NOPOWER & pd_undefined D2.4 v131

Info (not part of baseline)

Per D2.4 the behavior of a PD is completely undefined once V_{PD} has fallen below V_{Off_PD} when the PD has been powered. Comment #87 against D2.3 created a TDL to deal with this:

Cl **145** *SC* **145.3.8.1** *P* **184** *L* **7** # 87

Bennett, Ken — Sifos Technologies, In

Comment Type **T** *Comment Status* **A** *PD Power*

The following statement is incorrect:

"The behavior of a PD at a voltage outside of VPort_PD-2P is undefined once the PD reaches the POWER_DELAY or POWERED state, until VPD falls below VReset_PD".

Voff_PD, Voverload_PD-2P, and Vtransient_PD-2P are all examples where this is not true.

SuggestedRemedy

Remove (or revise) the sentence.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change to: "If VPD falls below Voff_PD once a PD has reached the POWER_DELAY or POWERED state."

Also, add TDL (Lennart, Dave A., Yair): Figure out how to fix the NoPower State.

.....
Notes from discussion:
There are a few issues with this sentence. The one you point out, plus do we really mean completely undefined? No, the PD must still meet the detect and class electrical parameters I assume.

Since the SD only transitions to NOPOWER based on Voff_PD, how about:

"If VPD falls below Voff_PD once a PD has reached the POWER_DELAY or POWERED state, the PD's behavior, with the exception of the electrical parameters defined in Table 145-20, Table 145-23, and Table 145-26, is undefined until VPD falls below Vreset_PD".

HS:
Undefined best means undefined. New text is limiting.

Response DNA: Yes, my point is to limit the scope of what is undefined. If it is truly undefined then a compliant PD can draw infinite current as soon as the voltage drops. We don't want that.

This baseline aims for three goals:

1. While in the NOPOWER state, there are no specific requirements on the PD (no requirements on MPS, Mark, Class, or detection signature). In this state, the PD is “off” per the requirement in 145.3.8.1.
2. When the PD voltage rises above V_{On_PD} again, all of the normal POWERED requirements are again in effect. Since this voltage dip may have caused changes to the PD class event counter, the pd_max_power variable is set to the minimum of Class 8 and the PD requested Class. This covers any possible behavior a PD may do regarding class counting.

   Also, the PD should be allowed to go through INRUSH again (since that is what many PDs will do).
3. Get rid of the concept of a PD being in an “undefined” state.

A return path from NOPOWER to INRUSH is added to transition back into defined operation. The pse_power_level variable is set to 8 in the NOPOWER state, this accounts for any class event count increase that may have happened. During NOPOWER, the pd_max_power variable is set to zero, restriction to PD to draw no more than 51mA. This is consistent with V_{Off_PD} requirements, but still allows the PD to draw mark, or class, or MPS.

145.3.3.4 Single-signature PD variables

Remove the pd_undefined variable.

pd_max_power

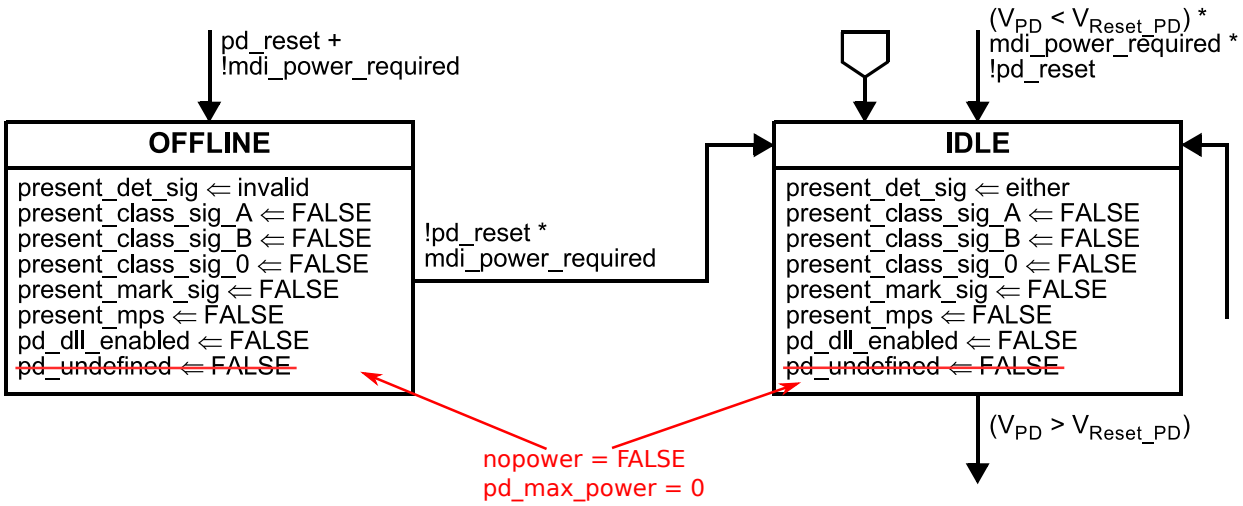
A control variable indicating the maximum power that the PD may draw from the PSE. See power classifications in Table 145–28.

