33.3.3 PD state diagram

The PD state diagram specifies the externally observable behavior of a PD. The PD shall provide the behavior of the state diagram shown in Figure 33–17.

33.3.3.1 Conventions

The notation used in the state diagram follows the conventions of state diagrams as described in 21.5.

33.3.3.2 Constants

The PD state diagram uses the following constants:

V_{Reset_th}
: Reset voltage threshold (see Table 33–16)

V_{Mark_th}
: Mark event voltage threshold (see Table 33–16)

class_sig
: PD classification, one of either 0, 1, 2, 3, or 4 (see Table 33–14)

33.3.3.3 Variables

The PD state diagram uses the following variables:

mdi_power_required
: A control variable indicating the PD is enabled and should request power from the PSE by applying a PD detection signature to the link, and when the PSE sources power to apply the MPS to keep the PSE sourcing power.
  Values: FALSE: PD functionality is disabled.
  TRUE: PD functionality is enabled.

pd_2-event
: A control variable indicating whether the PD presents a 2-Event class signature
  Values: FALSE: PD does not present a 2-Event class signature
  TRUE: PD does present a 2-Event class signature

pd_dll_capable
: This variable indicates whether the PD implements Data Link Layer classification. See 33.6.
  Values: FALSE: The PSE does not implement Data Link Layer classification.
  TRUE: The PSE does implement Data Link Layer classification.

pd_dll_enabled
: A variable indicating whether the Data Link Layer classification mechanism is enabled. See 33.6.
  Values: FALSE: Data Link Layer classification is not enabled.
  TRUE: Data Link Layer classification is enabled.

pd_max_power
: A control variable indicating the max power that the PD may draw from the PSE. See power classifications in Table 33–14.
  Values: 0: PD may draw Class 0 power
  1: PD may draw Class 1 power
  2: PD may draw Class 2 power
  3: PD may draw Class 3 power
  4: PD may draw Class 4 power

pd_reset
: An implementation specific control variable that unconditionally resets the PD state diagram to the NOT_MDI_POWERED state.

Values: FALSE: The device has not been reset (default).
TRUE: The device has been reset.

power_received

An indication from the circuitry that power is present on the link.

Values: FALSE: Power not being received.
TRUE: Power being received.

present_det_sig

Controls presenting the detection signature (see 33.3.4) by the PD.

Values: FALSE: A non-valid PD detection signature is to be applied to the link.
TRUE: A valid PD detection signature is to be applied to the link.

present_class_sig

Controls presenting the classification signature (see 33.3.5) by the PD.

Values: FALSE: The PD classification signature is not to be applied to the link.
TRUE: The PD classification signature is to be applied to the link.

present_mark_sig

Controls presenting the mark event current and impedance (see 33.3.5.2.1) by the PD.

Values: FALSE: The PD does not present mark event behavior.
TRUE: The PD does present mark event behavior.

present_mps

Controls applying MPS (see 33.3.8) to the link by the PD.

Values: FALSE: The Maintain Power Signature (MPS) is not to be applied to the link.
TRUE: The MPS is to be applied to the link.

pse_power_type

A control variable that indicates to the PD the type of PSE by which it is being powered.

Values: 1: The PSE is a Type 1 PSE.
2: The PSE is a Type 2 PSE.

V_{Port}

Voltage at the PD PI.

33.3.3.4 Timers

All timers operate in the manner described in 14.2.3.2 with the following addition. A timer is reset and stops counting upon entering a state where “stop x_timer” is asserted.

tpowerdly_timer

A timer used to prevent the PD from drawing more than inrush current during the PSE’s inrush period; see T_{delay} in Table 33–17.

