# PRODUCTS SPECIFICATION

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| | | |
|---|---|---|
| DESCRIPTION | : | USB Connectors & Cable Ass'y |
| CUSTOMER | : | |
| COMOSS P/N | : | USB-5-F-C-X-X-XX-X-X |
| Date of Issue | : | 19-Sep-2000 |
| Version | : | 1.4 |
| Designer | : | Ben |

Approval

Customer Signature


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Subject :

Product Specification - USB V2.0 connectors.

## 1.0 General

This product specification contains the test method, the general performance and requirements for USB series connectors.

## 2.0 Series Description

| USB- | 4 | M | A | S | S | XX | T | B |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |

(1) Pin No.
- * 4: 4 pin
- * 5: 5 pin

(2) Gender:
- * M: Male/ Plug
- * F: Female/ Receptacle

(3) Connector Type :
- * A : A Type.
- * B : B Type.
- * C : Mini-B Type.
- * D : Mini-A Type.
- * E : Mini-AB Type.

(4) Versions :
- * S : Cable end soldering type.
- * C : Cable end crimping type.
- * R : PCB end right angle (DIP).
- * M : PCB end right angle (SMT).
- * V : PCB end top entry (DIP).
- * T : Upper Right Type (DIP).
- * H : Cable end soldering type, long shell.
- * E : Cable end crimping type, long shell .
- * N : Cable end short body soldering type.

(5) Deck options :
- * S : Single Deck.
- * D : Double Deck.
- * T : Triple Deck.

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(6) Contact plating :
* 05 : 5u"gold over nickel.
* 15 : 15u"gold over nickel.
Aboves are optioned by customer, but not meet to STD.
* 30 : 30u"gold over nickel.

(7) Shell Plating :
* T : Tin plated.
* N : Nickel plated.

(8) Insulator colour
* B : Black.
* W : Frost white.
* G : Grey.

3.0 Overall dimensions
See attachment (Drawings).

4.0 Electrical, Mechanical, and Environment Compliance Standards

| Item | Description | Test Procedure | Performance Requirements |
|---|---|---|---|
| 4-1 | Visual and Dimensional Inspection | EIA 364-18<br>Visual, dimensional, and functional inspection in accordance with the USB quality inspection plans. | Must meet or exceed the requirements specified by the most current version of charpter 6 of the USB spec. |
| 4-2 | Insulation Resistance | EIA 364-21<br>Test between adjacent contacts of mated & unmated connector ass'y. Applying test voltage 500VDC for 1 min. | 1000MΩ Minimum.<br>(100MΩ min. for Mini-B) |
| 4-3 | Dielectric Withstanding Voltage | EIA 364-20 method B<br>Test between adjacent contacts of mated & unmated connector ass'y. | 500 Vac for 1 min. at sea level.<br>(100Vac for Mini-B) |
| 4-4 | LLCR | EIA 364-23<br>Measure the contact resistance of specimen with a current 100mA and 20mV open citcuitmaximum. | 30 (50 for mini-B)mΩ max. when measured at 20 mV maximum open circuit at 100mA. Mated test contacts must be in a connector housing.<br>Or 10mΩ of △R |

