

PRODUCT SPECIFICATION

Title: USB Type C to USB 3.0 Legacy Cable Assy

		TITLE : USB Type C to USB 3.0 Legacy Cable Assy (NO STANDARD)	
A	Initial Release	THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO	
REV.	DESCRIPTION	MOLEX AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION	
DOCUMENT NO.		Prepared By : LUCY LI	Date : 15/03/11
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		Approved By : NIE FRED	Date : 15/03/11
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1 Scope

This specification covers the requirements for USB Type C to USB 3.0 Legacy Cable Assy

2 Product Description

USB Type C to USB 3.0 Legacy Cable Assy

See the sales drawing and the other section of this specification for the necessary. In cases where the specification differs from the drawings, the sales drawings take precedence.

3 Ratings

Voltage

Rated Voltage: 30V DC

Current

Vbus and GND, refer to sales drawing

Current of 0.25A shall be applied to all the other contacts.

4 Temperature

Operating temperature: -10 °C to +50 °C

Storage temperature: -20 °C to +60 °C

5. Pin assignment

See sales drawing

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6. Electrical And Signal Integrity Compliance Requirements

Test Description	Test Condition	Performance Requirement
Low Level Contact Resistance (LLCR)	EIA 364-23 The low level contact resistance (LLCR) measurement is made from the solder tail or cable attachment point of the receptacle to the solder tail or cable attachment point of the plug, including any internal contacts and paddle card. Measurement to use the Kelvin 4-wire method. Measure at 20 mV (max) open circuit at 100mA.	The following requirements apply to the power and signal contacts: Type C:40 mΩ (max) initial for VBUS, GND and all other contacts. USB 3.0 connector:30 mΩ maximum initial for the Power (VBUS) and Ground (GND) contacts and 50 mΩ maximum initial for all other contacts For connectors, Maximum change (delta) of +10 mΩ after environmental stresses.For cable assembly, meet test PI definition per Kelvin 4-wire method
Dielectric Withstanding Voltage	Test voltage 100 VAC, 1Min.	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.	The legacy USB cable assembly compliance requirement are governed by Sales Drawing.
USB 3.0 high performance	Refer to USB 3.0 standard	Meet high performance of USB 3.0 standard

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7. Mechanical Compliance Requirements

Test Description	Test Condition	Performance Requirement
Cable Flexing	EIA 364-41, Condition I with Dimension X = 3.7 times the cable diameter and 100 cycles in each of two planes 120 degree arc.	No physical damage and discontinuity over 1 microsecond during flexing shall occur to the cable assembly
Cable Pull-Out	EIA 364-38 Test Condition A The cable assembly shall is 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.
4-Axes Continuity	See Appendix D for detailed test fixtures and procedures. Plug and Receptacle: Subject the mating interface to the moments defined in Appendix D for at least 10 seconds.	No discontinuities greater than 1 microsecond duration in any of the four orientations tested.
Insertion Force	EIA 364-13 The insertion force test shall be done at a maximum rate of 12.5 mm (0.492") per minute.	USB Type C: Within the range from 5 N to 20 N. This requirement does not apply to the plugs that are used for direct docking without a cable. USB 3.0 Type A and B:35 Newtons maximum
Extraction Force	EIA 364-13 The extraction force test shall be done at a maximum rate of 12.5 mm (0.492") per minute.	Within the range of 8 N to 20 N, measured after a preconditioning of five insertion/extraction cycles (i.e., the sixth extraction). After an additional twenty-five insertion/extraction cycles, the extraction force shall be measured again (i.e., the thirty-second extraction) and the extraction force shall be within: a) 33 % of the initial reading, and b) within the range of 8 N to 20 N. The extraction force shall be within the range of 6 N to 20 N after 10,000 insertion/extraction cycles. This requirement does not apply to the plugs that are used for direct docking without a cable. USB 3.0 Type A and B:10 N minimum initial and 8 N minimum after the specified insertion/extraction, or durability cycles No burs or sharp edges are allowed on top of locking latches (hook surfaces which will rub against receptacle shield).
Wrenching Strength	Perpendicular forces are applied to the plug in four directions (i.e., left, right, up, and down). A metal fixture with opening and tongue representative of a receptacle shall be used. See Appendix E. (for Type C side)	A single plug shall be used for this test. Some mechanical deformation may occur. The plug shall be mated with the continuity test fixture after the test forces have been applied to verify no damage has occurred that causes discontinuity or shorting. The Dielectric Withstanding Voltage test shall be conducted after the continuity test to verify plug compliance. A new plug is required for each of the four test directions. The plug shall disengage from the test fixture or demonstrate mechanical failure (i.e., the force applied during the test procedure peaks and drops off) when a moment of 2.0 Nm is applied to the plug in the up and down directions and a moment 3.5 Nm is applied to the plug in the left and right directions.
Durability or Insertion/Extraction Cycles	EIA 364-09 The durability test shall be done at a maximum rate of 200 cycles per hour	USB Type C:10,000 cycles minimum. USB 3.0 Standard-A, Standard-B and Powered-B series: Standard Durability Class:1500 cycles High Durability Class: 5000 cycles USB 3.0 Micro Connector Family:10,000 cycles Low level contact resistance and dielectric withstanding voltage shall be checked to be within spec after the durability cycles

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8. Environmental Compliance Requirements

Test Description	Test Procedure	Performance Requirement
Temperature Life	EIA 364-17, Method A. 105° C without applied voltage for 120 hours. 105° C without applied voltage for 72 hours when used as preconditioning. The object of this test procedure is to detail a standard method to assess the ability of a USB connector to withstand temperature.	Low level contact resistance meets spec before and after the Temperature Life test.
Cyclic Temperature and Humidity	EIA 364-31 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.	Subject samples to between 25°C±3°C at 80%±3% RH and 65°C±3°C at 50%±3% RH,Ramp times should be 0.5 hour and dwell times should be 1.0hour.Dwell times start when the temperature and humidity have stabilized within the specified levels.Perform 24 such cycles. Low level contact resistance meets spec before and after the Cyclic Temperature and Humidity test.
Salt spray	Temperature:35±2°C, Density 5% in weight. Period 24 hours. Per EIA-364-26	The sample must show no oxidation. Low level contact resistance meets spec.

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