

USB Type-C ENGINEERING CHANGE NOTICE

Title: Contact Current Rating

Applied to: USB Type-C Specification Release 1.0, August 11, 2014

Brief description of the functional changes:

Change the current rating measurement method from the EIA version to a unique method specified by USB due to the more complex design of the Type-C connector not lending itself to the standard EIA methodology.
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Benefits as a result of the changes:

Provides a reasonable test method for checking Type-C connector current carrying capability.
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An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
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N/A

An analysis of the hardware implications:
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N/A

An analysis of the software implications:
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N/A

An analysis of the compliance testing implications:
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The compliance test specification already defines the testing as proposed in this ECR.
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Actual Change

(a). Section 3.8.1.3, Page 94

From Text:

3.7.7.4 Contact Current Rating (EIA 364-70, Method 2)

A current of 5.0 A shall be applied collectively to VBUS pins (i.e., pins A4, A9, B4, and B9) and 1.25 A applied to the VCONN pin (i.e., B5 of the plug connector) with the return path through the corresponding GND pins (i.e., pins A1, A12, B1, and B12). A minimum current of 0.25 A shall also be applied individually to all the other contacts. When the currents are applied to the contacts, the temperature rise shall not exceed 30 °C at any point on the USB Type-C mated plug and receptacle under test, when measured at an ambient temperature of 25 °C.

To Text:

3.7.7.4 Contact Current Rating

The current rating testing for the Type-C connector (plug and receptacle) shall be conducted per the following set up and procedures:

- A current of 5 A shall be applied collectively to VBUS pins (i.e., pins A4, A9, B4, and B9) and 1.25 A shall be applied to the VCONN pin (i.e., B5) as applicable, terminated through the corresponding GND pins (i.e., pins A1, A12, B1, and B12). A minimum current of 0.25 A shall also be applied individually to all the other contacts, as applicable. When current is applied to the contacts, the temperature of the connector pair shall be allowed to stabilize. The temperature rise of the outside shell surface of the mated pair above the VBUS and GND contacts shall not exceed 30°C above the ambient temperature. Figure 3-x provides an illustration of the measurement location.
- The measurement shall be done in still air.
- The connectors shall be oriented such that the accessible outer shell surface is on top and horizontal to the ground.
- The plug and receptacle may require modification to access solder tails or cable attachment points.
- Either thermocouple or thermo-imaging (preferred) method may be used for temperature measurement.

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- For certification, the connector manufacturer shall provide the receptacle and plug samples under test mounted on a current rating test PCB. The current rating test PCBs shall be of a 2-layer construction. Table 3-y defines the requirements for the test PCB thickness and traces. The trace length applies to each PCB (receptacle PCB and plug PCB) and is from the contact terminal to the current source tie point. Figure 3-(x+1) provides an informative partial trace illustration of the current rating test PCB.

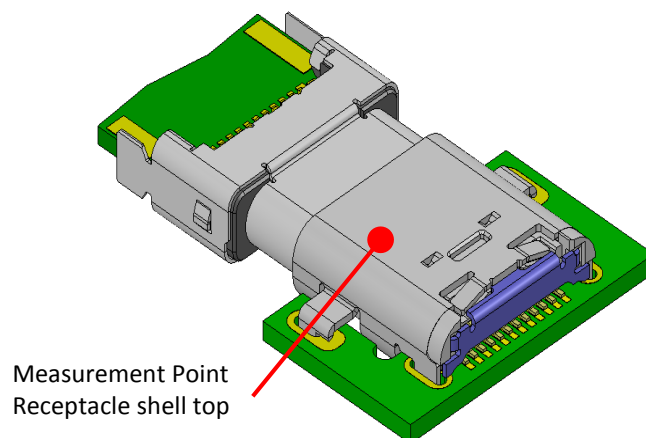


Figure 3-x Temperature Measurement Point

Table 3-y Current Rating Test PCB

Item	Trace width (mm)	Trace length (mm) on each PCB	Thickness
Signal trace	0.25 max.	13 max.	35 μm (1 oz. copper)
Ground trace	1.57 max.	38 max.	35 μm (1 oz. copper)
V_{BUS} and V_{CONN}	1.25 max.	30 max.	35 μm (1 oz. copper)
PCB	N/A	N/A	0.80 – 1.20 mm

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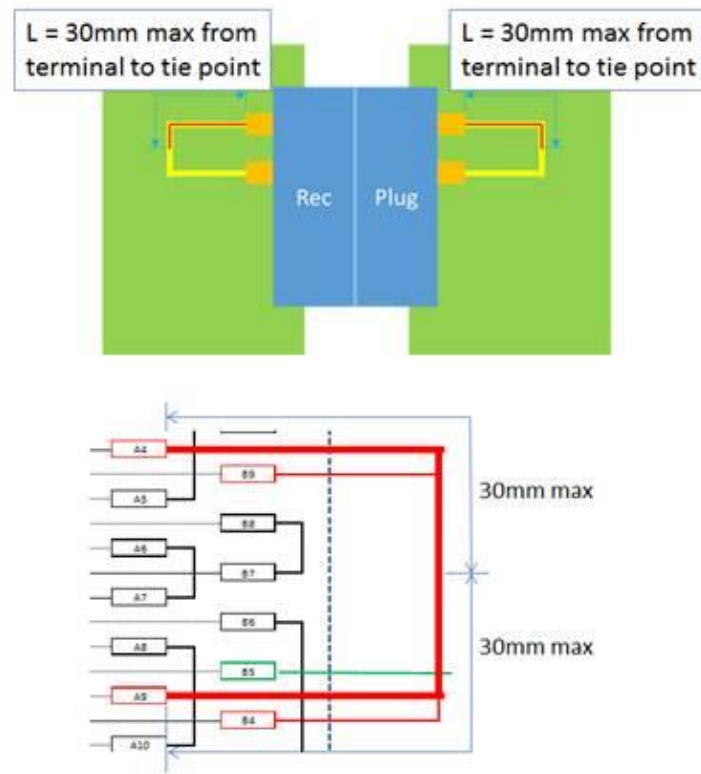


Figure 3-(x+1) Example Current Rating Test Fixture Trace Configuration