

TITLE

USB 2.0 Plug A to Mini B cable



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DOCUMENT NUMBER: PS-68768-0004	CREATED / REVISED BY: CISSY WANG	CHECKED BY: LIU LIHUA	APPROVED BY: FRED NIE

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1.0 SCOPE

This specification covers the requirements for USB A to Mini B Cable Assy.

2.0 PRODUCT DESCRIPTION

See the sales drawing for product shape; dimension and materials, the other section of this specification for the necessary referenced document and specification. The part number serial covered in this specification are as follow table:

Molex Series	Detail
173687	USB 2.0 Plug A to Mini B cable

3.0 PRODUCT SPECIFICATIONS

- 3.1 Rated voltage (Maximum): 30V DC
- 3.2 Rated current (Maximum): 1.5A for power wire
0.5A for signal wire
- 3.3 Temperature
 - Operating temperature range: 0°C to +50°C
 - Storage temperature range: -20°C to +60°C

4.0 QUALIFICATION

Laboratory conditions and sample selection are in accordance with EIA-364-1000.01

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5.0 PERFORMANCE

5.1 ELECTRICAL CHARACTERISTICS

Test Description	Test Condition	Performance Requirement
Low Level Contact Resistance (LLCR)	EIA 364-23 The low level contact resistance (LLCR) measurement is made across the plug and receptacle mated contacts and does not include any internal paddle cards or substrates of the plug or receptacle. The test boards shall be provided with the connectors to be tested. Measure at 20 mV (max) open circuit at 100 mA.	The following requirements apply to the power and signal contacts: 30mΩ(max) initial 10 mΩ maximum change for post test LLCR
Insulation Resistance	Test voltage=300±30V DC Mate/Un-mate connector, apply 300(Type A) VDC adjacent terminals or ground.(EIA-364-21)	20M ohms Min. Between adjacent contacts and contacts and shell
Dielectric Withstanding Voltage	Test voltage 100 VAC, 1 Min. (EIA-364-20)	No breakdown
Cable Assembly Voltage Drop	The maximum rated VBUS current of the cable assembly shall be used. The measurement includes representative receptacles at both ends of the cable assembly, mounted on test fixtures. 5V nominal at 500mA.	125mV max drop across power pair from pin to pin.
Capacitance	Measured between adjacent circuits of unmated connectors at 1kHz. EIA-364-30	2pF maximum
Cable Impedance	Connect the cable to test fixture, measure by TDR. Measurement configuration is on next page. Calculates by cable impedance=(2n rate +5n rate)/2	USB 2.0 spec. 1.Differential impedance (rt=200ps 10~90%) 76.5 Ohm to 103.5 Ohm 2.Com. Impedance(rt=200ps 10~90%) 21 Ohm to 39 Ohm
Attenuation	Connect connector to attenuation test fixture, measure by network Analyzer. Measurement configuration is next page.	-1.90 dB Max @ 100.0 MHz -3.20 dB Max @ 200.0 MHz -5.80 dB Max @ 400.0 MHz

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Propagation Delay	Connect the cable to test fixture, measure by TDR. Measurement configuration is next page.	26.0ns/cable max.
Propagation Delay Skew	Connect the cable to test fixture, measure by TDR. Measurement configuration is next page.	USB 2.0 spec. 100ps/ cable max

5.2 MECHANICAL CHARACTERISTICS

Test Description	Test Condition	Performance Requirement
Appearance (cable assy')	EIA 364-18 Visual, dimensional and functional inspection in accordance with the USB quality inspection plans	Must meet the minimum requirements specified by the most current version of specification.
Cable Flexing	EIA 364-41, Condition I Weight :3N Angle:120 degree Speed :20turns/minute Flexing:500cycles.	No physical damage and discontinuity over 1 microsecond during flexing shall occur to the cable assembly
Mating Force	EIA 364-13 The mating force test shall be done at a maximum rate of 12.5 mm (0.492") per minute.	35N maximum (No burrs or sharp edges are allowed on top of locking latches)
Un-mating Force	EIA 364-13 The un-mating force test shall be done at a maximum rate of 12.5 mm (0.492") per minute.	10 Newtons minimum at a maximum rate of 12.5 mm (0.492") per minute. Standard A & B series 3 Newtons minimum Mini Series.

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Cable Pull-Out	EIA 364-38 Test Condition A The cable assembly shall be subjected to a 40N axial load for a minimum of 1 minute while clamping one end of the cable plug.	No visible physical damage and no electrical discontinuity over 1 microsecond to the cable assembly.
Durability or Insertion/Extraction Cycles	EIA 364-09 Cycle rate of 500 cycles per hour if done automatically and 200 if manual cycle	Type A and B: 1,500 cycles minimum. Mini B: 5,000 cycles minimum. Conductor resistance and dielectric withstanding voltage shall be checked to be within spec after the durability cycles

5.3 ENVIRONMENTAL CHARACTERISTIC

Test Description	Test Procedure	Performance Requirement	
Temperature Life	EIA 364-17, Test Condition 4, Method A. The object of this test procedure is to detail a standard method to assess the ability of a USB connector to withstand +85° C ± 2 temperatures without applied voltage for 500 hours	Conductor resistance meets spec before and after the temperature Life test. Must be free of cosmetic and/or mechanical imperfections that will prevent normal use.	
Cyclic Temperature and Humidity	EIA 364-31 Test Condition A Method III The object of this test procedure is to detail a standard test method for the evaluation of the designs and materials used in USB connectors as the effects of high humidity and heat influences them.	168 Hours minimum (seven complete cycles). The USB connectors under test shall be tested in accordance with EIA 364-31. Conductor resistance meets spec before and after the Cyclic Temperature and Humidity test.	
Salt Spray	Mate connector and expose to the following salt mist condition. Upon completion of the exposure period, salt deposits shall be removed by a gentle wash or dip in running water, after which the specified measurements shall be performed. Nacl solution: Concentration: 5%±1%. Spray time: 24h±1h. Ambient Temperature: 35 °C ±2°C. EIA-364-26	Appearance	No Damage
		Contact Resistance	Change form initial requirement : Contact:30 milliohm Max. Shell:50 milliohm Max.

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