33.3.3.5 State diagrams

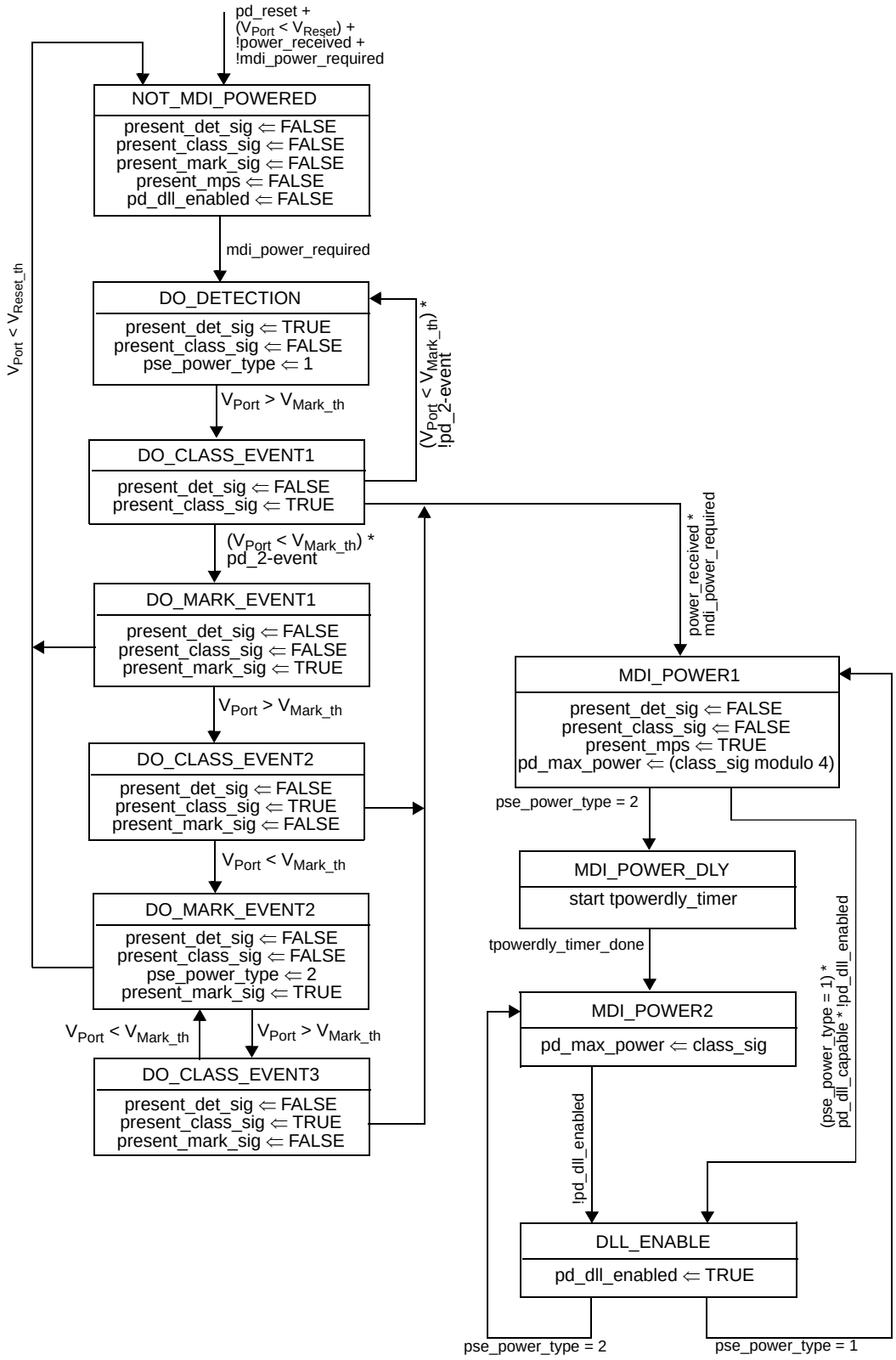

Figure 33–17—PD state diagram

NOTE—DO_CLASS_EVENT3 creates a defined behavior for a Type 2 PD that is brought into the classification range repeatedly.

NOTE—In a typical power_received event, the PI voltage will transition from the V_{Mark} range directly through the V_{Class} range into the power_received range. DO_CLASS_EVENT3 durations less than T_{class} may not allow a Type 2 PD to respond with the appropriate classification signature. There is no minimum DO_CLASS_EVENT3 time duration, and for DO_CLASS_EVENT3 times less than T_{class}, there is no requirement for a Type 2 PD to respond with a classification signature.