.187 Series AMPLIVAR* FASTON* Flag Receptacle

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the .187 Series AMPLIVAR* FASTON* Flag Receptacles.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed on 31Mar03. Additional testing was completed on 05Oct04. The Qualification Test Report number for this testing is 501-552. This documentation is on file at and available from Engineering Practices and Standards (EPS).

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. Tyco Electronics Documents

- 109-197: AMP Test Specifications vs EIA and IEC Test Methods
- 114-2152: Application Specification
- 501-552: Qualification Test Report

2.2. Commercial Standards

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- UL-310: Electrical Quick-Connect Terminals

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3. Ratings

- Voltage: 240 volts AC
- Current: See Figure 4 for applicable current carrying capability
- Temperature: -40 to 105˚C

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per EIA-364.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low level contact resistance.	2.5 milliohms maximum. ΔR 2.0 milliohms maximum.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Temperature rise vs current.	30˚C maximum temperature rise at specified current.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1˚C. See Figure 4.
Current cycling.	Temperature rise of the conductor during the 500th cycle shall not be more than 15˚C higher than the temperature rise during the 24th cycle, and neither rise shall be more than 85˚C.	EIA-364-55. Subject specimens to 500 cycles of 45 minutes current ON and 15 minutes current OFF. See Figure 4.
MECHANICAL		
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition VII, Condition D. Subject mated specimens to 3.10 G's rms between 20-500 Hz. 15 minutes in each of 3 mutually perpendicular planes. See Figure 5.

Figure 1 (continued)

Test Description	Requirement	Procedure
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Method H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 5.
Durability.	See Note.	EIA-364-9. Mate and unmate specimens for 6 cycles at a maximum rate of 500 cycles per hour.
Mating force.	66.72 N [15 lbf] maximum.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Unmating force.	22.24 N [5 lbf] minimum for 1st unmating. 13.3 N [3 lbf] minimum for 6th unmating.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Termination tensile strength.	See Figure 4.	EIA-364-8. Determine crimp tensile at a maximum rate of 25.4 [1 in] per minute.
ENVIRONMENTAL		
Humidity-temperature cycling.	See Note.	EIA-364-31, Method III. Subject specimens to 10 cycles (10 days) between 25 and 65˚C at 80 to 100% RH.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4, Test Time Condition C. Subject mated specimens to 105˚C for 500 hours.

NOTE *Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.*

Figure 1 (end)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Initial examination of product	1	1	1	1
Low level contact resistance	3,7	2,8		
Temperature rise vs current		4,9		2,4
Current cycling				3
Vibration	5	7		
Mechanical shock	6			
Durability	4	3		
Mating force	2			
Unmating force	8			
Termination tensile strength			2	
Humidity-temperature cycling		5		
Temperature life		6		
Final examination of product	9	10	3	5

NOTE *(a) See paragraph 4.1.A.*
(b) Numbers indicate sequence in which tests are performed.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Each test group shall consist of a minimum of 6 specimens. Each specimen ID shall each consist of 24 specimens of the following wire type and crimp heights: 24 AWG Al and CU magnet wire at .041 crimp height; 20 AWG Al and Cu magnet wire at .046 crimp height; 18.5 AWG Al and Cu magnet wire at .053 crimp height; 16.5 AWG Al and Cu magnet wire at .059 crimp height; 17.5 AWG Al and Cu magnet wire at .058 crimp height; 14.5 AWG Al and Cu magnet wire at .070 crimp height; 14.5 AWG Al magnet wire and 18 AWG lead wire at .078 crimp height; 15.5 AWG Al magnet wire and 18 AWG lead wire at .074 crimp height; 18 AWG Cu magnet wire and 18 AWG lead wire at .066 crimp height; 22.5 and 18 AWG Al magnet wire at .057 crimp height; 17.5 and 21 AWG Al magnet wire at .059 crimp height;18 and 21 AWG Al magnet wire at .059 crimp height; and 20 AWG Al and Cu magnet wire at .049 crimp height.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 2.

