
Serial ATA Connector

1. SCOPE

1.1. Contents

This specification covers the performance, tests and quality requirements for the Tyco Electronics Serial ATA 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 DOCUMENT

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

- TEC-109-201: Component Heat Resistance to Lead-Free Reflow Soldering.
- 501-118018: Qualification Test Report.

2.2. Commercial Standard

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications.
- JESD22-B102D: Solderability Test Method.

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

- A. Voltage: 12 volts DC.
- B. Current: 1.5 amperes.
- C. Temperature: -35 to 85°C.

3.4. Performance Requirement 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
Examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
ELECTRICAL		
Low level contact resistance.	30 mΩ maximum initial. ΔR15 mΩ maximum increase.	EIA-364-23. Subject specimens to 100 mA maximum and 20 mV maximum open circuit voltage.
Dielectric withstanding voltage.	1 minute hold with no breakdown, flashover, or 0.5 mA maximum leakage.	EIA-364-20, Condition I. 500 volts AC at sea level. Test between adjacent contacts of unmated specimens.
Insulation resistance.	1000 MΩ minimum.	EIA-364-21. Test between adjacent contacts of unmated specimens.
Contact current rating. (Power segment)	1.5 A per pin minimum. The temperature rise above ambient shall not exceed 30°C at any point in the specimen when contact positions are powered. The ambient condition is still air at 25° C.	EIA-364-70. 1. Mount the connector to a test PCB. 2. Wire power pins P2 and P3 in parallel for power. 3. Wire ground pins P5 and P6 in parallel for return. 4. Supply 6A total DC current to the power pins in parallel, returning from the parallel ground pins (P5 and P6). 5. Record temperature rise when thermal equilibrium is reached.
MECHANICAL		
Mating force.	20 N (2 Kgf) maximum.	EIA-364-13. Measure force necessary to mate specimens at a max. rate of 12.5 mm per minute.
Unmating force.	22 Position: 4 N (0.4 Kgf) minimum. 13 Position: 2.5 N (0.25 Kgf) minimum.	Measure force necessary to unmate the specimens at a max. rate of 12.5 mm per minute.
Contact retention force.	3 N per contact minimum.	EIA-364-29. Apply axial load to contacts in vertical direction.
Durability.	See NOTE	EIA-364-9. Mate and unmate specimens with test boards for 500 cycles at a maximum rate of 200 cycles per hour.
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See NOTE	EIA 364-28, Condition V, Test letter A. Subject mated specimens to 5.35 g's RMS. 30 minutes in each of three mutually perpendicular planes.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See NOTE .	EIA-364-27, Condition H. Subject mated specimens to 30 g's half-sine shock pulses of 11 milliseconds duration. There shocks in each direction applied along three mutually perpendicular planes For a total of 18 shocks.
Reseating	See NOTE	Manually unplug/plug three times.

Figure 1 (continued)

ENVIRONMENTAL		
Test Description	Requirement	Procedure
Thermal shock.	See NOTE	EIA-364-32, Condition I. Subject mated specimens to 10 cycles between -55 and 85°C
Humidity, steady state.	See NOTE	EIA 364-31, Method II, Condition A. Subject mated specimens to 96 hours at 40°C with 90% to 95% R.H.
Temperature life.	See NOTE	EIA-364-17, Method A, Condition C. Subject mated specimens to 85°C for 500 hours.
Solderability.	The inspected area of each lead must have 95% solder coverage minimum.	JESD22-B102D, Condition C. Steam Aging Preconditioning: 93 +3/-5°C, 8 hours ±15 min. Reflow Temperature: 230-245°C Reflow Time: 50-70 s.
Resistance to reflow soldering heat.	See NOTE	109-201, Condition B. Moisture Soak Preconditioning: 85°C and 85% R.H. for 168 hours. Preheat Temp.: 150-200°C, 60-180 s. Time over liquidus (217°C): 60-150 s. Peak Temp.: 260 +0/-5°C, 20-40 s. Duration: 3 cycles.
Salt spray.	No evident corrosion.	EIA-364-26, Condition B. Subject mated specimens to 5% salt at 35°C for 48 hours. After test, rinse the specimens with water and recondition the room temperature for 1 hour.

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)						
	A	B	C	D	E	F	G
	Test Sequence (b)						
Examination of product.	1, 5	1, 8	1, 8	1, 8	1, 5	1, 3	1, 3
Low level contact resistance.	2, 4	3, 6	2, 4, 6		2, 4		
Dielectric withstanding voltage.				3, 7			
Insulation resistance.				2, 6			
Contact current rating. (Power segment)			7				
Mating force.		2					
Unmating force.		7					
Contact retention force.						4	
Durability.	3						
Vibration, random.		4 (c)					
Mechanical shock.		5					
Reseating			5				
Thermal shock.				4			
Humidity, steady state.				5			
Temperature life.			3				
Solderability.							2
Resistance to reflow soldering heat.						2	
Salt spray.					3		

- NOTE**
- (a) See paragraph 4.1.A.
 - (b) Numbers indicate sequence in which test are performed.
 - (c) Durability preconditioning only 50 cycles required.

