

USB Type-C ENGINEERING CHANGE NOTICE

Title: LLCR pass/fail criteria

Applied to: USB Type-C Specification Release 1.1, April 3, 2015

Brief description of the functional changes:

No functional changes. This change proposal ..

- Removes the 10 mΩ allowable change and retains the max allowable low level contact resistance (LLCR) values needed to meet functional requirements.
- Removes the paddle card from the LLCR measurement. Adds text and a revised figure specifying that the LLCR measurement applies to the mated connector pair only. Similar to bulk wire, the paddle card contributes resistance to the cable assembly. It is accounted for in cable compliance testing.

Benefits as a result of the changes:

- Reduces possibility of false test results. The existing spec calls out both max allowable LLCR values and max allowable LLCR change after test. The latter can be within measurement error.
- Simplifies certification process – there can be an infinite amount of paddle card variations. Requiring compliance testing for all plug+paddle card assemblies would be highly burdensome and redundant. Whereas a certified plug connector can be used on effectively any cable assembly.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
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None.

An analysis of the hardware implications:
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None.

An analysis of the software implications:
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None

An analysis of the compliance testing implications:
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Affects LLCR test method and the manner that LLCR data is reviewed for pass/fail.

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Actual Change

From

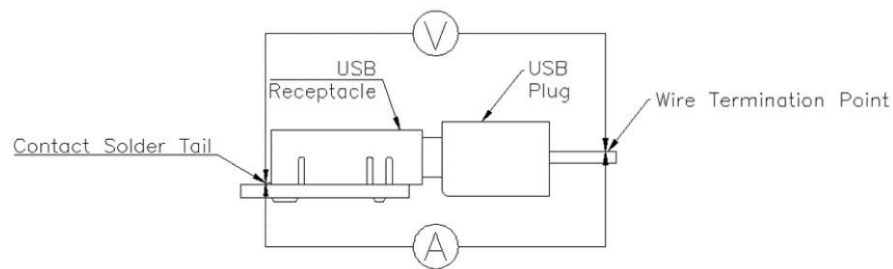
3.7.7.1 Low Level Contact Resistance (EIA 364-23B)

The low level contact resistance (LLCR) measurement is made from the solder tail of the receptacle to the soldering point of the plug (including any internal paddle cards, contacts and substrates of the plug and receptacle). See Figure 3-59. The following requirements apply to the power and signal contacts:

- 40 mΩ (Max) initial for VBUS, GND and all other contacts.
- Maximum change (delta) of +10 mΩ after environmental stresses.
- Measure at 20 mV (Max) open circuit at 100 mA.

Refer to Section 3.8 for environmental requirements and test sequences.

Figure 3-59 LLCR Measurement Diagram



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To

3.7.7.1 Low Level Contact Resistance (EIA 364-23B)

The low level contact resistance (LLCR) measurement is made across the plug and receptacle mated contacts to the soldering point of the plug (including any internal paddle cards, contacts and substrates of the plug or receptacle). See Figure 3-59. The following requirements apply to the power and signal contacts:

- 40 mΩ (Max) initial for VBUS, GND and all other contacts.
- Maximum change (delta) of +10 mΩ after environmental stresses.
- Measure at 20 mV (Max) open circuit at 100 mA.

Refer to Section 3.8 for environmental requirements and test sequences.

Figure 3-59 LLCR Measurement Diagram

