
SEC-Z Card Edge Connector

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics SEC-Z standard card edge connector used in PC servers. The tested connector had 440 contacts arranged with 220 contacts in both the upper and lower rows. The upper and lower rows are in line.

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 08Jul03. The Qualification Test Report number for this testing is 501-565. 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
- 501-565: Qualification Test Report

2.2. Industry Standard

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

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: 203 volts AC
- Current: Signal application only, 1 ampere per contact maximum measured over 5 adjacent, fully energized contacts
- Temperature: -55 to 85°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.	20 milliohms maximum average per contact initial. ΔR 10 milliohms maximum.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. Measure on both signal and ground contacts.
Insulation resistance.	1000 megohms minimum.	EIA-364-21. 100 volts DC. Test between adjacent contacts of mated specimens. Measure in signal to signal, signal to ground, and ground to ground configurations.
Withstanding voltage.	1 minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 500 volts AC at sea level. Test between adjacent contacts of mated specimens. Measure in signal to signal, signal to ground, and ground to ground configurations.
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. 30 minutes in each of 3 mutually perpendicular planes.

Figure 1 (cont)

Test Description	Requirement	Procedure
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Method A. Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Durability.	See Note.	EIA-364-9. Mate and unmate specimens for 25 cycles at a maximum rate of 600 cycles per hour.
Mating force.	10 ounces maximum per quad contact.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Unmating force.	0.5 ounce minimum per quad contact.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Reseating.	See Note.	EIA-364-1001. Manually mate and unmate the connector 3 times.
ENVIRONMENTAL		
Thermal shock (1).	See Note.	EIA-364-32. Subject mated specimens to 10 cycles between -40 and 60°C. 30 minute dwells at temperature extremes.
Thermal shock (2).	See Note.	EIA-364-32, Test Condition I. Subject Mated specimens to 10 cycles between -55 and 85°C. 60 minute dwells at temperature extremes.
Humidity-temperature cycling (1).	See Note.	EIA-364-31, Method III. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 95% RH.
Humidity-temperature cycling (2).	See Note.	EIA-364-31. Subject mated specimens to 24 cycles (3 hours each cycle) between 25 and 65°C. 1 hour dwell at temperature extremes with .5 hour ramp times. Maintain RH at 80% at 25°C and 50% at 65°C.

Figure 1 (cont)

Test Description	Requirement	Procedure
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 3, Test Time Condition C. Subject mated specimens to 85°C for 500 hours.
Mixed flowing gas.	See Note.	EIA-364-65, Class IIA (4 gas). Subject mated and unmated specimens to environmental Class IIA for 20 days.

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	5	6
	Test Sequence (b)					
Initial examination of product	1	1	1	1	1	1
Low level contact resistance	2,5	3,8,10		2,4	4,6	2,4,6,8
Insulation resistance			2,6			
Withstanding voltage			3,7			
Vibration, random	3					
Mechanical shock	4					
Durability		5				
Mating force		2,6			2	
Unmating force		4,7			3,7	
Reseating						7
Thermal shock (1)		9	4			
Thermal shock (2)						3(c)
Humidity-temperature cycling (1)			5			
Humidity-temperature cycling (2)						5
Temperature life					5	
Mixed flowing gas				3(d)		
Final examination of product	6	11	8	5	8	9

NOTE

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Precondition with 10 durability cycles.
- (d) One half of the specimens shall be mated with the remaining half unmated with the daughter boards stored at ambient.

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. Test group 1 shall consist of 4 specimens on minimum thickness PCB and 4 specimens on maximum thickness PCB. Test groups 2 and 5 shall each consist of 5 specimens on minimum thickness PCB and 5 specimens on maximum thickness PCB. Test group 3 shall consist of 5 unmounted specimens. Test group 4 shall consist of 6 specimens on minimum thickness PCB and 6 specimens on maximum thickness PCB. Test group 6 shall consist of 5 specimens on maximum thickness PCB.

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.