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

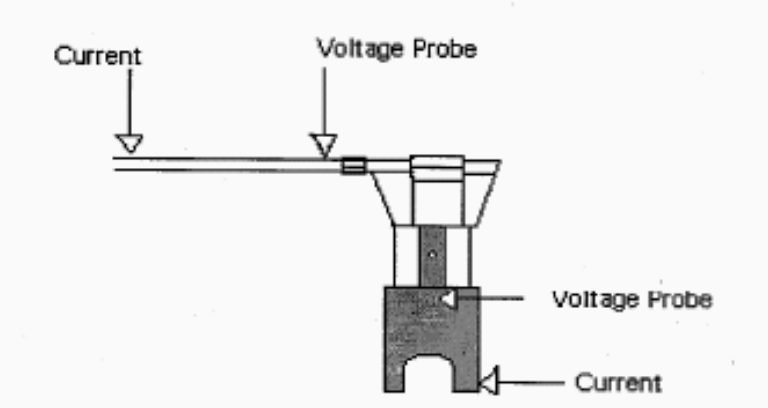

Figure 3
Low Level Contact Resistance Measurement Points

Wire Size		Current (amperes)		Tensile (N [lbf])	
Wire Gage	CMA	Copper	Aluminum	Copper	Aluminum
24	455	2.3	1.5	22.24 [5]	6.67 [1.5]
23.5	511	2.5	1.6	25.58 [5.75]	7.78 [1.75]
23	566	2.6	1.7	28.91 [6.5]	8.90 [2]
22.5	635	2.8	1.8	32.25 [7.25]	10.01 [2.25]
22	708	3	1.9	35.59 [8]	11.12 [2.5]
21.5	795	3.2	2.1	41.15 [9.25]	13.34 [3]
21	888	3.4	2.2	46.71 [10.5]	15.57 [3.5]
20.5	992	3.6	2.3	52.27 [11.75]	16.68 [3.75]
20	1116	4	2.6	57.83 [13]	17.79 [4]
19.5	1246	4.6	3	66.72 [15]	21.13 [4.75]
19	1391	5.3	3.4	73.40 [16.5]	24.47 [5.5]
18.5	1560	6.1	3.9	83.40 [18.75]	27.85 [6.26]
18	1747	7	4.5	93.41 [21]	31.14 [7]
17.5	1962	7.7	5	104.10 [23.4]	34.47 [7.75]
17	2190	8.3	5.4	117.88 [26.5]	37.81 [8.5]
16.5	2460	9	5.8	133.45 [30]	43.37 [9.75]
16	2746	10	6.5	147.90 [33.25]	48.93 [11]
15.5	3136	11.3	7.3	169.03 [38]	56.05 [12.6]
15	3446	12.4	8	186.83 [42]	62.28 [14]
14.5	3869	13.6	8.8	211.29 [47.5]	69.39 [15.6]
14	4330	15	9.7	235.76 [53]	77.84 [17.5]

NOTE

1. *CMA values are based on standard magnet wire with single film coating.*
2. *Current values for standard copper wire gages are from UL 310, others are rated based on their respective CMA.*
3. *Current values for aluminum wires are 64.5% of the copper wire of equivalent gage.*
4. *Tensile values are calculated at 50% of the bare wire tensile.*

Figure 4
Current Carrying/Tensile Capability

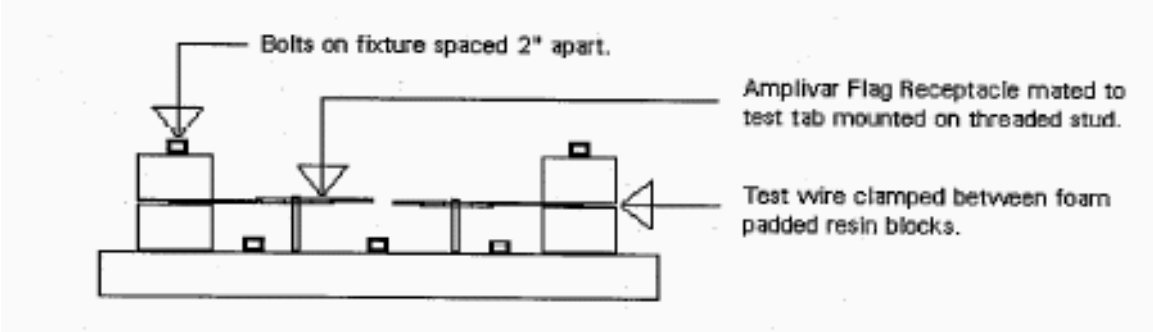

Figure 5
Vibration and Mechanical Shock Mounting Fixture