

Compare Results

Old File:

USB_PD_R3_1 V1.8 2023-04_Ch4.pdf

1 page (428 KB)

13/10/2023 19:35:28

versus

New File:

USB_PD_R3_2 V1.0 2023-10_Ch 4.pdf

2 pages (302 KB)

31/10/2023 18:08:17

Total Changes

11

Text only comparison

Content

- 7 Replacements
- 2 Insertions
- 2 Deletions

Styling and Annotations

- 0 Styling
- 0 Annotations

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4. Electrical Requirements

This chapter covers the platform's electrical requirements for implementing USB Power Delivery.

4.1 Interoperability with other USB Specifications

USB Power Delivery **May** be implemented alongside the [\[USB 2.0\]](#), [\[USB 3.2\]](#), [\[USB4\]](#), [\[USBBC 1.2\]](#) and [\[USB Type-C 2.3\]](#) (USB Type-C®) specifications. In the case where a Device requests power via the Battery Charging Specification and then the USB Power Delivery Specification, it **Shall** follow the USB Power Delivery Specification until the Port Pair is Detached or there is a Hard Reset. If the USB Power Delivery connection is lost, the Port **Shall** return to its default state, see [Section 6.8.3 “Hard Reset”](#).

4.2 Dead Battery Detection / Unpowered Port Detection

Dead Battery/Unpowered operation is when a USB Device needs to provide power to a USB Host under the circumstances where the USB Host:

- Has a Dead Battery that requires charging or
- Has lost its power source or
- Does not have a power source or
- Does not want to provide power.

Dead Battery charging operation for connections between USB Type-C® connectors is defined in [\[USB Type-C 2.3\]](#).

4.3 Cable IR Ground Drop (IR Drop)

Every PD Sink Port capable of USB communications can be susceptible to unreliable USB communication if the Voltage drop across ground falls outside of the acceptable common mode range for the USB Hi-Speed transceivers data lines due to excessive current draw. Certified USB cabling is specified such that such errors don't typically occur (See [\[USB Type-C 2.3\]](#)).

4.4 Cable Type Detection

Standard USB Type-C® cable assemblies are rated for PD Voltages higher than [vSafe5V](#) and current levels of at least 3A (See [\[USB Type-C 2.3\]](#)). The Source **Shall** limit maximum capabilities it offers so as not to exceed the capabilities of the type of cabling detected.

Sources capable of offering more than 3A **Shall** detect the type of Attached cable and limit the Capabilities they offer based on the current carrying capability of the cable determined by the Cable capabilities determined using the [Discover Identity](#) Command (see [Section 6.4.4.3.1 “Discover Identity”](#)) sent using SOP' Communication (see [Section 2.4 “SOP* Communication”](#)) to the Cable Plug. The Cable VDO returned as part of the [Discover Identity](#) Command details the maximum current and Voltage values that **Shall** be negotiated for a given cable as part of an Explicit Contract.

The cable detection process is usually run when the Source is powered up, after a Power Role Swap or Fast Role Swap or when power is applied to a Sink. The exact method used to detect these events is up to the manufacturer and **Shall** meet the following requirements:

- Sources **Shall** run the cable detection process prior to the Source sending [Source_Capabilities](#) Messages offering currents in excess of 3A and/or Voltages in excess of 20V.
- Sinks with USB Type-C® connectors **Shall** select Capabilities from the offered Source Capabilities assuming that the Source has already determined the Capabilities of the cable.

Sinks with the DRP bit set, **Shall** respond to a *Get_Source_Cap* message by declaring their full Source Capabilities, without limiting them based on the cable's capabilities.