

Slimline SATA Plus Connector
1. SCOPE
1.1. CONTENTS

This specification covers the performance, tests and quality requirements for the Slimline SATA plus connector consisting of 7 signal contacts of 1.27mm pitch, 6 power contacts of 1.00mm pitch, and 18 plus contacts of 0.8mm pitch.

1.2. QUALIFICATION

When tests are performed on the subject product line, the procedures specified in Tyco Electronics 109 series specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENT

The following Tyco Electronics 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 SPECIFICATIONS

- A.109-5000: Test Specification, General Requirement for Test Method.
- B.109-201: Component Heat Resistance to Lead-Free Reflow Soldering.
- C.109-197: Tyco Electronics Test Specification cross reference EIA and IEC Test Methods.
- D.501-99030: Test Report

2.2. COMMERCIAL STANDARD

- A. EIA-364: Electrical connector/Socket Test Procedures Including Environmental Classifications.
- B. Serial ATA Revision 3.0

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
Housing

Material: High temperature thermoplastics , glass filled UL94 V-0 , black

Contact

Material: Copper alloy strip

Finish: Gold plating on contact area

Matte tin plating on solder area

All over nickel underplating

Retention Leg

Material: Copper alloy strip

Finish: Matte tin plating all over nickel underplating.

Tine plate

Material: High temperature thermoplastics, glass filled UL94 V-0, black

3.3. RATINGS
3.3.1 Rating of 7 signal contacts (1.27mm pitch)

A. Voltage: 40 V AC.

B. Current: 1.5A max per contact.

C. Temperature: -40°C to +85°C (inclusive of temperature rise)

3.3.2 Rating of 6 power contacts (1.00mm pitch)

A. Voltage: 40 V AC.

B. Current: 2.0A max per contact.

C. Temperature: -40°C to +85°C (inclusive of temperature rise)

3.3.3 Rating of 18 plus contacts (0.8mm pitch)

A. Voltage: 50 V AC.

B. Current: 1.3A max per contact.

C. Temperature: -40°C to +85°C (inclusive of temperature rise)

3.4. PERFORMANCE REQUIREMENT AND TEST DESCRIPTION

The product is designed to meet the electrical, mechanical and environmental performance requirement specified in Figure 1.

3.5. TEST REQUIREMENTS AND PROCEDURES SUMMARY

PARA	TEST ITEMS	REQUIREMENTS	PROCEDURES
3.5.1	Examination of Product	Meet requirements of product drawing.	EIA-364-18. Visually, dimensionally and functionally inspected per applicable inspection plan
ELECTRICAL REQUIREMENTS			
3.5.2	Insulation Resistance	(1) 7signal and 6 power contacts: 1000 MΩ min (2) 18 plus contacts: 500 MΩ min (Unmated) 50 MΩ min (Mated)	EIA-364-21 Subject a voltage of 500V DC for 1 minute between adjacent contacts.

PARA	TEST ITEMS	REQUIREMENTS	PROCEDURES
3.5.3	Dielectric withstanding Voltage	7signal and 6 power contacts: No breakdown or flashover	EIA-364-20 Method B. Subject a voltage of 500V AC for 1 minute between adjacent contacts
		18 plus contacts : No creeping discharge nor flashover shall occur. Current leakage : 0.5 mA Max.	EIA-364-20 300 VAC for 1 minute. Test between adjacent circuits of unmated connectors.
3.5.4	Low Level Contact Resistance	(1) 7signal and 6 power contacts: 50 mΩ max. initial, ΔR=15mΩ max. final (2) 18 plus contacts: 55 mΩ max. initial ΔR=20mΩ max. final	EIA 364-23. Subject a voltage of 20mV max open circuit at a current of 100mA max on mated connector assemblies
MECHANICAL REQUIREMENTS			
3.5.5	Temperature Rise (apply only to 12 positions)	Temperature rise above ambient shall not exceed 30 °C at any point in the connector when contact positions are powered. The ambient condition is still air at 25 °C	EIA 364-70. (1) Apply 2A DC current to P2~P6 contacts. (2) Apply 1.3A DC current to #12~ #18 contacts. Record temperature at measuring points. Refer to Figure 4
3.5.6	Solderability	Solderable area shall have a solder coverage of 95% min.	(DIP) EIA-364-52A Solder Temperature : 245°C±5°C Immersion Duration : 5+0/-0.5 seconds Flux : R- NON- active rosin base (SMT) Solder Temperature : 245°C±5°C Immersion Duration : 3±0.5 seconds Flux : Alpha 100
3.5.7	Resistance to Soldering Heat	See note (a).	Case of Manual Soldering Temperature: 380+/-5°C for 3+/- 1 second. To be no deformation by the top of iron at soldering tines.
3.5.8	Resistance to Reflow Soldering Heat	See note (a).	109-201 Condition B Test connector on PCB. Pre-Heat 150~200°C ,60 to 180 seconds. Ramp to peak: 3°C /sec maximum. Heat over 217 °C: 60 to 150 seconds Peak: 260+0/-5 °C maximum Duration: 3 cycles.

