PRODUCT SPECIFICATION

TITLE

SERIAL ATA BACKPLANE CONNECTOR / 1.27mm PITCH

1.0 SCOPE

This Product Specification covers the mechanical, electrical and environmental performances requirements and test methods for Serial-ATA connector series products.

2.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

The following documents form a part of this specification to the extent specified herewith. In the event of conflict between the requirements of the specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of the specification and the referenced documents, this specification shall take precedence.

2.1 EIA 364 Test Methods for Electronic and Electrical Component Parts
2.2 SERIAL ATA / High Speed Serialized at Attachment Specification
2.3 The product is compliant to RoHS directive 2002/95/EC and 2000/95/EC.

3.0 MATERIAL SPECIFICATIONS

3.1 DESIGN AND CONSTRUCTION

Connector shall be of the design, construction and physical dimensions specified on the applicable sales drawing.

3.2 MATERIALS

Contacts: Refer to respective Molex sales & engineering drawings
Housing: Refer to respective Molex sales & engineering drawings
Plating: Refer to respective Molex sales & engineering drawings

4.0 PERFORMANCE AND TEST DESCRIPTION

4.1 PERFORMANCE REQUIREMENT:

Connector shall be designed to meet the electrical, mechanical and environmental performances requirements specified in 5.0

4.2 VOLTAGE:

15V DC

4.3 CURRENT:

1.5A DC @25˚C

4.4 TEMPERATURE

Operating Temperature Range: -40˚C to +85˚C (Without loss function)
Storage Temperature Range: -40˚C to +100˚C (Without loss function)

4.5 SAMPLE SELECTION

Samples shall be prepared in accordance with applicable manufacturers' instructions and shall be selected at random from current production. Each test group shall provide 100 data points for a good statistical representation of the test result. For a connector with greater than 20 pins, a test group shall consist of a minimum of five connector pairs. From these connector pairs, a minimum of 20 contact pairs per mated connector shall be selected and identified. For connectors with less than 20 pins, choose the number of connectors sufficient to provide 100 data points.

5.0 TEST REQUIREMENTS AND PROCEDURES.

5.1 ELECTRICAL REQUIREMENTS

	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.1.1	Insulation Resistance	EIA 364-21 After 500 VDC for 1 minute, measure the insulation resistance between the adjacent contacts of mated and unmated connector assemblies.	1000 Mega ohms MINIMUM
5.1.2	Dielectric Withstanding Voltage	EIA 364-20 Method B Test between adjacent contacts of mated and unmated connector assemblies.	The dielectric shall withstand 500 VAC for 1 minute sea level
5.1.3	Contact Resistance (LLCR)	EIA 364-23 Subject mated contacts assembled in housing to 20 mV maximum open circuit at 100 mA maximum.	1. Initially 30 milliohms Max. 2. Resistance increased 15 milliohms Max. after stress
5.1.4	Mated connector impedance (Signal Port)	1). Set the Time Domain Reflectometer (TDR) pulsers in differential mode with a positive going (V+) and a negative going pulse (V-). Define a reflected differential trace: Vdiff = V+ - V- 2). With the TDR connected to the risetime reference trace, verify an input risetime of 70 ps (measured 20% - 80% Vp). Filting may be used to slow the system down (see NOTE 2) 3). Connect the TDR to the sample measurement traces. Calibrate the instrument and system (see NOTE 3). 4). Measure and record the maximum and minimum values of the near end connector impedance.	100 ohm +/- 15%
5.1.5	Contact current rating (Power segment)	1. Mount the connector to a test PCB 2. Wire power pins P1, P2, P8 and P9 in parallel for power 3. Wire ground pins P4, P5, P6, P10 and P12 in parallel for return 4. Supply 6A total DC current to the power pins in parallel, returning from the parallel ground pins (P4, P5, P6, P10 and P12) 5. Record temperature rise when thermal equilibrium is reached	1.5A per pin MINIMUM. The 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.

NOTES-
1. Time domain measurement equipment allows for delay adjustment of the pulses so launch times can be synchronized. Frequency domain equipment will require the use of phase matched fixturing .The fixturing skew should be verified to be <1 ps on a TDR.
2. The system rise time is to be set via equipment filtering techniques. The filter risetime is significantly close to the stimulus risetime. Therefore the filter programmed equals the square root of ($t_{r(observed))}$ squared - ($t_{r(stimulus)}$) squared. After filtering, verify the risetime is achieved using the risetime reference traces on the PCB fixture.
3. Calibrate the system by substituting either precision 50-ohm loads or precision air lines (also terminated in 50 ohm loads) for the test fixture. This places the calibration plane directly at the input interface of the test fixture.

