

---

**USB CONNECTOR, B SERIES.**

---

**1. SCOPE**

This specification covers performance, tests and quality requirements for **USB CONNECTOR, B 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. 501-57618 : 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. Contact: Copper Alloy, Gold plating on contact area, Tin-lead or Tin-Cu plated on soldertails, Nickel underplated all over
- B. Housing: Thermoplastic, UL94V-0.
- C. Front Shell: Copper Alloy, Nickel plated over Cu underplated all over.
- D. Rear Shell: Steel, Nickel plated over Cu underplated all over.

**3.3. RATINGS**

- A. Current Rating: 1.0 Ampere.
- B. Voltage Rating: 30 VAC RMS Max.
- C. Operating temperature: 0°C to +50°C.

---

DR	DATE	APVD	DATE
Oblic Hu	23-Jun-06	Wei-Jer Ke	23-Jun-06

---

**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	REQUIREMENT	PROCEDURE
Examination of Product	Meets requirements of product drawing. No physical damage.	Visual inspection.
<b>ELECTRICAL</b>		
Low Level Contact Resistance	1).Initial: 30 mΩ Maximum 2).After test: 30 mΩ Maximum	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 The object of this test is to detail a standard method to measure the electrical resistance across a pair of mated contacts such that the insulating films, if present, will not be broken or asperity melting will not occur.
Insulation Resistance	1).Initial: 1,000 MΩ Minimum 2).After test: 1,000 MΩ Minimum	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	500 V AC for one minute at sea level 1) No flashover or insulation breakdown 2) Leakage current: 0.5mA Maximum.	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.
Contact Current Rating	1.5A at 250Vac minimum	EIA 364-70 Method B When measured at an ambient temperature of 25°C . With Power applied to the contacts, the ΔT shall not exceed applied to the contacts, the 30°C at any point in the USB connector under test
<b>MECHANICAL</b>		
Random Vibration	1).No discontinuities of 1 μ sec or longer duration. See note (a).	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.
Physical Shock	1).No discontinuities of 1 μ sec or longer duration. See note (a).	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 shocks.

TEST ITEM	REQUIREMENT	PROCEDURE
Durability	1). Shall meet visual requirement, show no physical damage. See note (a).	EIA 364-09 Mate and unmated Connector assemblies for 1500 cycles at maximum rated of 200 cycles per hour.
Connector Mating Force	1). Initial: 35 Newtons (or 3.57Kgf) Maximum  2). After test: 35 Newtons (or 3.57Kgf) Maximum  3) After test: 18.62 Newtons (or 1.9Kgf)Maximum, for UAR2L only	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: 10 Newtons (or 1.02Kgf) Minimum Between 9.8N(1.0Kgf)~19.6N (2.0Kgf) For APPLE Only.  2). After test: 10 Newtons (or 1.02Kgf) Minimum Between 9.8N(1.0Kgf)~19.6N (2.0Kgf) For APPLE Only.	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.
<b>MECHANICAL</b>		
Contact Retention Force	1.0 Kgf min per Pin.	EIA 364-35 Shall be measured with TENSION GAUGE or TENSION TESTER in same direction.
Resistance to Bending of Cable	1). No discontinuities of 1 $\mu$ sec or longer duration. See note (a).	Each contact and wire is connected in a series. Current: 100 mA Max. Load: equivalent to 2meter-cable's weight Bending angle: $\pm 90^\circ$ Speed: 40 ~ 60 cycles/minute Cable Length: 1 Meter Bending angle: Natural R Cycles: 500 Cycles
Cable Pull-out Force	1). Cable shall be not dislodging from cable crimp.	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.
<b>ENVIRONMENTAL</b>		
Thermal Shock	1). Shall meet visual requirement, show no physical damage. See note (a).	EIA 364-32, Test Condition I, (or MIL-202F, Method 107G Condition A.) Subject mated connectors to ten cycles between $-55^\circ\text{C}$ to $+85^\circ\text{C}$ .
Humidity	1). Shall meet visual requirement, show no physical damage. See note (a).	EIA 364-31, Test Condition A Method III, (or MIL-202F, Method 103B Test Condition B.) Subject mated connectors to 96 Hours (seven complete cycles)

TEST ITEM	REQUIREMENT	PROCEDURE
Salt Spray	1). Shall meet visual requirement, show no physical damage. See note (a).	MIL-STD-202F, Method 101D, Test Condition B Subject mated connectors to 8 hours at 35 °C with 5%-Salt-solution concentration.
Temperature Life	1). Shall meet visual requirement, show no physical damage. See note (a).	EIA 364-17 Test Condition 3 Method A, Subject mated connectors to temperature life at 85°C 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°C · 100% HR · 8hrs. <J-STD-002 category 3 aging> (2) Other Coating: 93+3/-5°C · 100% HR · 1hrs. <J-STD-002 category 2 aging> Solder pot temperature: 245±5°C, 5sec
Resistance to Wave Soldering Heat	No physical damage shall occur.	Solder Temp. : 240±5°C, 10±0.5sec. Tyco spec. 109-202, Condition A
Resistance to Wave Soldering Heat	No physical damage shall occur.	Solder Temp. : 265±5°C, 10±0.5sec. Tyco spec. 109-202, Condition B
Resistance to Wave Soldering Heat	No physical damage shall occur.	Solder Temp. : 260±5°C, 10±0.5sec. Tyco spec. 109-202, Condition C
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.
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 Tyco spec. 109-201, Condition A
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 Tyco spec. 109-201, Condition B

Figure1.

Note: (a) Shall meet visual requirements, show no physical damage, and shall meet requirements of additional tests as specified in the test sequence listed in figure 2.

**3.6. PRODUCT QUALIFICATION AND REQUALIFICATION TEST SEQUENCE**

Test or Examination	Test Group									
	A	B	C	D	E	F	G	H	I	J
	Test Sequence (a)									
Examination of product	1,12	1,6	1,9	1,3	1,3	1,3	1,5	1,3	1,3	1,3
Low Level Contact Resistance	3,9	2,5					2,4			
Insulation Resistance			3,7							
Dielectric Withstanding Voltage			4,8							
Contact Capacitance			2							
Contact Current Rating				2						
Random Vibration	6	3								
Physical Shock	7	4								
Durability	5									
Connector Mating Force	2,8									
Contact Unmating Force	4,10									
Contact Retension Force						2				
Resistance to Bending of Cable									2	
Cable Retention Force	11									
Thermal Shock			5							
Humidity			6							
Salt Spray							3			
Temperature Life										2
Solderability					2					
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.