USB Power Delivery ENGINEERING CHANGE NOTICE

Title: APDO Minimum Voltage
Applied to: USB Power Delivery Specification Revision 3.0 Version 1.1

Brief description of the functional changes proposed:
Allows a minimum APDO voltage to 3.3V instead of 3.0V to allow for enough headroom above the Rd detection level of 2.6V as required for a Source advertising with an Rp for 5V/3A. A referral to the Power rules is proposed in Section 7.1.4.3, as many readers pointed out it is hard to find the actual requirement on vPpsMinVoltage.

Benefits as a result of the proposed changes:
In case of a 3V minimum the actual minimum voltage ***vPpsMinVoltage*** is allowed to be as low as 2.85V (-5%). The chance of hitting the UVLO level of the Programmable Power Supply due to voltage transients and ripple will be high in that case. A minimum of 3.3V (so, 3.135V as lowest value) will prevent this.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
New PPS sources will raise their minimum voltage to 3.3V.

An analysis of the hardware implications:

An analysis of the software implications:

An analysis of the compliance testing implications:
Compliance testing will be done with 3.3V as minimum for PPS.

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Actual Change Requested

(a). Table 10-8

From Text:

Table 10-8 Programmable Power Supply Voltage Ranges

	Fixed Nominal Voltage			
	5V Prog	**9V Prog**	**15V Prog**	**20V Prog**
Maximum Voltage	5.9V	11V	16V	21V
Minimum Voltage	3V	3V	3V	3V

To Text:

Table 10-8 Programmable Power Supply Voltage Ranges

	Fixed Nominal Voltage			
	5V Prog	**9V Prog**	**15V Prog**	**20V Prog**
Maximum Voltage	5.9V	11V	16V	21V
Minimum Voltage	3.3V	3.3V	3.3V	3.3V

(b). Section 7.1.4.3

From Text:

Figure 7-4 and Figure 7-5 below show the output voltage behavior of a Programmable Power Supply in response to positive and negative voltage change requests while operating with a PPS. The parameters ***vPpsMinVoltage*** and ***vPpsMaxVoltage*** define the lower and upper limits of the PPS range respectively. ***vPpsMinVoltage*** corresponds to Minimum Voltage field in the PPS APDO and ***vPpsMaxVoltage*** corresponds to Maximum Voltage field in the PPS APDO. If the Sink negotiates for a new PPS APDO, then the transition between the two PPS APDOs ***Shall*** occur as described in Section 7.3.18.

To Text:

Figure 7-4 and Figure 7-5 below show the output voltage behavior of a Programmable Power Supply in response to positive and negative voltage change requests while operating with a PPS. The parameters ***vPpsMinVoltage*** and ***vPpsMaxVoltage*** define the lower and upper limits of the PPS range respectively (see Table 10-8 for required ranges). ***vPpsMinVoltage*** corresponds to Minimum Voltage field in the PPS APDO and ***vPpsMaxVoltage*** corresponds to Maximum Voltage field in the PPS APDO. If the Sink negotiates for a new PPS APDO, then the transition between the two PPS APDOs ***Shall*** occur as described in Section 7.3.18.