

Right Angle AMC B+ Card Edge Connector**DESIGN OBJECTIVES**

The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore Tyco Electronics makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, Tyco Electronics may change these requirements based on the results of additional testing and evaluation. Contact Tyco Electronics Engineering for further details.

1. SCOPE**1.1. Content**

This specification covers performance, tests and quality requirements for the Tyco Electronics Right Angle AMC B+ Card Edge Connector.

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.

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 Series: Test Specifications as indicated in Figure 1
- 109-197: Test Specification (AMP Test Specifications vs EIA and IEC Test Methods)
- 114- : Application Specification
- 501- : Qualification Test Report (Right Angle AMC B+ Card Edge Connector)

2.2. Industry Standards

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- GR-1217-CORE: Generic Requirements For Separable Electrical Connectors Used In Telecommunications Hardware
- IEC 60512: Electromechanical Components For Electronic Equipment; Basic Testing Procedures and Measuring Methods Part 1: General

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.

PRELIMINARY

3.3. Ratings

- Voltage: 1.7 to 1.9 volts DC
- Current: Signal application only
- Temperature: -10 to 70°C
- Humidity: 10 to 90%, non-condensing

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.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing.	IEC 60512-2, Test 3A. Visual and dimensional (C of C) inspection per product drawing. (Connector interface, interface dimensions of plug-in card, and creepage and clearance distances).
Final examination of product.	Meets visual requirements. No defect that would impair normal operation.	IEC 60512-2, Test 3A. Visual inspection.
ELECTRICAL		
Low level termination resistance.	60 milliohms maximum initial. ΔR 15 milliohms maximum.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage.
Insulation resistance.	100 megohms minimum between differential pair conductors mutually and between ground; between general purpose conductors mutually and between ground; and between power conductors mutually and between ground. 10 megohms after humidity.	IEC 60512-2, Test 3A, Test Voltage 80 volts rms, Method B.
Voltage proof.	One minute hold with no breakdown or flashover.	IEC 60512-2, Test 4A, Method B. Mated plug-in cards. Test voltage 80 volts rms. between differential pair conductors mutually and ground; between general purpose conductors mutually and ground; and between power conductors mutually and ground.

Figure 1 (continued)

Test Description	Requirement	Procedure
Electrical load at temperature.	Internal specimen temperature shall not exceed 100°C.	IEC 60512-3, Test 5B. Mated specimens. All lines driven simultaneously. Electrical load shall be 0.1 ampere per differential pair; 1.52 amperes per power conductor; and 0.3 ampere per general purpose and ground conductors. Wire gauge thermo-element shall be 0.12 mm ² maximum.
Differential impedance.	Average impedance and peak values 100 ± 10 ohms. Including contact pads and via holes.	IEC 60512 -23D, Test Method B. Measured step rise time 30 ps maximum throughout interconnection. Environmental impedance 100 differential 8 differential pair lines per specimen. See Figure TBD.
Crosstalk.	< 2% (far end) between adjacent pairs; between 1 quiet pair and 2 surrounding driven pairs; and between facing lines on component side 1 and component side 2.	IEC 60512-25, Test 25A. Measured step rise time 25 ps maximum. throughout interconnection. Environment impedance 100 ohm differential. Near end and far end cross talk between 2 adjacent differential pairs. Simultaneous cross talk with two surrounding driven pairs. See Figure TBD.
Attenuation.	> -1 dB at 8 GHz. > -2 dB at 12 GHz. > -4 dB at 18 GHz.	IEC 60512-25, Test 25B. Environment impedance 100 ohms differential. Frequency range 0 to 20 GHz. Four differential per specimen. See Figure TBD.
Return loss.	< -20 dB at 5 GHz. < -13 dB at 8 GHz. < -8 dB at 18 GHz.	IEC 60512-25-5, Test 23E. Environment impedance 100 ohms differential. Frequency range 0 to 20 GHz. Four differential per specimen. See Figure TBD.
MECHANICAL		
Vibration, sinusoidal.	No discontinuities of 1 microsecond or longer duration. See Note.	IEC 60512-4, Test 6D. Frequency 10 to 500 Hz, amplitude 0.35 mm or 50 m/s ² , 8 hours in each of 3 mutually perpendicular planes, 32 sweepings in each direction. See Figure TBD.

