
High Current Card Edge Connector Assembly

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics High Current Card Edge Connector Assembly for VRM DC-to-DC convertor applications.

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 09Sep03. The Qualification Test Report number for this testing is 501-569. 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

- 108-9039: Product Specification
- 109-197: AMP Test Specifications vs EIA and IEC Test Methods
- 114-13018: Application Specification
- 501-569: Qualification Test Report

2.2. Commercial Standard

EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications

3. ENVIRONMENTAL CONDITIONS

The VRM design, including materials, should be consistent with the manufacture of units that meet the environmental requirements specified below.

3.1. Operating Temperature

The VRM shall meet all electrical requirements when operated over an ambient temperature of 0 to 45°C at full load with a minimum airflow of 400 LFM. Operating conditions shall be considered to include 10 cycles between minimum and maximum temperatures at a rate of 10°C per hour and a dwell time of 30 minutes at extremes.

3.2. VRM Board Temperature

To maintain the connector within its operating temperature range, the board temperature, at the connector interface, shall not exceed a temperature equal to 100°C. At no time during operation, is the board permitted to exceed 90°C within a distance of 2.54 mm [.100 in] from the top of the connector (10.16 mm [.4 in] from board edge). In order not to exceed 100°C, it is recommended that the board be constructed from 4 ounce copper cladding. The VRM board must contain gold lands (fingers) for interfacing with the VRM connector that are 1.27 ± 0.05 mm [.050 ± .002 in] wide by 5.08 mm [.200 in] minimum long and spaced 2.54 ± 0.05 mm [.100 ± .002 in] apart. Traces from the lands to the power plane should be a minimum of 0.89 mm [.035 in] wide and of a minimal length.

4. REQUIREMENTS

4.1. Design and Construction

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

4.2. Materials

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

4.3. Ratings

- Voltage: 400 volts (rms) at sea level
- Current: 6.05 amperes maximum per contact on each of 19 adjacent pairs
- Temperature: -55 to 105°C

4.4. 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.

4.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional © of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Insulation resistance.	5000 megohms minimum.	EIA-364-21. 500 volts DC. Test between adjacent contacts of unmated specimens.

Figure 1 (cont)

Test Description	Requirement	Procedure
Withstanding voltage.	1 minute hold with no breakdown or flashover. 5 milliamperes maximum leakage.	EIA-364-20, Condition I. 1000 volts AC at sea level for .100 centerline product, 1500 volts AC at sea level for .125 centerline product. Test between adjacent contacts of unmated specimens.
Temperature rise vs current.	Maximum connector temperature shall not exceed 90°C. See Note 1.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1°C. See Figure 3.
Temperature life with current cycling.	115 amperes DC at 45°C ambient.	Subject specimens to 50 cycles of 30 minutes ON and 15 minutes OFF.
MECHANICAL		
Vibration.	Non-operating VRM module shall not be damaged, dislodged or loosened. See Note 2.	EIA-364-28. Subject specimens mated with VRM module with a mass not to exceed 113.4 g [4 oz] (see Note (3)) to 0.02 G ² /Hz from 20 to 500 Hz. 10 minutes in each of 3 mutually perpendicular planes. See Figure 4.
Mechanical shock.	Non-operating VRM module shall not be damaged, dislodged or loosened. See Note 2.	EIA-364-27, Method A. Subject mated specimens to 35 G's half-sine shock pulses of 11 milliseconds duration. 1 shock in each direction applied along 3 mutually perpendicular planes, 6 total shocks. See Note 3 and Figure 4.
Durability.	See Note 2.	See Note 4.
Mating force.	19 ounces maximum per contact pair.	See Note 4.
Unmating force.	1.25 ounces minimum per contact pair.	See Note 4.
Contact retention.	Contact shall not dislodge from normal locking position.	EIA-364-29. Apply axial load of 4.5 pounds to contacts.

Figure 1 (cont)

Test Description	Requirement	Procedure
ENVIRONMENTAL		
Thermal shock.	See Note 2.	EIA-364-32, Test Condition VII. Subject unmated specimens to 5 cycles between -55 and 105°C.
Temperature life.	See Note 2.	EIA-364-17. Subject mated specimens to 105°C for 20 days (480 hours).
Mixed flowing gas.	See Note 2.	EIA-364-65. Subject mated specimens to environmental Class IIA for 14 days.

NOTE

- 1 *Ambient temperature of 45°C [140°F] and 400 LFM airflow along the specimen axis must be maintained.*
- 2 *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.*
- 3 *VRM modules for use with plastic latches must not exceed 4 ounces.*
- 4 *This test was not performed as part of the Qualification Test sequence for product covered by this specification. See Product Specification 108-9039 for details of these tests performed on similar products.*

Figure 1 (end)

4.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)	
	1	2
	Test Sequence (b)	
Initial examination of product	1	1
Insulation resistance		3,6
Withstanding voltage		4,7
Temperature rise vs current	2,8 (c)	
Temperature life with current cycling	5	
Vibration	6	
Mechanical shock	7	
Contact retention		2
Thermal shock		5
Temperature life	3(d)	
Mixed flowing gas	4	
Final examination of product	9	8

- NOTE**
- (a) See paragraph 5.1.A.
 - (b) Numbers indicate sequence in which tests are performed.
 - (c) Ambient temperature of 45°C [140°F] and 400 LFM airflow along specimen axis.
 - (d) Precondition specimens with 5 durability cycles.

