USB Type-C ENGINEERING CHANGE NOTICE

Title: Type-C Captive Cable Output Voltage
Applied to: USB Type-C Specification Release 1.1, April 3, 2015

Brief description of the functional changes:

Clarify the allowable output from a captive cable charger.

Benefits as a result of the changes:

We have not clearly defined the expected behavior of a captive cable charger. This ECR allows the power source to compensate for its cable power loss and places requirements so that power sinks have the same expectations from a captive cable charger as from one with a detachable cable.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:

.None.

An analysis of the hardware implications:

.None

An analysis of the software implications:

None.

An analysis of the compliance testing implications:

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Actual Change

(a). A.1
From:

4.8.1.2 Chargers with USB Type-C Captive Cables
- A charger with a USB Type-C captive cable may supply V_{BUS} at any time. It is recommended that such a charger only apply power to V_{BUS} when it detects a UFP is present and remove power from V_{BUS} when it detects the UFP is not present (vOPEN).

- A charger with a USB Type-C captive cable shall limit its current advertisement so as not to exceed the current capability of the cable (up to 5 A).

To:

4.8.1.2 Chargers with USB Type-C Captive Cables
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  > **Commented [DR1]:** Isn't this in conflict with a requirement that chargers with PD MUST be cold?

- A charger with a USB Type-C captive cable shall limit its current advertisement so as not to exceed the current capability of the cable (up to 5 A).

- The voltage as measured at the plug of a charger with a Type-C captive cable may be up to $0.75 \times I / 3$ V ($0 < I \leq 3A$), or $0.75 \times I / 5$ V ($0 < I \leq 5A$) lower than the standard tolerance range for the chosen voltage, where I is the actual current being drawn.
  - A charger that advertises Type-C Current (default, 1.5A and 3A) shall output a voltage in the range of 4.75V – 5.5V when no current is being drawn and between 4.0V – 5.5V at 3A. Under all loads, the output voltage shall remain within the cross hatched area shown in Figure TBD.
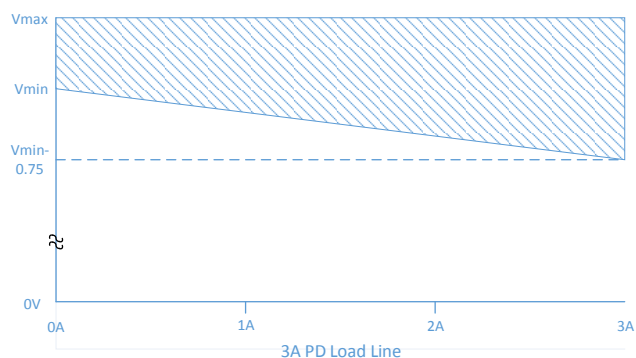
Figure TBD Non-PD Charger Type-C cable's output as a function of load
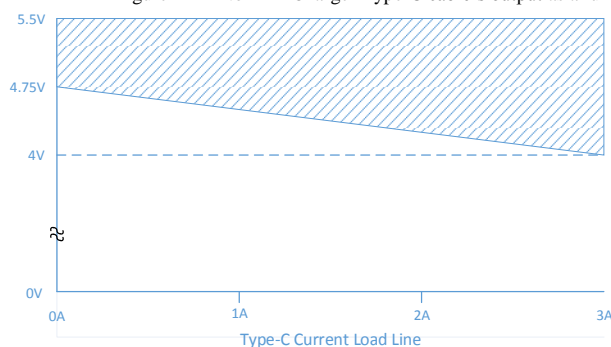
  - A PD Charger that has negotiated a voltage V at $\leq$ 3A shall output a voltage in the range of Vmax (V + 5%) and Vmin (V - 5%) when no current is being drawn and Vmax and Vmin – 0.75V at 3A. Under all loads, the output voltage shall remain within the cross hatched area shown in Figure TBD.

Figure TBD 0-3A PD Charger Type-C cable's output as a function of load

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3A PD Load Line

o A PD Charger that has negotiated a voltage V at between 3A and 5A shall output a voltage in the range of Vmax (V + 5%) and Vmin (V - 5%) when no current is being drawn and Vmax and Vmin – 0.75V at 5A. Under all loads, the output voltage shall remain within the cross hatched area shown in Figure TBD.

Figure TBD 3-5A PD Charger Type-C cable's output as a function of load

5A PD Load Line