Values:

inrush: There is no maximum power limit on the PD
0: The PD may draw up to 44mA of current
1: The PD may draw Class 1 power
2: The PD may draw Class 2 power
3: The PD may draw Class 3 power
4: The PD may draw Class 4 power
5: The PD may draw Class 5 power
6: The PD may draw Class 6 power
7: The PD may draw Class 7 power
8: The PD may draw Class 8 power

145.3.3.7 Single-signature PD state diagrams

Make changes to Figure 145–26 as follows:



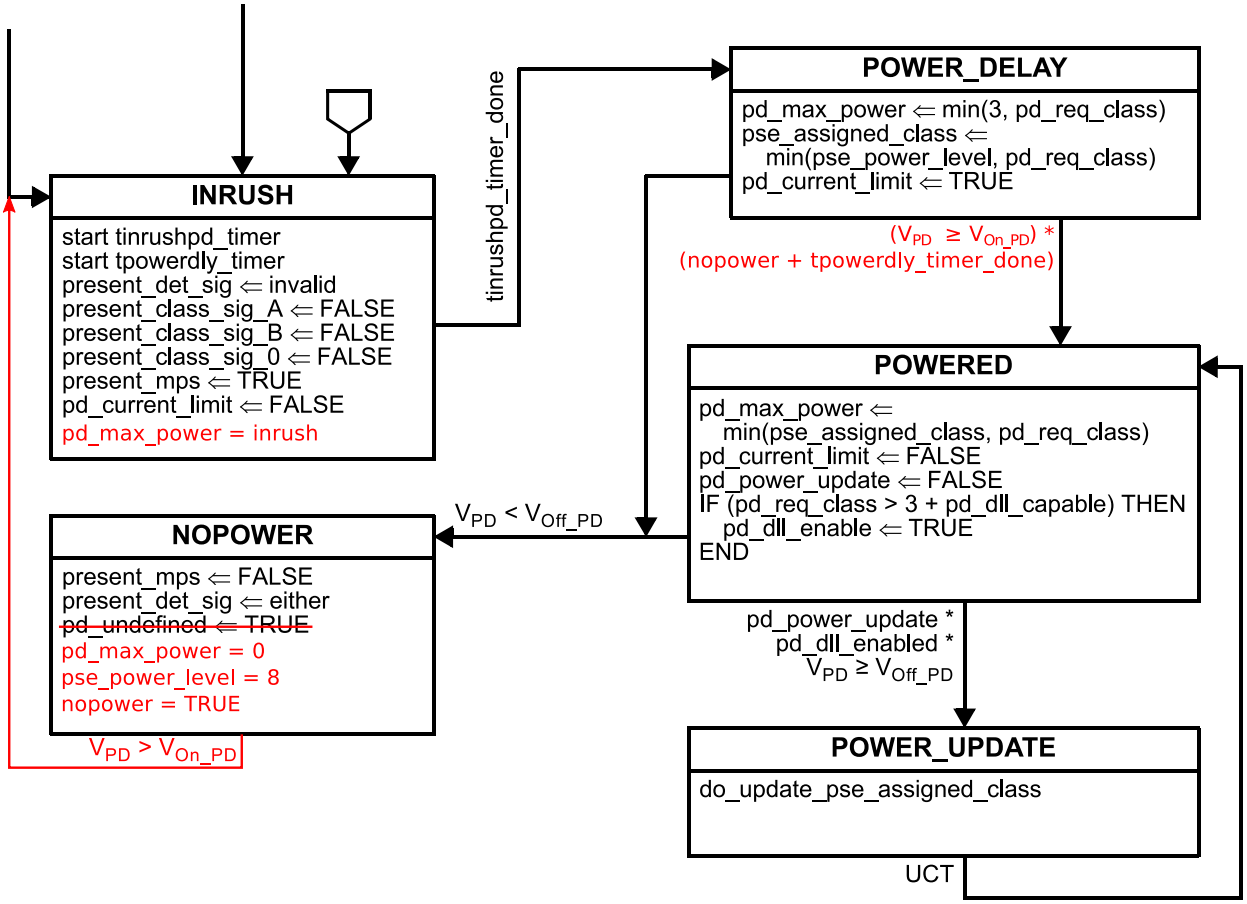


Figure 145–26—Single-signature PD state diagram *(continued)*

145.3.8.1 Input voltage

. . .

The PD shall turn on at a voltage in the range of V_{On_PD}. After the PD turns on, the PD shall stay on over the entire $V_{Port\_PD\text{-}2P}$ range. The PD shall turn off at a voltage in the range of V_{Off_PD}. For dual-signature PDs the requirements for V_{On_PD} and V_{Off_PD} apply to each pairset individually.

. . .

~~The behavior of a PD is undefined if V_{PD} falls below V_{Off_PD} once a PD has reached the POWER_DELAY or POWERED state, until V_{PD} falls below V_{Reset_PD}.~~

When the PD has reached the POWER_DELAY or POWERED state and V_{PD} falls below V_{Off_PD}, the PD may show a valid or invalid detection signature, and may or may not draw mark current, draw any class current, and show MPS.

Propagate these changes in the same manner to the dual-signature state machine.