
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 Tyco 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

- 109-201: Component Heat Resistance to Lead-Free Reflow Soldering.
- 109-202: Component Heat Resistance to Wave Soldering.
- 501-57654: 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: -20 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.

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3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing.	Visual and dimensional inspection per product drawing.
ELECTRICAL		
Low level contact resistance.	30 mΩ max initial. 45 mΩ max final.	EIA-364-23C Subject mated contacts assembled in housing to 20 mV max open circuit at 100 mA max.
Insulation resistance.	1000 MΩ min.	EIA-364-21C After 500 VDC for 1 minute, measure the insulation resistance between the adjacent contacts of mated and unmated connector assemblies.
Dielectric withstanding voltage.	1 minute hold with no breakdown or flashover.	EIA-364-20C Method B Test between adjacent contacts of unmated connector assemblies. Voltage: 500 VAC, Current leakage: 0.5 mA max.
MECHANICAL		
Mating force.	20 N max.	EIA-364-13C Measure force necessary to mate the connector assemblies at a max of 12.5 mm/minute.
Unmating force.	4 N min.	EIA-364-13C Measure force necessary to mate the connector assemblies at a max of 12.5 mm/minute.
Durability.	See note.	EIA-364-09C Mate and unmated connector assemblies for 500 cycles at a maximum rate of 200 cycles/hour.
Retention force.	1 N min per contact.	EIA-364-29C Axial pullout force on the terminal in the housing at a rate of 25.4 mm/minute.
Mechanical shock.	No discontinuities of 1 μs or longer duration. See note.	EIA-364-27B test condition H Subject mated connectors to 30g'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.
Vibration.	No discontinuities of 1 μs or longer duration. See note.	EIA-364-28E Test Condition V Test letter A Accelerate: 5.35 g's RMS. Duration: 30 minutes in each of three mutually perpendicular planes.
ENVIRONMENTAL		
Humidity.	See note.	EIA-364-31B method II test condition A Subject mated connectors to 96 hours at 40°C with 90% to 95% RH.
Temperature life.	See note.	EIA-364-17B test condition III, method A Subject mated connectors to 85°C for 500 hours.
Thermal shock.	See note.	EIA-364-32C, test condition I Subject mated connectors to 10 cycles (half hour/cycle) between -55°C and 85°C.

Figure 1 (continued)

Test Description	Requirement	Procedure
ENVIRONMENTAL		
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.
		For DIP Solder temperature: 245 ±5°C. Solder Immersion time: 5 ±0.5 s.
		For SMT Reflow temperature: 230-245°C Reflow time: 50-70 s.
Resistance to wave soldering heat.	See note.	Tyco spec. 109-202, Condition B. Solder temp.: 265±5°C, 10±0.5 sec.
Resistance to reflow soldering heat.	See note.	Tyco spec. 109-201, Condition B Moisture soak preconditioning: 85°C and 85% RH. 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.

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	B	C	D	E	F	G
	Test Sequence (a)						
Examination of product.	1, 5	1, 9	1, 5	1, 8	1, 3	1	1, 3
Low level contact resistance.	2, 4	3, 7	2, 4				
Insulation resistance.				2, 6			
Dielectric withstanding voltage.				3, 7			
Mating force.		2					
Unmating force.		8					
Durability.	3(b)	4(b)					
Retention force.						3	
Mechanical shock.		6					
Vibration.		5					
Humidity.				5			
Temperature life.			3				
Thermal shock.				4			
Solderability.					2		
Resistance to wave soldering heat.							2
Resistance to reflow soldering heat.						2	

NOTE (a) Numbers indicate sequence in which test are performed.
 (b) Preconditioning, 20 cycles for the 50-durability cycles requirement, 50 cycles for the 500-durability cycles requirement. The insertion and removal cycle is at the maximum rate of 200 cycles per hours.

Figure 2