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| 4-5 | Contact Current Rating | EIA 364-70 - Method B<br>Test for assessing the current carrying capacity | 1.5A (1A for mini-B) at 250 Vac minimum when measured at an ambient temp. 25°C. With power applied to the contacts. The △T must not exceed +30 °C at any point in the USB connector Under test |
| 4-6 | Contact Capacitance | EIA 364-30<br>Apply a 1 KHz signal to the adjacent contacts of an unmated connector | 2pF Max. |
| 4-7 | Insertion Force | EIA 364-13<br>Measure force necessary to mate connector assemblies at maximum rate of 12.5mm per minute. | 35 Newtons maximum. |
| 4-8 | Extraction Force | EIA 364-13<br>Measure force necessary to unmate connector assemblies at maximum rate of 12.5mm per minute. | 10 Newtons minimum.<br>(For Mini B Connector)<br>1. 7Newton in initial<br>2. 3Newtons after 5000cycles |
| 4-9 | Durability | EIA 364-09<br>Mate and unmate connector ass'y for 1500 cycles (5000 for mini-B) at maximum rate of 200 cycles per hour. | 1500(5000 for mini B connector) insertion/extraction cycles at a maximum rate of 200 cycles per hour |
| 4-10 | Physical Shock | EIA 364-27 Test condition H.<br>Subjected mated connector attached to a PCB to 30G peak acceleration, half sine pulse of 11 ms, three shocks applied along three mutually perpend-icular planes for a total of 18 shocks.<br>Figure as shown on USB Spec. | There shall be no discontinuities 1us or longer durcation when mated USB connectors are subjected to 5.35Gs RMS. |
| 4-11 | Random Vibration | EIA 364-28<br>Test Condition V (Test Letter A)<br>Subjected mated connector attached to a PCB to 5.35Gs RMS for 15 min. in each of three mutually perpendicular axes.<br>Figure as shown on USB Spec. | There shall be no discontinuities 1us or longer durcation when mated USB connectors are subjected to 11 ms durcation 30Gs half-sine shock pluses. |

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Subject :

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| 4-12 | Thermal Shock | EIA 364-32 Test condition I.<br>Subject mated connectors to 10 cycles between -55 °C and 85°C with 1 hr at each temp. extreme. | No physical damage. |
| 4-13 | Humidity Life | EIA 364-31<br>Subject mated connectors to 7 cycles (168 hr) between 25 °C and 65 °C at 95% relative humidity (RH) | No physical damage. |
| 4-14 | Solderability | EIA 364-52 Cat. 2 - Class 1 | Solderability area shall have a minimum coverage of 95% |
| 4-15 | Temperature Life | EIA 364-17<br>+85°C for 250 hours mated | No physical damage. |
| 4-16 | Mixed flowing gas | EIA 364-65-92<br>Class II Exposures<br>(1)Unmated for 5 days<br>(2)Mated for 10 days | No physical damage. |

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**Subject :**

**Product Specification - USB V2.0 Cable assemblies.**
**(Those tests are only for cable assemblies)**

| | | | | |
|---|---|---|---|---|
| 5-1 | Cable Pull-Out | EIA 364-38 Method A<br>Apply axial load of 40 Newtons to the cable for 1 minites | After the application of a steday state axial load 40 newtons for one minute. | |
| 5-2 | Cable Impedance(only for full/high speed) | Connect the test sample to TDR to measure maximum and minimum differential impedance. | 76.5Ω -103.5Ω | |
| 5-3 | Signal pair attenuation (only for full/high speed) | 1.connect the Network Analyzer port 1 to the input connector on the attenuation fixture.<br>2.connect the plug ofthe cable to be tested to the test fixture, leaving the other end open-circuited.<br>3.calibrate the Network Analyzer and fixture using the appropriate calibration standards over the desired the test frequency range. | Frequency (MHz) | Attenuation (Maximum) |
| | | | 0.064 | 0.08 |
| | | | 0.256 | 0.11 |
| | | | 0.512 | 0.13 |
| | | | 0.772 | 0.15 |
| | | | 1.000 | 0.20 |
| | | | 4.000 | 0.39 |
| | | | 8.000 | 0.57 |
| | | | 12.000 | 0.67 |
| | | | 24.000 | 0.95 |
| | | | 48.000 | 1.35 |
| | | | 96.000 | 1.9 |
| | | | 200.00 | 3.2 |
| | | | 400.00 | 5.8 |
| | | | *Attenuation unit : dB/Cable | |
| 5-4 | Propagation Delay | 1.Set TDR head to differential mode, and use 50Ω cable for each signal.<br>2.Connect the cable to be tested to the text fiture.<br>3.Measure the propagation delay from input of test fiture to output of opposite test feture. | Maximum one-way delay is 26ns | |
| 5-5 | Propagation Delay Skew | 1.Connect the TDR to the fixture with test sample cable, as in previous section.<br>2.Measure the difference in delay for the two conductors in the test test cable. | Maximum Skew must be less than 100ps | |
| 5-6 | Cable flex | Flexing angle : ±90°<br>Speed : 40-60 cycles/minute<br>Cycles : 500 | No loss of continuity during cycling | |