

**Standard Edge II Connector for VRM 9.1 Applications****1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics Standard Edge II connector for VRM 9.1 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 02May01. The Qualification Test Report number for this testing is 501-227-2. 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 (Connector, Standard Edge)
- 109-197: AMP Test Specifications vs EIA and IEC Test Methods
- 114-13018: Application Specification
- 501-227-2: 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 60°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 90°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 90°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: 4.26 amperes maximum per contact provided the number of contacts and wiring pattern are per the VRM 9.1 specification.
- Temperature: -55 to 90°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 (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
<b>ELECTRICAL</b>		
Temperature rise vs current.	30°C maximum temperature rise at specified current.	EIA-364-70. Measure temperature rise vs current.
Temperature life with current cycling.	81 amperes DC and 60°C.	Subject specimens to 50 cycles of 30 minutes ON and 15 minutes OFF.

Figure 1 (cont)

Test Description	Requirement	Procedure								
Dielectric withstanding voltage.	<table border="0"> <tr> <td>Test Voltage</td> <td>Centerline</td> </tr> <tr> <td>RMS</td> <td>Spacing</td> </tr> <tr> <td>1000</td> <td>.100</td> </tr> <tr> <td>1500</td> <td>.125</td> </tr> </table> 5 milliamperes maximum leakage.	Test Voltage	Centerline	RMS	Spacing	1000	.100	1500	.125	See Note 1.
Test Voltage	Centerline									
RMS	Spacing									
1000	.100									
1500	.125									
Insulation resistance.	5000 megohms minimum.	See Note 1.								
<b>MECHANICAL</b>										
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 170.10 g [6 oz] (see Note (b)) to 0.02 G <sup>2</sup> /Hz from 20 to 500 Hz. See Figure 3.								
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 50 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 Figure 3.								
Mating force.	19 ounces maximum per contact pair.	See Note 1.								
Unmating force.	1.25 ounces minimum per contact pair.	See Note 1.								
Contact retention.	Contact shall not dislodge from normal locking position.	See Note 1								
<b>ENVIRONMENTAL</b>										
Temperature life.	See Note 3.	EIA-364-17. Subject mated specimens to 120°C for 240 hours.								
Mixed flowing gas.	See Note 3.	EIA-364-65. Subject mated specimens to environmental Class IIA for 14 days.								
Thermal shock.	See Note 1	See Note 1.								
Humidity, steady state.	See Note 1.	See Note 1.								

- NOTE**
- 1 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.
  - 2 VRM modules for use with plastic latches must not exceed 3 ounces.
  - 3 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)

4.6. Product Qualification and Requalification Test Sequence

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

- NOTE**
- (a) See paragraph 5.1.A.
  - (b) Numbers indicate sequence in which tests are performed.
  - (c) Ambient temperature of 60°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 group 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 functional requirements shall be in accordance with the applicable product drawing and this specification.

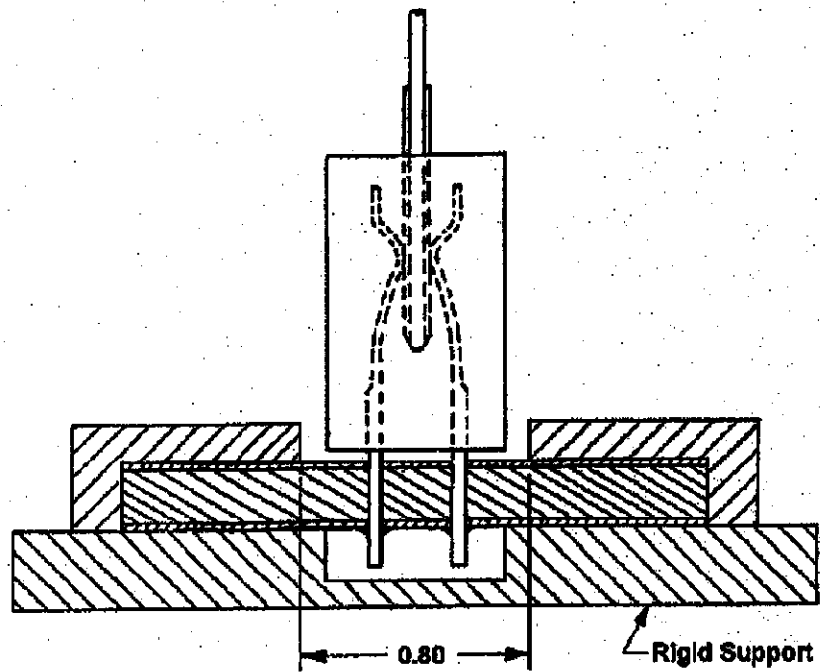


Figure 3  
Vibration Mounting Fixture