
USB CONNECTOR, A SERIES

1. SCOPE**1.1. CONTENTS**

This specification covers the performance, tests and quality requirements for the **USB CONNECTOR, A SERIES**.

1.2. QUALIFICATION

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

2. APPLICABLE DOCUMENT

The following TE 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. 109-1: General Requirements for Test Specifications
- B. 109-197 : TE Specification vs EIA and IEC Test Methods
- C. 501-57579 : Test Report
- 501-57796 : Test Report(For PN1775727-X)

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, UL94V-0
- B. Contact : Copper Alloy, Gold plating on contact area, Tin Plating on soldertail over Nickel underplating overall.
- C. Shield : Copper Alloy, Gold plating on contact area, Tin Plating on soldertail over Nickel underplating overall

3.3. RATINGS

- A. Voltage: 30 VAC rms.
- B. Current: 1.5 A Max
- C. Temperature : -40°C to 80°C

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3.4. PERFORMANCE REQUIREMENT AND TEST DESCRIPTION

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. All tests shall be performed at ambient environmental conditions per TE specification 109-1 test requirements and procedure summary.

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	Contact Resistance	30 m Ohm Max	Subject mated contacts assembled in housing to 20mV Max open circuit at 100mA Max. EIA-364-23. 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
4	Insulation Resistance	1000 M Ohm Min.	Impressed voltage 500 VDC. Test between adjacent circuits of unmated connector. EIA-364-21C
5	Temperature Rising	30°C Max. Under loaded rating current	1.5A at 250V AC minimum. When measured at an ambient temperature of 25°C. EIA 364-70 Method B.
6	Contact Capacitance	2 pF Maximum per Contact	Test between adjacent circuits of unmated connector at 1 KHz.
MECHANICAL REQUIREMENT			
7	Connector Mating Force	3.57kgf [35N] Max.	Operation Speed : 12.5 mm/min. Measure the force required to mate connector. EIA-364-13B
8	Connector Unmating Force	1.02kgf [10N] Min.	Operation Speed : 12.5 mm/min. Measure the force required to unmate connector. EIA-364-13B
9	Durability	See Note	Mate and unmated Connector assemblies for 1500 cycles at maximum rated of 200 cycles per hour. EIA-364-09
10	Vibration	No electrical discontinuity greater than 1µsec shall occur. See Note.	Subject mated connectors to 10-55-10 Hz traversed in 1minutes at 1.52mm amplitude 2 Hours each of 3 mutually perpendicular planes. 100mA Max. Applied. EIA-364-28D
11	Physical Shock	No electrical discontinuity greater than 1µsec shall occur. See Note.	Accelerate Velocity : 294m/s ² (30G) Waveform : Half-sine shock plus Duration : 11msec No. of Drops : 3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops, passing DC 100mA max. current during the test. EIA-364-27B

Figure 1 (Cont.)

MECHANICAL REQUIREMENT			
TEST ITEM		REQUIREMENT	PROCEDURE
12	Contact Retention Force	1000 gf Min.	Measure the contact retention force with Tensile strength tester.
13	Solder ability	The inspected area of each lead must have 95% solder coverage minimum.	Steam Aging Preconditioning : 1. Intended for nontin and nontin-alloy lead finishes for 93+3/-5°C 、1hrs. 2. Intended for tin and tin-alloy lead finishes for 93+3/-5°C 、8hrs. <JESD22-B102D, Condition C> Solder pot temperature: 245±5°C, 5sec
ENVIRONMENTAL REQUIREMENTS			
12	Resistance to Wave Soldering Heat	No physical damage shall occur.	Solder Temp. : 240±5°C, 10±0.5sec. TE spec. 109-202, Condition A
12	Resistance to Wave Soldering Heat	No physical damage shall occur.	Solder Temp. : 265±5°C, 10±0.5sec. TE spec. 109-202, Condition B
12	Resistance to Reflow Soldering Heat	No physical damage shall occur.	Pre Heat : 100~150°C, 60 sec Max. Heat : 210°C Min., 30 sec Max. Peak Temp. : 240°C Max., 10±0.5sec.
12	Resistance to Reflow Soldering Heat	No physical damage shall occur.	Pre-soak condition, 85°C /85% RH for 168 hours. Pre Heat : 150~180°C, 90±30sec. Heat : 230°C Min., 30±10sec. Peak Temp. : 245+0/-5°C, 10~30sec. Duration : 3 cycles TE spec. 109-201, Condition A
12	Resistance to Reflow Soldering Heat	No physical damage shall occur.	Pre-soak condition, 85°C /85% RH for 168 hours. Pre Heat : 150~180°C, 90±30sec. Heat : 230°C Min., 30±10sec. Peak Temp. : 260+0/-5°C, 20~40sec. Duration : 3 cycles TE spec. 109-201, Condition B
15	Thermal Shock	See Note	Mated Connector -55+/-3°C (30 minutes), +85+/-2°C (30 minutes) Perform this a cycle, repeat 10 cycles EIA-364-32C
16	Humidity-Temperature Cycle	See Note	Mated Connector 25~65°C , 90~95% RH, 168 Hours (seven complete cycles) EIA-364-31B.
17	Temperature Life (Heat Aging)	See Note	Mated Connector 85°C , 250 hours, EIA-364-17B.
18	Salt Spray	No detrimental corrosion allowed in contact area and base metal exposed.	Subject mated connectors to 35+/-2 °C and 5+/-1% salt condition for 48hours. After test, rinse the sample with water and recondition the room temperature for 1 hour. EIA-364-26B.