			Refer to Figure 4
PARA	TEST ITEMS	REQUIREMENTS	PROCEDURES
3.5.9	Mating Force	55N Max.	EIA 364-13. Mate connector assemblies at a rate of 12.5mm per minute
3.5.10	Unmating Force	3.5N Min. after 500cycles.	EIA 364-13. Mate connector assemblies at a rate of 12.5mm per minute.
3.5.11	Durability	See note (a).	EIA364-09 Mate and unmate connector assemblies at a rate of 25mm per minute for 500 cycles
3.5.12	Vibration (Random)	Discontinuity should not exceed 1 microsecond.	EIA 364-28, condition V Test letter A Subject mated connectors to 5.35 g's RMS. 30 minutes in each of three mutually perpendicular planes. Vibrate mated connector assemblies.
3.5.13	Physical Shock	Discontinuity should not exceed 1 microsecond.	EIA364-27, condition H. Subject mated connector assemblies at 30g`s with 1/2 sine wave (11ms) shock in x, y & z axis(total 18 shocks)
3.5.14	Reseating	See note (a).	Manually mating/unmating 3 time
ENVIRONMENTAL REQUIREMENTS			
3.5.15	Humidity	See note(a).	EIA 364-31 Method II , condition A. Subject mated connectors assemblies to 96 hours at 40°C with 90~95% relative humidity.
3.5.16	Temperature Life	See note(a).	EIA 364-17, Method A, condition III . Subject mated connector assemblies to 85°C for 500 hours.

3.5.17	Thermal Shock	See note(a).	EIA364-32, Condition I . Subject mated connectors assemblies to 10 cycles between -55°C and 85°C .
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Figure 1 (End)

NOTE : (a) Shall meet visual requirements, show no physical damage, and shall meet requirements of additional tests as specified in the test sequence in Figure 2

3.6 PRODUCT QUALIFICATION AND REQUALIFICATION TEST

Test Item	Test Group						
	1	2	3	4	5	6	7
	Test Sequence (b)						
Examination of Product	1, 5	1, 9	1, 8	1, 8	1, 4	1, 3	1, 3
Low Level Contact Resistance	2, 4	3, 7	2, 4, 6		3		
Insulation resistance				2, 6			
Dielectric withstanding Voltage				3, 7			
Temperature Rise			7				
Solderability						2	
Resistance to Soldering Heat							2
Resistance to Reflow Soldering Heat					2		
mating Force		2					
Unmating Force		8					
Durability	3	4(c)					
Vibration (Random)		5					
Physical shock		6					
Reseating (manually plug/unplug 3 time)			5				
Humidity				5			
Temperature Life			3				
Thermal Shock				4			

Figure 2

NOTE : (b) Numbers indicate sequence in which tests are performed.

**(c) Preconditioning, 50 cycles for the 500-durability cycle requirement.
The mating and Unmating Cycle is at the maximum rate of 200cycles per hour.**

