

1. SCOPE

This specification covers performance, tests and quality requirements for Serial ATA connector.

2. APPLICABLE DOCUMENT

The following documents form a part of this specification to the extent specified herein. 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.

Test Report: 501-5639

EIA-364 Standard

MIL-STD-202

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

A. Housing: Thermoplastic High Temp., UL94V-0

B. Contact: Phosphor Bronze

Gold plating on contact area.

Tin matte plating on soldertails.

Nickel underplated all over.

C. Pin: Brass

Tin plating all over.

Nickel underplated all over.

3.3. RATINGS

A. Current rating: 1.5 A per contact

B. Voltage rating: 250VAC

C. Operating temperature: -55°C to 85°C

3.4. TEST CONDITION

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

3.5. TEST REQUIREMENTS AND PROCEDURES SUMMARY

TEST DESCRIPTION	REQUIREMENT	PROCEDURES
Examination of product	Meets requirement of product drawing and specification.	Visual inspection No physical damage
ELECTRICAL		
Termination resistance (Low lever)	Initial: 60mΩ MAX. Final: ΔR=25 mΩ MAX.	EIA 364-23 Subject mated contacts assembled in housing to 20 mV maximum open circuit at 100 mA maximum. Refer to figure 3.
Insulation resistance	1000 MΩ MIN.	After 500 VDC for 1 minute, measure the insulation resistance between the adjacent contacts of mated and unmated connector assemblies.
Dielectric withstanding voltage	The dielectric shall withstand 500 VAC for minute at sea level. Leakage current shall not exceed 0.5mA.	EIA 364-20 Method B Test between adjacent contacts of mated and unmated connector assemblies.
Contact current rating (Power segment)	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.	<ul style="list-style-type: none"> • Mount the connector to a test PCB. • Wire power pins P1, P2, P8, and P9 in parallel for power. • Wire ground pins P4, P5, P6, P10, and P12 in parallel for return. • Supply 6 A total DC current to the power pins in parallel, returning from the parallel ground pins (P4, P5, P6, P10, and P12). • Record temperature rise when thermal equilibrium is reached.

Figure 1 (cont.)

TEST DESCRIPTION	REQUIREMENT	PROCEDURES
MECHANICAL		
Vibration (Random)	No discontinuities of 1 μ s longer duration.	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.. Load: 100 mA
Insertion force	20 N MAX.	EIA-364-13 Measure the force necessary to mate the connector assemblies at a max. rate of 12.5mm per minute.
Removal force	2 N MIN.	EIA-364-13 Measure the force necessary to unmate the connector assemblies at a max. rate of 12.5mm per minute.
Durability	No physical damage. Meet requirements of additional tests as specified in the test sequence in figure 5.	EIA 364-09 500 cycles Test done at a maximum rate of 200 cycles per hour.
Physical shock	No discontinuities of 1 μ s or longer duration. No physical damage.	EIA 364-27 Condition H Subject mated connectors to 30 g' s halfsine shock pulses of 11 msec duration. Three shocks in each direction applied along three mutually perpendicular planes for a total of 18 shocks.
Solderability and Flux test	Wet solder coverage: 95% MIN. The flux must not rise at contact point.	Flow soldering Temperature: 230 \pm 5 $^{\circ}$ C Time: 5 \pm 1sec. Flux: alpha 100
Durability of alignment free mechanism	See NOTE 1	Vertical direction displacement \pm 0.5mm 10000 cycles. Refer to figure 4.

Figure 1 (cont.)

TEST DESCRIPTION	REQUIREMENT	PROCEDURES
ENVIRONMENTAL		
Humidity	See NOTE 1	EIA 364-31 Method II Test Condition A. Subject mated connectors to humidity at $40 \pm 2^\circ\text{C}$ with 90% to 95% R.H. for 96 hours.
Temperature life	See NOTE 1	EIA 364-17 Test Condition III Method A. Subject mated connectors to temperature life at $+85 \pm 2^\circ\text{C}$ for 500 hours.
Thermal shock	See NOTE 1	EIA 364-32 Test Condition I. Subject mated connectors to 10 cycles between -55°C and $+85^\circ\text{C}$. See Table 1.
Industrial gas (SO ₂)	See NOTE 1	Subject mated connectors to SO ₂ gas 10 ppm, $25 \pm 2^\circ\text{C}$, 90~95% R.H. for 24 Hrs.
Resistance to soldering heat	No physical damage.	Test connector mounted on PCB. <ul style="list-style-type: none"> ▪ Flow soldering Temperature: $260 \pm 3^\circ\text{C}$ Time: $10 \pm 2\text{sec}$. ▪ Manual soldering Temperature: $350 \pm 10^\circ\text{C}$ Time: $3 \pm 1\text{sec}$. Soldering times: Twice ▪ Reflow soldering Reflow times: once Pre-heat: $150 \sim 170^\circ\text{C}$ $60 \sim 120\text{sec}$. Heat: 220°CMIN. 60sec.MAX. Heat peak: 260°CMAX. Refer to figure 2.