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

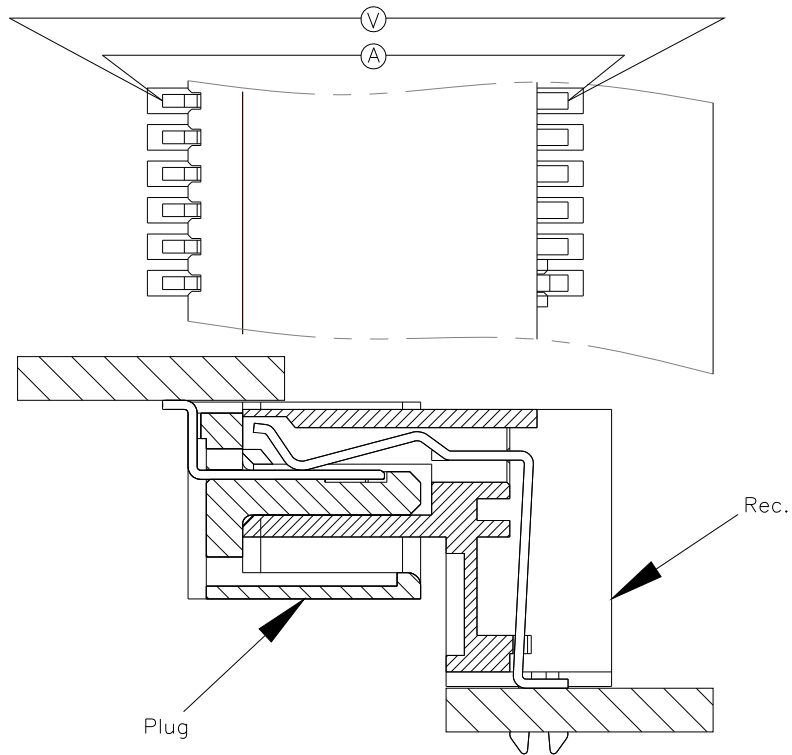
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

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.

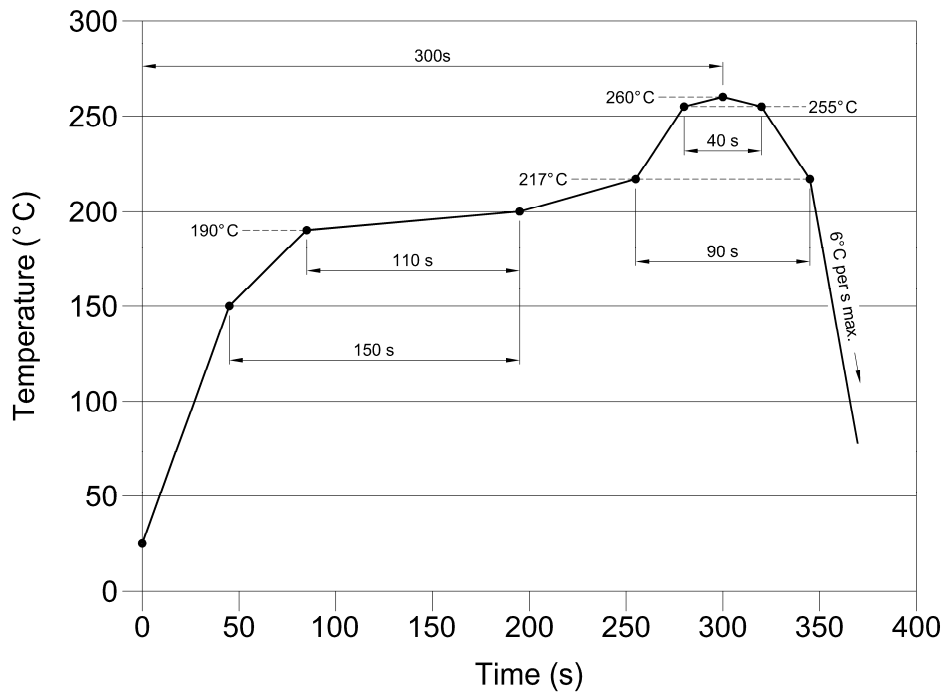
4.4. Quality Conformance Inspection

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.



Low Level Contact Resistance Measurement Points

Figure 3



Temperature Profile of Reflow Soldering

Figure 4