 Rev 7	FASTON, 1 Position Housing Receptaclewat, 250 SERIES (White)
	30	2238196-3 Rev A	FASTON, .250 STD REC STR Terminal on 14 AWG

1.6 Test Sequence

The test specimens referred to in paragraph 1.4 were tested according to the test sequences listed in Table 2.

Table 2 – Test Sequence

Test or Examination	Test Sets		
	1, 4	2, 6	3, 5
	Test Sequence (a)		
Examination of Product	1, 4	1, 4	1, 4
Insulation Resistance	2		
Dielectric Withstanding Voltage	3		3
Contact Insertion Force		2	
Contact Retention Force		3	
Mold Stress			4

a) *Numbers indicate the sequence in which tests were performed.*

1.7 Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15°C to 35°C
Relative Humidity: 20% to 80%

2. SUMMARY OF TESTING

2.1 Examination of Product

Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

2.2 Insulation Resistance

Specimens had an insulation resistance greater than 100 GΩ, meeting the 1,000 MΩ (1 GΩ) minimum requirement listed in the Product Specification.

2.3 Dielectric Withstanding Voltage

Specimens met the 5.0 mA maximum leakage current with no creeping discharge nor flashover thereby meeting the requirements listed in the Product Specification.

2.4 Contact Insertion Force

Specimens met the 26.7 Newton maximum requirement listed in the Product Specification. See Table 3 for a summary of the test results.

Table 3 – Contact Insertion Force Results in Newtons

Newtons	Test Set 2 (2 Pos. Housing)	Test Set 6 (1 Pos. Housing)
Minimum	5.89	7.76
Maximum	14.01	21.23
Mean	8.73	10.96
Count	30	30

2.5 Contact Retention Force

Specimens met the 50 Newton minimum retention force requirement listed in the Product Specification. See Table 4 for a summary of the test results.

Table 4 – Contact Retention Force Results in Newtons

Newtons	Test Set 2 (2 Pos. Housing)	Test Set 6 (1 Pos. Housing)
Minimum	55.26	65.06
Maximum	170.29	164.34
Mean	93.16	107.72
Count	30	30

2.6 Mold Stress

Specimens were visually examined and no evidence of warpage, shrinkage, degradation, or cracks were observed.

3. TEST METHODS

3.1 Examination of Product

Specimens were tested in accordance with EIA-364-18B. Specimens were visually examined with the unaided eye for signs of physical damage detrimental to product performance.

3.2 Insulation Resistance

Specimens were subjected to an insulation resistance test in accordance with EIA 364-21F. See Figure 1 for a representative image of testing. Insulation resistance was measured between the terminal and the housing of unmated specimens. Specimens were prepared for testing by inserting a terminal into the housing and wrapping a piece of foil around the housing. The positive test lead was applied to the terminal wire, and the negative test lead was applied to the wrapped foil. A test voltage of 500 volts DC was applied for two minutes before the resistance was measured.

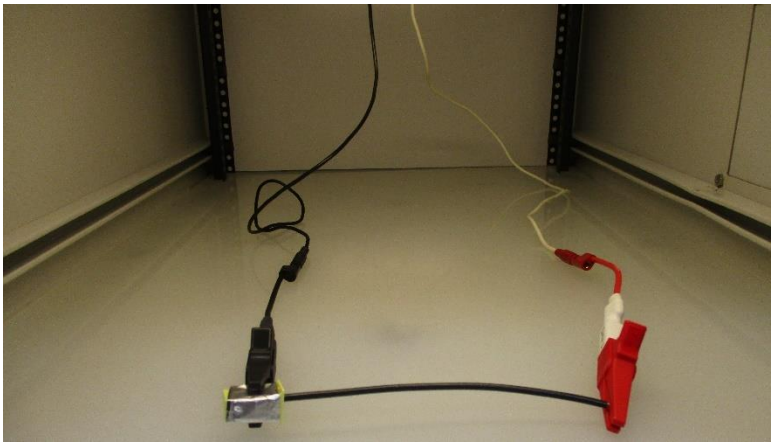

Figure 1 – Insulation Resistance and Dielectric Withstanding Voltage Test Setup

3.3 Dielectric Withstanding Voltage

Specimens were subjected to Dielectric Withstanding Voltage in accordance with UL 1977 4th Edition and EIA 364-20F, Method A, Condition I. See Figure 1 for representative images of the test setup. 2.2 kV_{AC} was applied between the contact and the surface of the housing and was held for 1 minute. The surface of the housing was wrapped in aluminum foil. Leakage current was measured and recorded at the end of each one minute hold.

3.4 Contact Insertion Force

Specimens were subjected to a contact insertion force in accordance with EIA 364-5C. See Figure 2 for a representative image of the test setup. A specimen was held in a vice with “L” shaped jaws attached to a free-floating XYR alignment table secured to the base of the tensile / compression machine. A terminal was held in a modified drill chuck fixture attached to the load cell and crosshead of the tensile / compression machine. The terminal was aligned above a contact cavity. The crosshead was lowered at a rate of 25.4 mm / min until the terminal was fully inserted into the specimen. The peak insertion force and force vs distance graph were recorded.

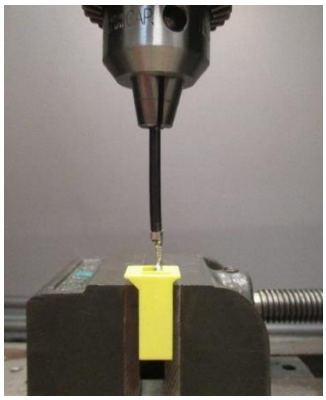

Figure 2 – Contact Insertion Force Test Setup

3.5 Contact Retention Force

Specimens were subjected to a contact retention force in accordance with EIA 364-29E. See Figure 3 for a representative image of testing. A specimen was held in a vice with “L” shaped jaws secured to a free-floating XYR alignment table attached to the base of the tensile / compression machine. A wire was held in air jaws attached to the load cell and crosshead of the tensile / compression machine. The crosshead was raised at a rate of 25.4 mm / min until the contact was removed from the housing. The peak extraction force and the force vs distance graph were recorded.

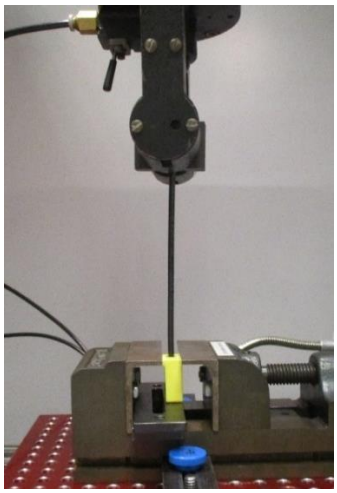

Figure 3 – Contact Extraction Force Test Setup

3.6 Mold Stress

Specimens were exposed to a mold stress environment in accordance with UL1977, 4th Edition. Specimens were exposed to 140°C for 7 hours in an air circulating oven. Specimens were then visually examined for warpage, shrinkage, degradation, or cracks.