

USB Type-C ENGINEERING CHANGE NOTICE

Title: Forbid BC 1.2 detection during USB PD
Applied to: USB Type-C Specification Release 2.0, August 2019

Brief description of the functional changes proposed:

Forbid BC 1.2 sinks from performing BC 1.2 detection while in Power Delivery Mode.

Benefits as a result of the proposed changes:

Prevents a sink's legacy BC 1.2 detection behavior from disrupting USB 2.0 data while in USB PD mode. BC 1.2 detection begins when VBUS assertion is detected, and then proceeds with data contact detection and primary detection. However, USB PD's Power Role Swap process requires VBUS to be interrupted briefly, which may be interpreted by BC 1.2 detection hardware as a detection renegotiation. This may result in an unintended USB 2.0 disconnect as the BC 1.2 detection manipulates D+ and D-. Since USB PD has higher precedence than USB BC 1.2, let's mandate that sinks do not perform BC 1.2 detection while in Power Delivery Mode.

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

No impact.

An analysis of the hardware implications:

If the sink supports USB PD and USB 2.0 data on D+ and D-, the BC 1.2 detection hardware must be carefully chosen such that it can be disabled by software while the system is in Power Delivery Mode. If the BC 1.2 hardware cannot be disabled, it is inappropriate to be used in a USB PD sink.

An analysis of the software implications:

Assuming the BC 1.2 detection logic is controllable via software, software must be modified to disable automatic BC 1.2 detection before entering a USB PD contract.

An analysis of the compliance testing implications:

Compliance testing should check that during a PR_SWAP test that a DUT's USB 2.0 connection is not reset through the PR_SWAP process, especially if the device claims that it supports BC 1.2 as well, as this is a tell tale sign that they're still running detection that is triggered on the VBUS edge.

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Actual Change Requested

(a). Section 1.5, Terms and Abbreviations

Additional Entry:

Power Delivery Mode	A mode where the Port partners are in a USB PD power contract (either Explicit or Implicit).
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(b). Section 4.6.2.2 USB Battery Charging 1.2, Page 220

Additional Text:

While in Power Delivery Mode, a device acting as a sink ***Shall Not*** initiate a USB BC 1.2 detection until the Port Pair is detached or there is an Error Recovery or a Hard Reset.