MINI USB CONNECTOR SERIES

1. SCOPE

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

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.

2.1. TYCO SPECIFICATIONS

A. 109-1: General Requirements for Test Specifications

B. 109-197：Tyco Specification vs EIA and IEC Test Methods

C. 501-57070：Test Report

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-lead or Tin plated on soldertails, Nickel underplated all over

C. Front Shell: Copper Alloy, Nickel plated over Cu underplated all over.

D. Rear Shell: Steel, Tin plated over Nickel underplated all over.

3.3. RATINGS

A. Current Rating: 1.0 Ampere.

B. Voltage Rating: 30 VAC RMS Max.

C. Operating temperature: -40°C to +85°C

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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 ITEM	REQUIREMENTS	PROCEDURE
Examination of product	Meets requirements of product drawing and Tyco Specification.	Visual inspection No physical damage
ELECTRICAL		
Low Level Contact Resistance	1).Initial: 50 mΩ Max. 2).After test: 50 mΩ Max.	EIA 364-23 (or MIL-STD-1344A, Method 3002.1, Test Condition B) Subject mated contacts assembled in housing to 20mV maximum open circuit at 100 mA maximum
Insulation Resistance	1).Initial: 100 MΩ Min. 2).After test: 100 MΩ Min.	EIA 364-21 (or MIL-STD-202F, Method 302, Test Condition B). Test between adjacent contacts of mated and unmated connector assemblies.
Dielectric Withstanding Voltage	100 V AC for one minute at sea level 1) No flashover or insulation breakdown 2) Leakage current: 0.5mA Max.	EIA 364-20 (or MIL-STD-202F, Method 301, Test Condition B) Test between adjacent contacts of mated and unmated connector assemblies.
Contact Capacitance	2 pF Maximum per Contact	EIA 364-30 Test between adjacent circuits of unmated connector at 1 KHz.
MECHANICAL		
Contact Current Rating	1.0A at 250Vac Min.	EIA 364-70 Method B When measured at an ambient temperature of 25℃. With Power applied to the contacts, the △T shall not exceed + 30℃ at any point in the USB connector under test
Random Vibration	No discontinuity at 1 μsec or longer.	EIA 364-28 Test Condition V Test Letter A, (or MIL-STD-202F, Method 214, Test Condition 1, Test Letter A) Subject mated connectors to 5.35 G's rms. Fifteen minutes in each of three mutually perpendicular planes.
Physical Shock	No discontinuity at 1 μsec or longer.	EIA 364-27 Test Condition H (or MIL-STD-202F, Method 214B) Subject mated connectors to 30G's half-sine shock pulses of 11ms duration. Three shocks in each direction applied along three mutually perpendicular planes, 18 total shock.
Durability	No discontinuity at 1 μsec or longer.	EIA 364-09 Mate and unmate Connector assemblies for 5000cycles at maximum rated of 200 cycles per hour.

TEST ITEM	REQUIREMENTS	PROCEDURE
Connector Mating Force	3.57Kgf (35 Newtons) Max	EIA 364-13 Shall be measured with TENSION GAUGE or TENSION TESTER. Measure force necessary to mate assemblies at maximum rate of 12.5mm (or 0.492") per minute.
Connector Unmating Force	1) Initial: 0.71Kgf (7 Newtons) Min. 2) After test: 0.31Kgf (3 Newtons) Min.	EIA 364-13 Shall be measured with TENSION GAUGE or TENSION TESTER. Measure force necessary to mate assemblies at maximum rate of 12.5mm (or 0.492") per minute.
Cable Pull-out Force	Cable shall be not dislodge from cable.	EIA 364-38 Apply axial load of 40 Newtons to the cable for 1 minute. Shall be measured with TENSION GAUGE or TENSION TESTER in same direction.
ENVIRONMENTAL		
Thermal Shock	Shall meet visual requirement, show no physical damage.	EIA 364-32, Test Condition I, (or MIL-202F, Method 107G Condition A.) Subject mated connectors to five cycles between –55℃ to +85℃.
Humidity Test	Shall meet visual requirement, show no physical damage.	EIA 364-31, Test Condition A Method III, (or MIL-202F, Method 103B Test Condition B.) Subject mated connectors to 168 Hours (seven complete cycles)
Temperature Life	Shall meet visual requirement, show no physical damage.	EIA 364-17 Test Condition 3 Method A, Subject mated connectors to temperature life at 85℃ for 250hours
Solderability	The inspected area of each lead must have 95% solder coverage minimum.	Steam Aging Preconditioning： (1) Tin、Tin-Cu Coating: 93+3/-5℃、100%RH、8hrs. <J-STD-002 category 3 aging> (2) Other Coating: 93+3/-5℃、100%RH、1hrs. <J-STD-002 category 2 aging> Solder pot temperature: 245±5℃, 5sec
Resistance to Wave Soldering Heat	No physical damage shall occur.	Solder Temp.： 240℃+/-5℃,10+2/-0sec.(For PBT) 265℃+/-5℃,10+2/-0sec.(For PA9T)
Resistance to Reflow Soldering Heat	No physical damage shall occur.	Pre-soak condition, 85℃/85% RH for 168 hours. Pre Heat：150~200℃, 60~180sec. Heat：217℃ Min., 60~150sec. Peak Temp.：260+0/-5℃, 20~40sec. Duration：3 cycles Tyco spec. 109-201, Condition B

Figure1.

3.6. PRODUCT QUALIFICATION AND REQUALIFICATION TEST SEQUENCE

Test or Examination	Test Group (a)				
	A	B	C	D	E
	Test Sequence (b)				
Examination of product	1,11	1,5	1,7	1,4	1,3
Low Level Contact Resistance	3,8	2,4			
Insulation Resistance			3		
Dielectric Withstanding Voltage			4		
Contact Capacitance			2		
Contact Current Rating				2	
Random Vibration	6				
Physical Shock	7				
Durability	5				
Connector Mating Force	2,10				
Connector Unmating Force	4,9				
Thermal Shock			5		
Humidity			6		
Temperature Life		3			
Solderability				3	
Resistance to Soldering Heat					2

Figure 2

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

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