USB / External Serial ATA Connector, 2 in 1 Type

1. SCOPE

1.1. Contents

This specification covers the performance, tests and quality requirements for the TE USB / External Serial ATA Connector, 2 in 1 Type.

1.2. Qualification

When tests are performed on the subject product line, the 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 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. TE Electronics Documents

- 109-1: General Requirements for Test Specifications
- 109-197：Test Specification（AMP test Specifications vs EIA and IEC Test Methods）
- TEC-109-201: Component Heat Resistance to Lead-Free Reflow Soldering.
- 501-118006：Test Report （Part numbers are as shown in Appendix. 1)

2.2. Industry 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 product shall be as specified on the applicable product drawing.

3.3. Ratings

- Voltage：USB: 30 VAC rms, ESATA: 10 VAC rms.
- Current：USB: 1.5A Max per contact, ESATA: 0.1A Max per contact.
- Temperature：- 40℃ to 85℃

3.4. Performance and Test description

The 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.

3.5. Test Requirements and Procedures Summary

TEST ITEM		REQUIREMENT	PROCEDURE
1	Examination of Product	Meets requirements of product drawing. No physical damage.	Visual inspection.
ELECTRICAL REQUIREMENT			
2	Low Level Contact Resistance	30 mΩ Max. (Initial) ⊿R=15 mΩ Max. (Final)	Mated connector, Contact : EIA-364-23C Open circuit 20mV maximum, 10mA Refer to Fig.3
3	Dielectric Withstanding Voltage	No creeping discharge or flashover shall occur. Current leakage: 0.5 mA Max.	500 VAC for 1minute Test between adjacent circuits of unmated connector. EIA-364-20B, Method B, Condition II
4	Insulation Resistance	1000 MΩ Min.	Impressed voltage 500 VDC. Test between adjacent contacts of unmated connector for 2 minutes. EIA-364-21D.
5	Temperature Rising (USB only)	30℃ Max. Under loaded rating current.	USB apply 1.5 A minimum when measured at an ambient temperature of 25℃. Measure temperature rising while mated connector is energized. EIA-364-70B, Method 1
MECHANICAL REQUIREMENT			
6	Mating Force	USB: 35N (3.57kgf) Max. eSATA: 40N (4.08Kgf) Max	Operation Speed：12.5mm/min. Measure the force required to mate connector. EIA-364-13B
7	Un-mating Force	USB: 10N (1Kgf) Min eSATA: 10N (1.03Kgf) Min	Operation Speed：12.5mm/min. Measure the force required to unmate connector. EIA-364-13B

Figure 1（Continue）

TEST ITEM		REQUIREMENT	PROCEDURE
8	Durability	USB: 1500 Mating/ Unmating Cycles. eSATA: 2500 Mating / Unmating Cycles	Specimens at maximum rate of 200 cycles per hour EIA-364-09C
9	Vibration (Random)	100 mA applied. No electrical discontinuity greater than 1 μsec. shall occur.	Vibration Frequency : 50 to 2000 Hz (Random) Accelerated Velocity : 53.9 m/s2 (5.35 G),rms. Vibration Direction : In each of 3 mutually perpendicular planes Duration : 30 minute each Module board should be fixed on the connector mount board or test jig. EIA-364-28D, test condition V, test condition letter A
10	Physical Shock	No electrical discontinuity greater than 1μsec shall occur. [See Note 1]	Subject mated specimens to 294 m/s2 (30 G's) half-sine shock pulses of 11 mSec. duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. EIA-364-27B, Method H.
11	Reseating	No physical damage	No. of Cycles : 3 cycles.
12	Solderability	Wet Solder Coverage : Solder tine: Contact: 95% Min Shell: 75% Min.	Solder Temperature : 245℃±5℃ Immersion Duration : 5±0.5 seconds With Flux Alpha ROL1 JEDEC JESD22-B102D, Method 1

Figure 1（Continue）

ENVIRONMENTAL REQUIREMENT			
TEST ITEM		REQUIREMENT	PROCEDURE
13	Humidity	Insulation resistance (final) 500 MΩ Min.	Mated connector, 25 - 65℃, 80 – 98% RH 168hr. minimum (seven complete cycles.) EIA-364-31B, Method III.
13	Thermal Shock	Termination Resistance ⊿R=30 mΩ Max. (Final)	Mated connector －55 +0/-3℃ /30 min., 85 +3/-0℃ /30 min. Making this a cycle, repeat 10 cycles. EIA-364-32D, Test condition I
15	Temperature Life	Termination Resistance ⊿R=30 mΩ Max. (Final)	Mated connector. 85℃, Duration : 500 hours EIA-364-17B, Test condition C, method C.

Figure 1（End）

Note 1：Shall meet visual requirements, show no physical damage, and meet requirement of additional tests as specified in the Product Qualification and Prequalification Test Sequence shown in Figure 2.

3.6. Product Qualification and Requalification test

Test Examination	Test Group				
	A	B	C	D	E
	Test Sequence				
Examination of Product	1,9	1.10	1,8	1,8	1,3
Termination resistance	2,8	4,8	2,4,6		
Dielectric withstanding Voltage				2,7	
Insulation resistance				3,6	
Temperature-rise			7		
Vibration (Random)		6			
Physical shock		7			
Mating Force	3,6	2			
Unmating Force	4,7	9			
Durability(Repeated mate/unmate)	5	5(a)			
Reseating		3	5		
Solderbility					2
Humidity				5	
Thermal shock				4	
Temperature life (Heat Aging)			3		

Figure 2

(a) This test group eSATA durability is 150 cycles, USB durability is 1500 cycles @ maximum rate 200 cycles/hr.