Figure 1 (cont.)

TEST DESCRIPTION	REQUIREMENT	PROCEDURES
ENVIRONMENTAL		
Moisture resistance	See NOTE 1	MIL-STD-202 Method 106 Subject mated connectors to moisture at 25~65°C, 90~95% RH for 10 cycles.
<p>NOTE--</p> <p>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 sequence in figure 5.</p>		

Figure 1 (end.)

Table 1 Thermal Shock Step

Step	Temperature [°C]	Time [min.]	
1 cycle	1	-55 +0 -3	30
	2	25 +10 -5	5 MAX
	3	85 +3 -0	30
	4	25 +10 -5	5 MAX

(Excerpt of EIA 364-32 Test Condition I)

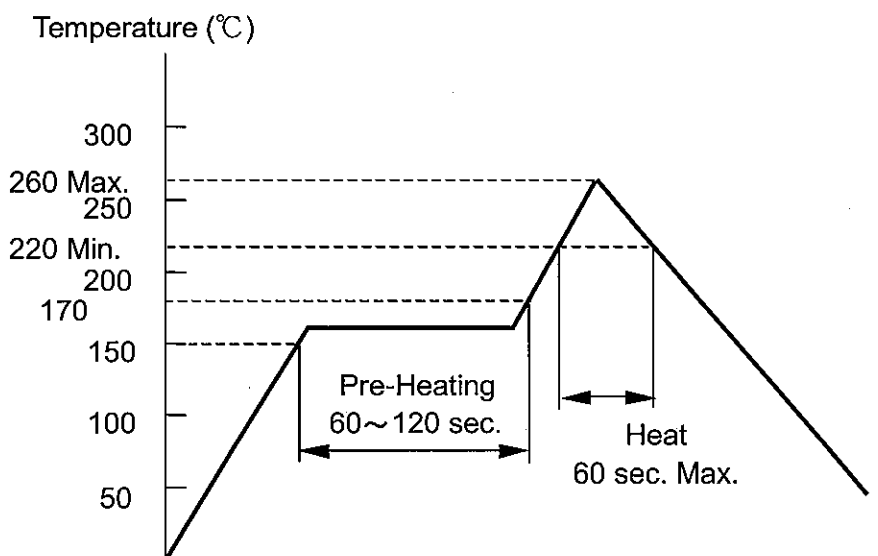


Figure 2 Reflow profile

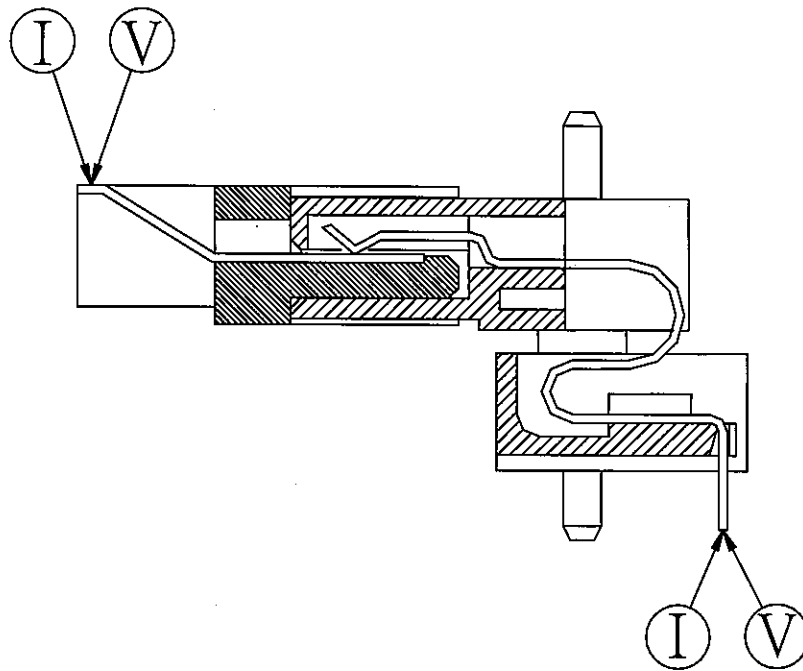
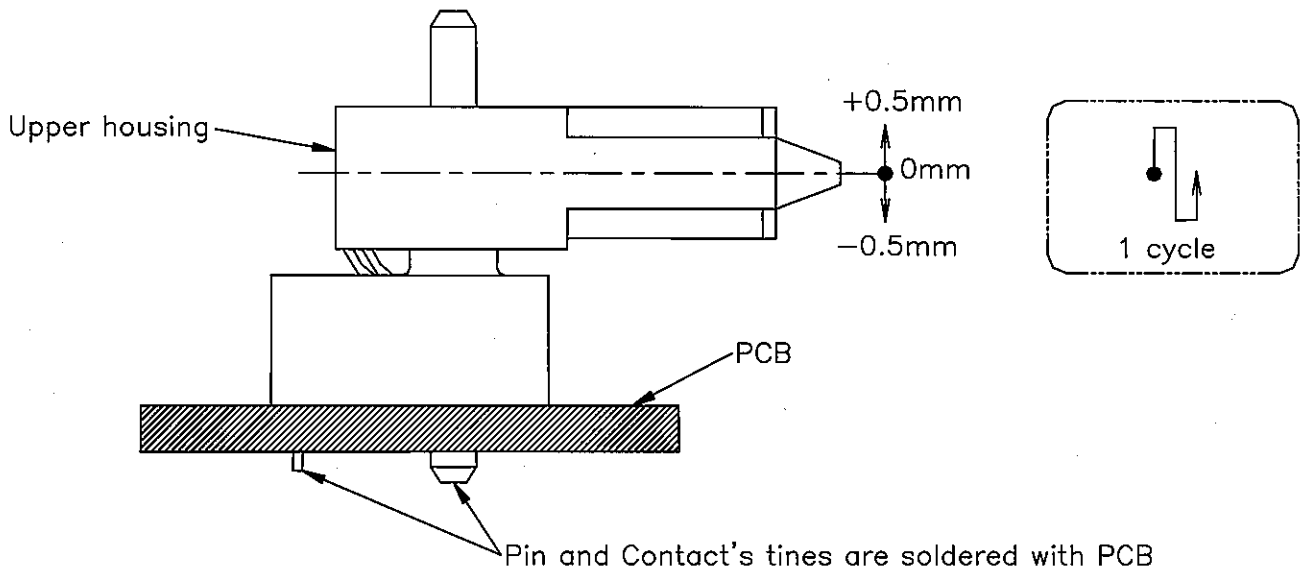


Figure 3 Termination resistance measurement point



- ① Fix test sample with PCB by soldering Pin and Contact's tine.
- ② Move Upper housing vertically $\pm 0.5\text{mm}$ 10000 cycles

- ※ Test should be performed with keeping Upper housing horizontal
- ※ Operating speed is 100mm/min.

Figure 4 Test method of Durability of alignment free mechanism

3.6. PRODUCT QUALIFICATION AND REQUALIFICATION TEST SEQUENCE

Test of examination	Test group											
	A	B	C	D	E	F	G	H	I	J	K	L
	Test sequence ^(a)											
Examination of connector	1,5	1,11	1,3	1,7	1,8	1,6	1,6	1,3	1,3	1,5	1,5	1,7
Termination resistance (Low level)	2,4	2,10		2,4,6		2,5	2,5			2,4	2,4	
Insulation resistance					2,6							2,5
Dielectric withstanding voltage					3,7							3,6
Current rating			2									
Insertion force		3,6										
Removal force		4,7										
Durability	3	5 (b)										
Physical shock		9										
Solderability and flux test								2				
Vibration		8										
Durability of alignment free mechanism											3	
Humidity					5	4						
Temperature life				3								
Reseating (manually unmate/mate three times)				5			4					
Industrial gas							3					
Thermal shock					4	3						
Resistance to soldering heat									2			
Moisture resistance										3		4

NOTE-

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

(b) Preconditioning, 50 cycles. The insertion and removal cycle is at the maximum rate of 200 cycles per hour.

Figure 5