Figure 1 (continued)

Test Description	Requirement	Procedure
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	IEC 60512-4, Test 6C. 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 TBD.
Durability.	See Note.	IEC 60512-5, Test 9A. Mate and unmate specimens for 100 cycles at a maximum speed of 10 mm per second with a 5 second rest in the unmated condition.
Gage retention force.	Gage shall be kept up.	IEC 60512-8, Test 16e. Sizing gage thickness shall be 1.76 ± 0.01 mm. Thickness of retention force gage shall be 1.44 ± 0.01 mm. Weight of retention force gage shall be 15 grams.
Engaging and separating forces.	100 N maximum engaging force. 65 N maximum separating force.	IEC 60512-7, Test 13a. Plug in card insertion and extraction at a maximum speed of 10 mm per second.
Static load transverse.	See Note.	IEC 60512 -8a. Apply a force of 204 N to the front edge of the module PCB and hold for 1 minute.
Minute disturbance.	See Note.	Unmate and mate each specimen a distance of approximately 0.1 mm.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-35C. Subject specimens to 5 cycles between -55 and 85°C with 30 minutes dwells at each temperature extreme and 5 seconds maximum transfer time between temperature extremes.
Humidity/temperature cycling.	See Note.	EIA-364-31B, Method III. Subject specimens to 50 cycles (500 hours) between 25 and 65°C at 80 to 98% RH. According to GR-1217-CORE, Section 6.3.4, R6-64.

Figure 1 (continued)

Test Description	Requirement	Procedure
Temperature life, preconditioning.	See Note.	EIA-364-17, Test Condition 4. Subject mated specimens to 105°C for 300 hours. Two hour recovery time.
Temperature life, long term.	See Note.	EIA-364-17, Test Condition 4. Subject mated specimens to 105°C for 1000 hours. Two hour recovery time. According to GR-1217-CORE, Sections 6.3.2 R6-51.
Mixed flowing gas, unmated.	See Note.	EIA-364-65A Class IIA. Subject unmated specimens to 5 days exposure.
Mixed flowing gas, mated.	See Note.	EIA-364-65A Class IIA. Subject mated specimens to 5 days exposure.
Dust.	See Note.	EIA-364-91. Subject unmated and mounted connectors and module PCB's for 1 hour to a benign dust concentration of 300 g/m ³ of chamber volume and a flow rate of 300 m per second. According to GR-1217-CORE, Sections 9.1.1.1 and 9.1.1.2.

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)

DESIGN OBJECTIVES 10Jan07

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)								
	1	2	3	4	5	6	7	8	9
	Test Sequence (b)								
Initial examination of product	1	1	1	1	1	1	1	1	1
Low level termination resistance	4,6,8,10,12,14,16,18,20	4,6,8,10,12,14		4,6,8,10,12			4,6		
Insulation resistance						4,9			
Voltage proof						5,10			
Electrical load at temperature								2	
Differential impedance									4
Crosstalk									5
Attenuation									6
Return loss									7
Vibration, sinusoidal.		9	6						
Mechanical shock		11	7						
Durability	5,19	5,13	4	5	4	6			2
Gage retention force	2	2	2	2	2	2	2		
Engaging and separating forces	3	3,15	3	3	3	3	3,8		
Static load transverse		16					7		
Minute disturbance	17								
Thermal shock				9	6	7			
Humidity/temperature cycling				11		8			3
Temperature life, preconditioning	7								
Temperature life, long term							5		
Mixed flowing gas, unmated	9,11								
Mixed flowing gas, mated	13,15								
Dust		7	5	7	5				
Final examination of product	21	17	8	13	7	11	9	3	8

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. All test groups shall each consist of a minimum of 5 specimens.

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.