Figure 1 (End)

NOTE : Shall meet visual requirements, show no physical damage, and meet requirement of additional tests as specified in the test sequence in Figures 2

3.6. PRODUCT QUALIFICATION AND REQUALIFICATION TEST

Test or Examination	Test Group									
	A	B	C	D	E	F	G	H	I	J
	Test Sequence (a)									
Examination of Product	1, 8	1, 9	1, 6	1, 5	1, 5	1, 5	1, 5	1, 3	1, 3	1, 3
Contact Resistance		2, 8	2, 5	2, 4	2, 4	2, 4	2, 4			
Contact Capacitance	2									
Dielectric withstanding Voltage	4, 7									
Insulation Resistance	3, 6									
Temperature Rising								2		
Mating Force		3, 6								
Unmating Force		4, 7								
Durability		5								
Vibration			3							
Mechanical Shock			4							
Contact Retention Force									4	
Solderability										2
Resistance to Soldering Heat									2	
Thermal Shock				3						
Humidity Temperature Cycling	5				3					
Temperature Life						3				
Salt Spray							3			

Figure 2

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

(b) Discontinuities shall not take place in this test group, during tests.

Figure 3. Contact Resistance Measuring Point

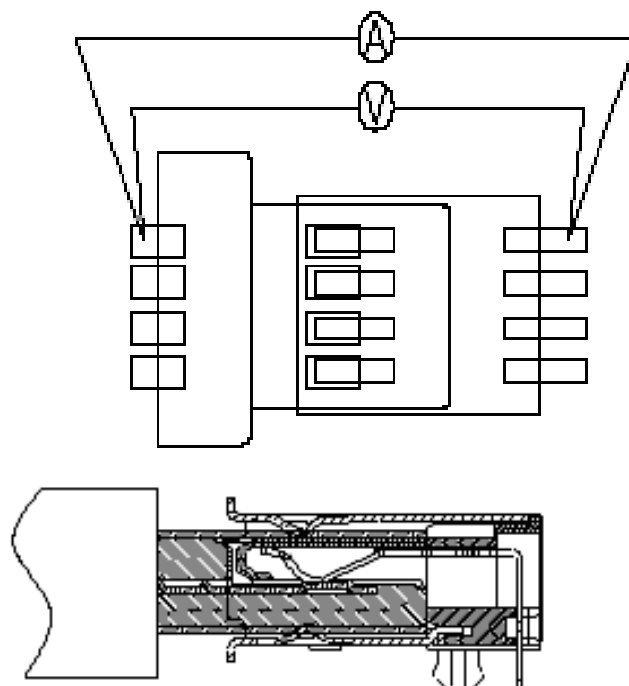


Figure 4. Resistance to reflow solder heat

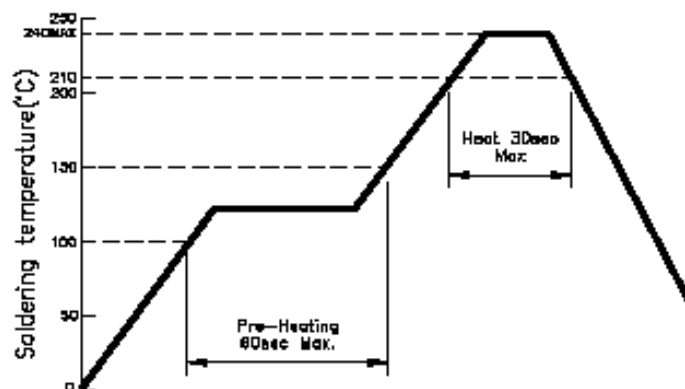


Fig.4-1 Temperature Profile of Reflow Soldering

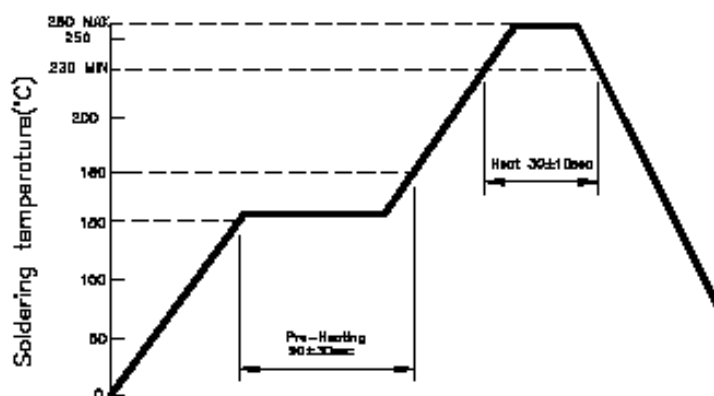


Fig.4-2 Temperature Profile of Reflow Soldering