3.7 CONTACT RESISTANCE MEASURING POINTS

Terminating wire Resistance must be subtracted from measured result reading

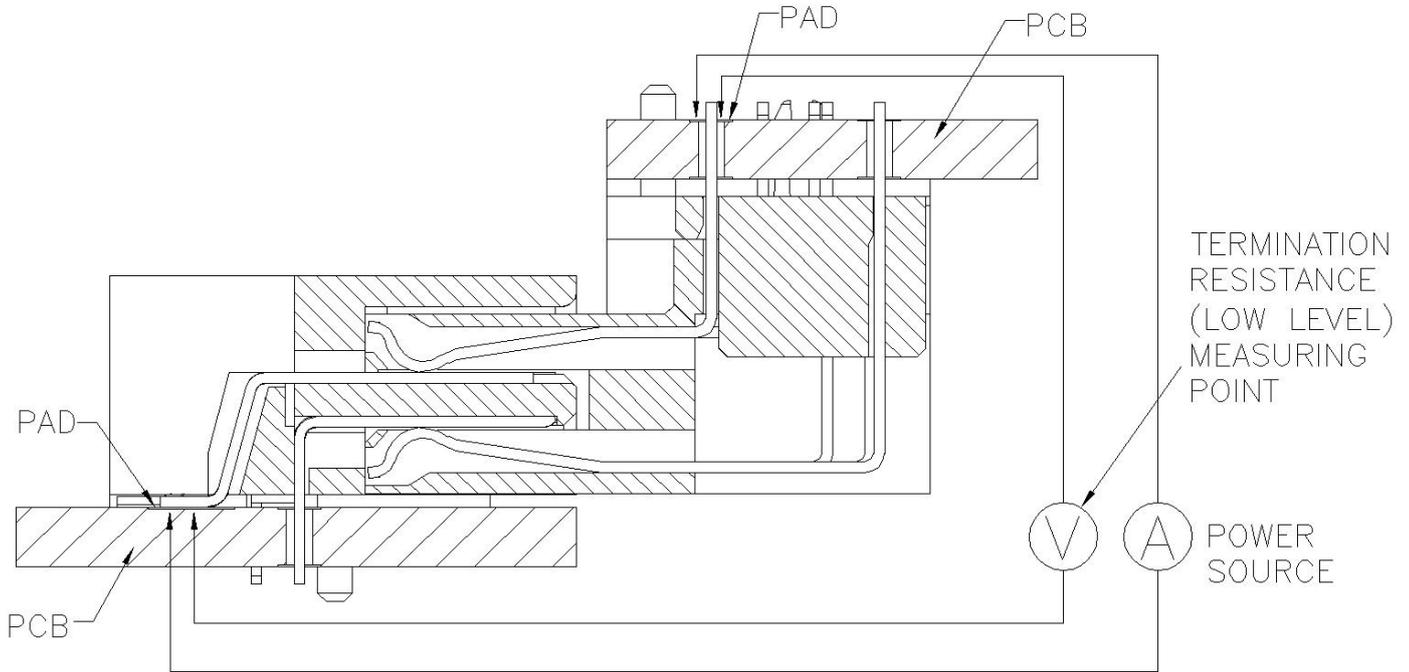


Figure 3

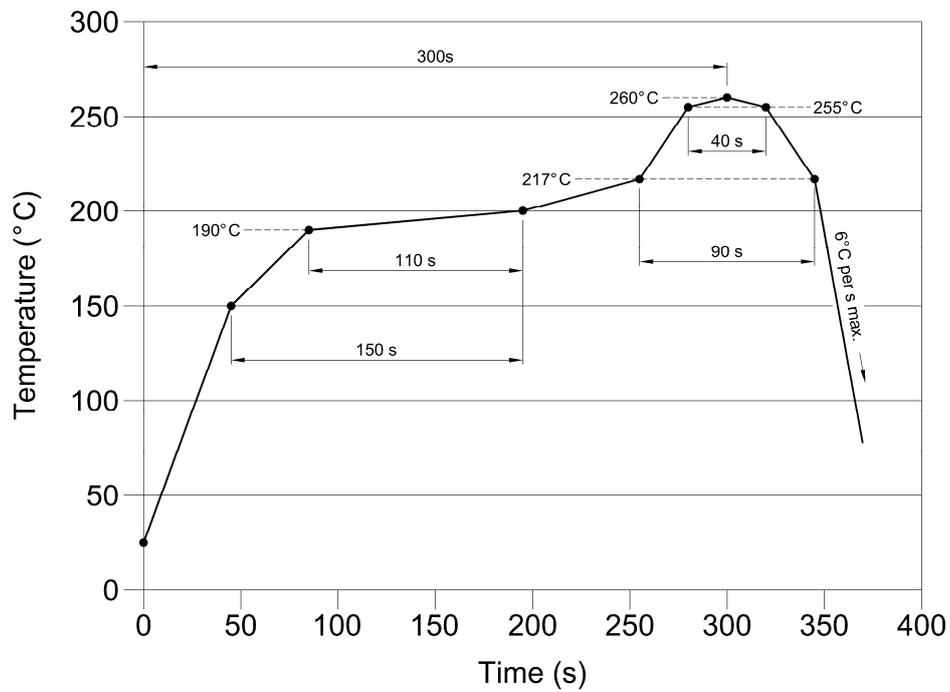


Figure 4 Temperature profile of reflow soldering