

USB Type-C ENGINEERING CHANGE NOTICE

Title: Exit from Attached.SNK State

Applied to: USB Type-C Specification Release 1.2, March 25, 2016

Brief description of the functional changes proposed:
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The specification calls for a disconnect threshold of 3.67V or 80% for USB PD. This has some practical issues since no tolerance is specified around the threshold. Concerns have been raised regarding how well it works with legacy Sources, and it is more complicated than necessary for USB PD capable sinks. The ECN also makes allowance using CC pin for detecting disconnect.
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Benefits as a result of the proposed changes:
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More robust and clear definition for exiting Attached.SNK.
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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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None.

An analysis of the hardware implications:
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Existing hardware may be affected by this change.

An analysis of the software implications:
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N/A

An analysis of the compliance testing implications:
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Compliance testing will have to be updated.

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Actual Change Requested

(a). Section 4.5.2.2.5.2 Exiting from Attached.SNK State, Page 143

From Text:

A port that is not in the process of a *USB PD* PR_Swap or a *USB PD* Hard Reset shall transition to Unattached.SNK when VBUS falls below 3.67 V. Note if VBUS has been adjusted by *USB PD* to operate above 5 V, then the port shall transition to Unattached.SNK when VBUS falls below 80% of the negotiated value. If supplying VCONN, the port shall cease to supply it within tVCONNOFF of exiting Attached.SNK.

To Text:

A port that is not in the process of a *USB PD* PR_Swap or a *USB PD* Hard Reset **or a *USB PD* FR_Swap** shall transition to Unattached.SNK **within tSinkDisconnect** when VBUS falls below **vSinkDisconnect** for VBUS operating at **or below 5V or below vSinkDisconnectPD when negotiated** by *USB PD* to operate above 5 V. **A port that has entered into USB PD communications with the Source and has seen the CC voltage exceed vRd-USB may monitor the CC pin to detect cable disconnect in addition to monitoring VBUS. A port that is monitoring the CC voltage for disconnect (but is not in the process of a USB PD PR_Swap or USB PD FR_Swap) shall transition to Unattached.SNK within tSinkDisconnect after the CC voltage remains below vRd-USB for tPDDebounce.** If supplying VCONN, the port shall cease to supply it within tVCONNOFF of exiting Attached.SNK.

(b). Section 4.4.2 (New Table)

New Text:

	minimum	maximum	Description
tSinkDisconnect		40 ms	Time limit for transition from Attached.SNK to Unattached.SNK
vSinkDisconnect	0.8V	3.67V	Threshold used for transition from Attached.SNK to Unattached.SNK. This also applies for USB PD contracts at or below 5V. For USB PD contracts at or below 5V, the Sink shall take IR drop and margin into account when selecting this threshold.
vSinkPD_min		vNew – 750 mV + vValid	Minimum valid VBUS voltage seen by sink when negotiated through PD. vNew is either vSrcNew (min) or vPpsNew (min) as defined in USB PD. 750mV= 500mV + 250mV (maximum IR drop) vValid = vSrcValid (min) or vPpsValid (min) as defined in USB PD.
vSinkDisconnectPD	90% of vSinkPD_min	vSinkPD_min	VBUS disconnect threshold when VBUS voltage was negotiated through PD to a value above 5V