"L" resistance from terminating wire must be subtracted from measured result.

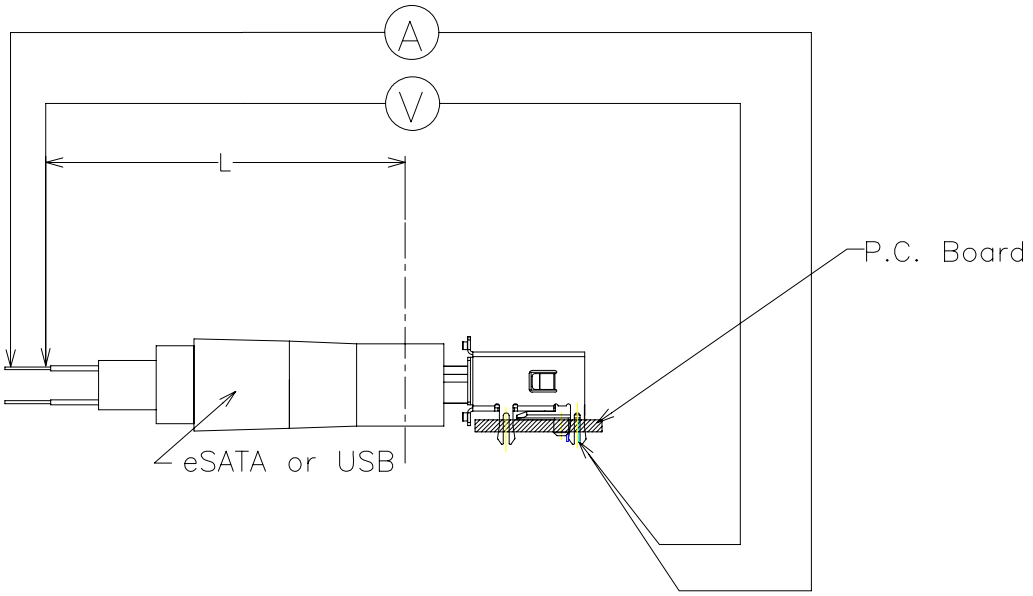

Fig.3 Contact resistance measuring points (USB AND eSATA)

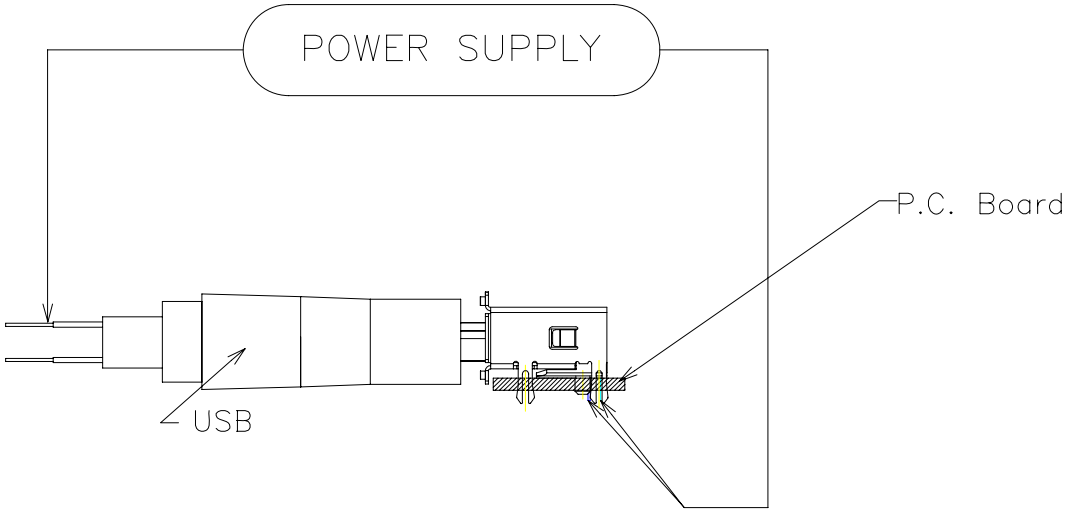

Fig.4 Temperature rising measuring points (USB)

The applicable product descriptions and part numbers are as shown in Appendix. 1.

Appendix 1

Product Part No.	Product name	Note
2129156-X	USB / External Serial ATA Connector, 2 in 1 and DIP Type, H=6.88	
1759592-X	USB / External Serial ATA Connector, 2 in 1 and DIP Type, H=8.98	
2041470-X	USB / External Serial ATA Connector, 2 in 1 and DIP Type, OFFSET	
2129160-X	USB / External Serial ATA Connector, 2 in 1 and DIP Type, OFFSET	
1759599-X	USB / External Serial ATA Connector, 2 in 1 and DIP Type, H=5.98	

B2	Add part number (1759599-X) of Appendix 1	J. Lai	S. Chien	11.JUN.12
LTR	REVISION RECORD	D.R.	CHK.	DATE