Figure 2

5. QUALITY ASSURANCE PROVISIONS

5.1. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test groups shall consist of 6 specimens mounted on printed circuit boards. Where individual contact measurements are required, a minimum of 30 randomly selected contacts distributed among the specimens shall be measured.

B. Test Sequence

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

5.2. 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.

5.3. 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.

5.4. Quality Conformance Inspection

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

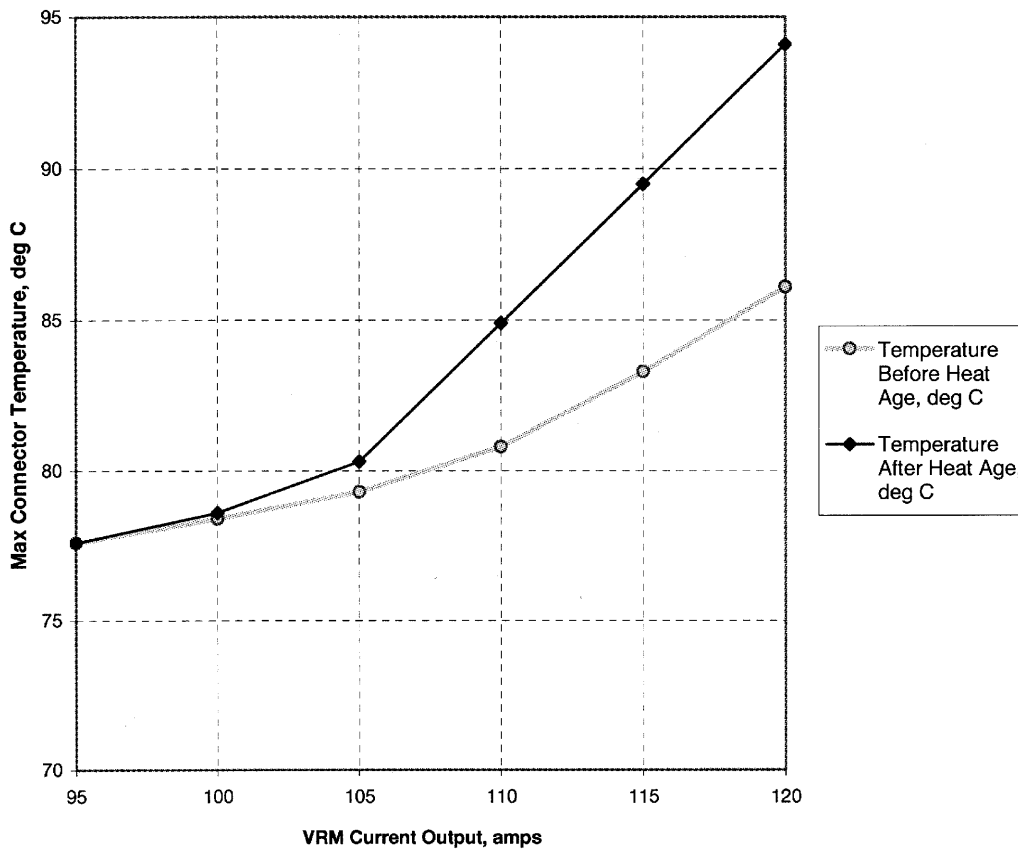


Figure 3
Temperature Rise vs Current

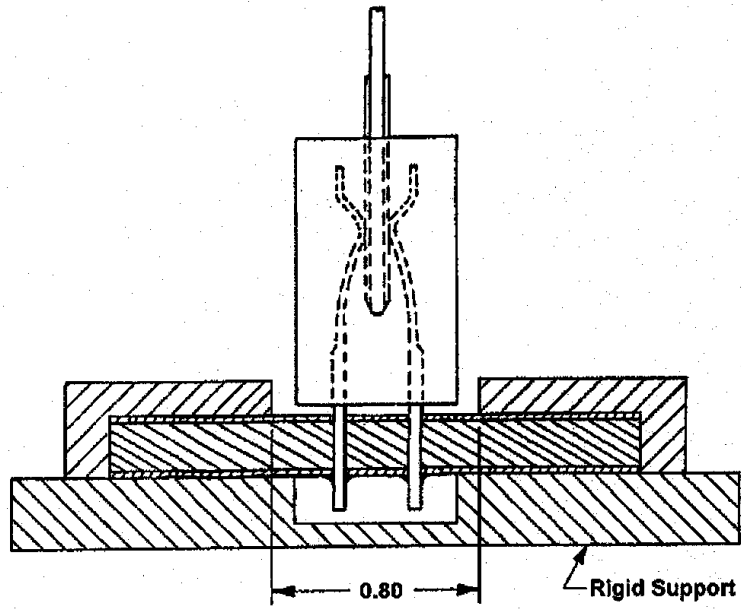


Figure 4
Vibration and Mechanical Shock Mounting Fixture