Low Profile Slim SAS Connector

1. SCOPE

1.1. Content

This specification defines performance, test and quality requirements for the Low Profile Slim SAS Connectors.

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 AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- 114-60031: Application Specification
- 501-160075: Qualification Test Report

2.2. Industry Documents

- EIA-364 Electrical Connector/Socket Test Procedures Including Environmental Classifications
- EIA-638 Surface Mount Solderability

2.3. Reference Document

- 109-197 Test Specification (TE Test Specification vs EIA and IEC Test Methods)

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction, materials and physical dimensions specified on the applicable product drawing.

3.2. Ratings

Voltage	Current	Temperature
30 VDC	0.5A per pin	-55 to 85°C

| Indicates Change

3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

Test Description	Requirement	Procedure
Visual & Dimensional inspection	Meets requirements of product drawing.	EIA-364-18. Visual examination and dimensional (C of C) inspection per product drawing.
Final examination of product	Meets visual requirements.	EIA-364-18. Visual examination.
ELECTRICAL		
Low Level Contact Resistance (LLCR)	ΔR 10 mΩ maximum	EIA-364-23. Max. open voltage 20mV. Max current 100 mA DC. Measure a minimum of 40 contacts, half from each connector side.
Insulation resistance	1000 MΩ minimum	EIA-364-21. Test voltage 100V DC. Duration: 1 minute. Measure between adjacent signal contacts.
Dielectric Withstanding Voltage	No breakdown or flashover.	EIA-364-20, Condition I. Test voltage: 300 volts AC at sea level. Test between adjacent contacts, signal to signal and signal to ground
MECHANICAL		
Random vibration	No discontinuity ≥ 1 microsecond See Note.	EIA-364-28, Test Condition VII, Test Condition Letter D. Subject mated specimens to 3.10 G RMS between 20 to 500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes.
Mechanical shock	Contact discontinuity 1 microsecond maximum See Note.	EIA-364-27, Test Condition A. Subject mated specimens to 50 Gs half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Durability (Preconditioning)	See Note.	EIA-364-9. Mate and unmate specimens. Operation cycles: 50.
Durability	See Note.	EIA-364-9. Mate and unmate specimens. Cycle rate: 500±50 per hours Operation cycles: 250.
Mating Force	40N Max. For X4/X8 67N Max. For X16	EIA-364-13 Axial Tension/ Compression machine such as an Instron Tensile Tester. Max rate 25.4mm/ Min.
Un-Mating Force	1.5N Min. For X4 3N Min. For X8 5N Min. For X16	EIA-364-13 Axial Tension/ Compression machine such as an Instron Tensile Tester. Max rate 25.4mm/ Min.
Active Latch Retention Strength	50 N minimum	EIA-364-13 Rate: 25.4 mm/minute

Figure 1 Cont.

Test Description	Requirement	Procedure
ENVIRONMENTAL		
Solderability	95% minimum wetting	IPC/ECA J-STD-002, Test S1 Preheat: 150° to180°C / 60-120 seconds Reflow: 230° to 260°C / 30-60 seconds
Resistance to reflow soldering heat	See Note.	TEC-109-201 Method-A, Condition-B. Subject SMD connector to 3x reflow curve 260°C peak.
Thermal shock.	See Note.	EIA-364-32, Method A, Test Condition VII. Subject mated specimens to 5 cycles between -55° and 105°C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures.
Humidity/temperature cycling.	See Note.	EIA-364-31, Method IV. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH.
Temperature life	See Note.	EIA-364-17, Method A, Test Subject mated specimens to 105°C for 1000 hours.
Mixed flowing gas.	No evidence of physical damage	EIA-364-65, Class IIA (4 gas). Subject board mounted specimens to environmental Class IIA for 14 days. One-half of the specimens (receptacle only) unmated for 7 days followed by 7 days mated. The remaining one-half of the specimens mated for 14 days.
Thermal cycling	See Note.	EIA-364-110, Condition A. Subject mated and board mounted specimens to 10 temperature cycles between 15 ±3°C and 85 ±3°C as measured on the specimen. Ramp times > 2°C per minute with dwell times long enough to ensure contacts reach the temperature extremes (5 minutes minimum). Humidity not controlled.
Minute disturbance	No evidence of physical damage.	Manually unmate/mate the connector 5 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

3.4. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)						
	1	2	3	4	5	6	7
	Test Sequence (b)						
Initial examination of product	1	1	1	1	1	1	1
Low Level Contact Resistance	4,6,10	4,7	3,6,9				
Insulation resistance				2,6			
Withstanding voltage				3,7			
Random vibration	7						
Mechanical shock	8						
Durability (Preconditioning)			2				
Durability	5						
Connector Mating Force	3	3					
Connector Un-Mating Force	11	8					
Active Latch Retention Strength					2		
Connector solderability						2	
Resistance to reflow soldering heat							2
Thermal shock				4			
Humidity/temperature cycling				5			
Temperature life		5					
Mixed flowing gas			4				
Thermal cycling			7				
Minute disturbance	2,9	2,6	5,8				
Final examination of product	12	9	10	8	3	3	3

NOTE

(a) Samples shall be prepared in accordance with applicable instructions and shall be selected at random from current production. Unless otherwise stated all test groups shall consist of a minimum of 5 connectors of which all contacts shall be tested.

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