5.2 MECHANICAL REQUIREMENTS

	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.2.1	Visual and dimensional inspections	EIA 364-18 Visual, dimensional and functional per applicable quality inspection plan.	Meet product drawing requirements.
5.2.2	Insertion force	EIA 364-13 Measure the force necessary to mate the connector assemblies at a max. rate of 12.5 mm(0.492") per minute.	20 N MAXIMUM
5.2.3	Removal force	EIA 364-13 Measure the force necessary to unmate the connector assemblies at maximun rate of 12.5 mm(0.492") per miniute.	4 N MINMUN through 500 cycles
5.2.4	Durability	EIA 364-09 50 cycles for internal cabled application; 500 cycles for backplane/blindmate application. Test done at a Maximum rate of 200 cycles per hour.	No physical damage. Meet requirements of additional tests as specified in the test sequence

5.4 SOLDERING CONDITION

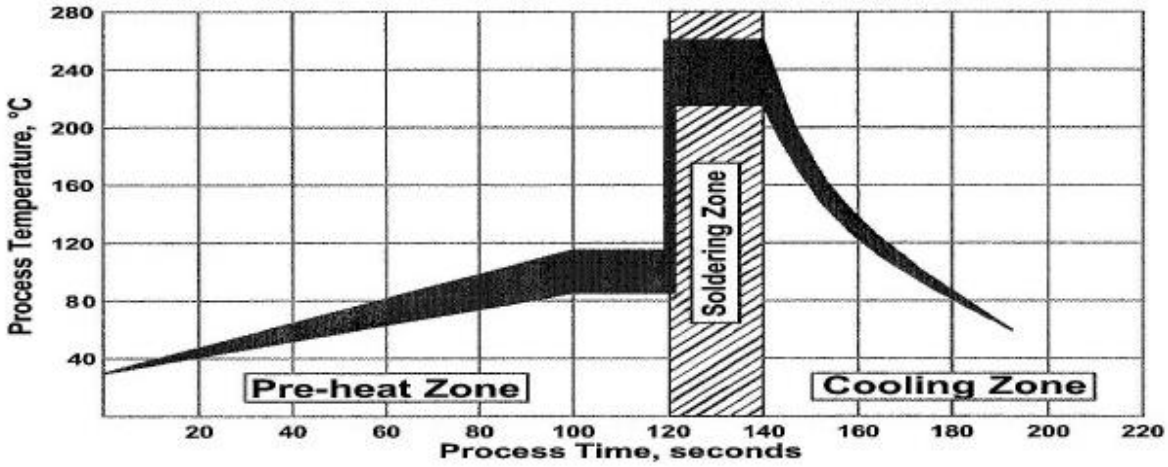
5.3 ENVIRONMENTAL REQUIREMENTS

	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.3.1	Physical shock	EIA 364-27 Condition H Subject mated connector to 30 g's half-sine shock pulses of 11 msec duration. Three shocks in each direction applied along three mutually perpendicular planes for a total 18 shocks. See NOTE 2.	No discontinuities of 1 ms or longer duration. No physical damage.
5.3.2	Random vibration	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. See Note 2.	No discontinuities of 1 μs or longer duration.
5.3.3	Humidity	EIA 364-31 Method II Test Condition A. Subject mated connectors to 96 hours at 40^{O} C with 90% to 95% RH	See NOTE 1
5.3.4	Temperature life	EIA 364-17 Test Condition III Method A. Subject mated connectors to temperature life at +85^{O} C for 500 hours.	See NOTE 1
5.3.5	Thermal shock	EIA 364-32 Test Condition I. Subject mated connectors to 10 cycles between -55^{O} C and +85^{O} C.	See NOTE 1
5.3.6	Mixed Flowing Gas(only adapt to product of gold plating 0.38 microns minimum)	EIA 364-65,Class 2A Half of the samples are exposed unmated for seven days, then mated for remaining seven days. Other half of the samples are mated during entire testing	See NOTE 1

NOTE-
1. Shall meet EIA 364-18 Visual Examination requirements, show no physical damage, and shall meet requirements of additional tests as specified in the test sequences table.
2. Shock and vibration test fixture is to be determined by each user with connector vendors.

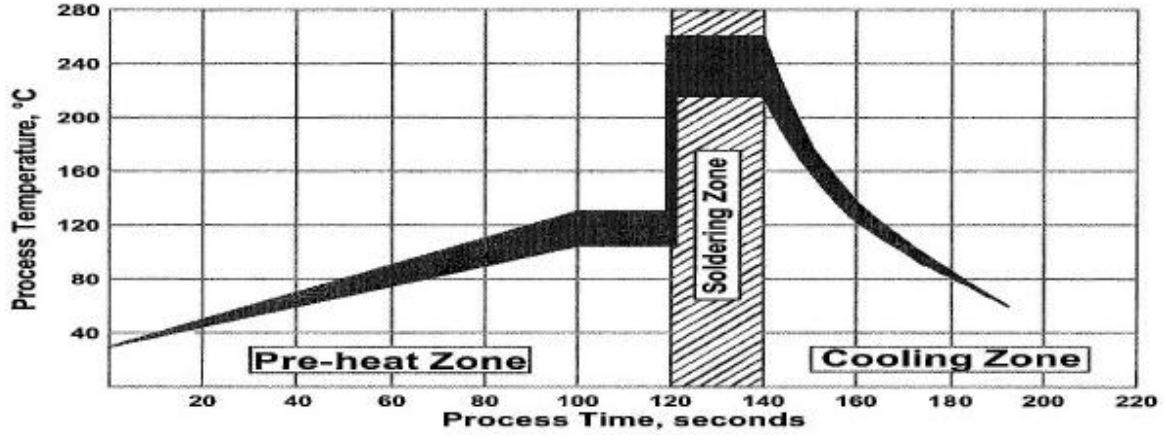
5.4.1 Wave Soldering:

Temperature Profile for Alcohol-based Flux



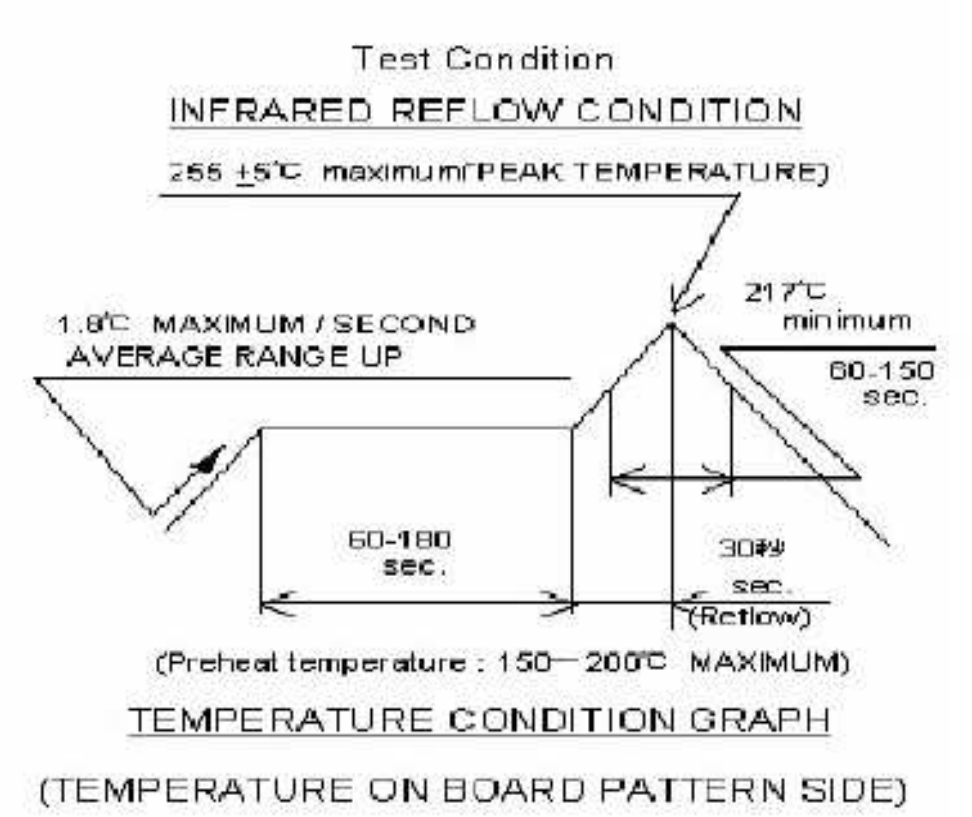
Definition	Specification, °C (°F)	Elapsed Time (seconds)
Pre-heat Temperature Target	85 – 115 (180 – 240)	20
Thermal Shock	120 (248) Typical	2
Molten Solder Contact Zone	260 (500) maximum	20

Temperature Profile for Water-based Flux



Definition	Specification, °C (°F)	Typical Time, seconds
Pre-heat Temperature Target Zone	100 – 130 (212 – 266)	20
Thermal Shock	120 (248) Typical	2
Molten Solder Contact Zone	260 (500) maximum	20

5.4.2 Recommended IR Profile (Lead Free, only for high temperature thermal plastic material):



5.4.3 Hand soldering temperature:

Peak temperature: 350˚C, less than 3 seconds.

5.5 Group Test Item

Test Sequence Groups	A	B	C	D	E
Examination of connector(s)	1,5	1,9	1,8	1,8	1,7
Low-Level Contact Resistance (LLCR)	2,4	3,7	2,4,6		4,6
Insulation resistance				2,6	
Dielectric withstanding voltage				3,7	
Current rating			7		
Insertion force		2			
Removal force		8			
Durability	3	4(a)			2(a)
Physical shock		6			
Vibration		5			
Humidity				5	
Temperature life			3		
Reseating (manually unplug/plug three times)			5		5
Mixed Flowing Gas					3
Thermal shock				4	

NOTE -
(a) Preconditioning, 20 cycles for the 50-durability cycle requirement, 50 cycles for the 500-durability cycle requirement.
(b) The insertion and removal cycle is at the Maximum rate of 200 cycles per hour.

6.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage.

7.0 OTHER INFORMATION