

# P802.3bt D3.0 – Mark & Hold v110

## Info (not part of baseline)

### Purpose

Mark & Hold allows a PSE to remain in the mark state for an indefinite amount of time, provided it checks that the PD draws a valid mark current. See full proposal and rationale ➡lukacs\_01\_0517

This baseline will:

- Make the necessary changes to the PSE state diagram
- Define parameters for checking the mark current (interval, current pass/fail levels)
- Change incorrect descriptions / requirements related to  $T_{pon}$

### Changelog

v100 First full proposal

- v110
- Fixed  $T_{pon}$  loophole that would allow an infinite amount of time to be spent between detection and entering markhold.
  - Require that the PSE check the mark current validity at least once by adding “mark\_valid” as a condition for leaving MARKHOLD. This prevents the PSE from zipping through MARKHOLD to reset the  $T_{pon}$  timer.
  - These changes only for single-signature, propagate to dual-signature when reviewed.

## 145.2.5.1 State diagram overview and timing

If power is to be applied, the PSE turns on power **within  $T_{pon}$ , as defined in Table 145–16**, after a valid detection, **or after leaving MARKHOLD, ~~in less than  $T_{pon}$  as defined in Table 145–16~~**. If the PSE cannot supply power within  $T_{pon}$ , it initiates and successfully completes a new detection cycle before applying power. See 145.2.8.13 for details.

## 145.2.5.4 Variables

**Add the following variables to 145.2.5.4 (create “\_sec” variants along with the “\_pri” versions):**

markhold

A variable indicating if the PSE state diagram is in the MARKHOLD state.

Values:

- FALSE: The PSE is not in the MARKHOLD state.  
TRUE: The PSE is in the MARKHOLD state.

markhold\_pri

A variable indicating if the PSE state diagram is in the MARKHOLD\_PRI state.

Values:

- FALSE: The PSE is not in the MARKHOLD\_PRI state.  
TRUE: The PSE is in the MARKHOLD\_PRI state.

markhold\_end

A variable that is asserted in an implementation dependent manner when the PSE is to proceed from the mark state to applying power.

Values:

- FALSE: The PSE is not to proceed to MARKHOLD\_EXIT.  
TRUE: The PSE is to proceed to MARKHOLD\_EXIT.

markhold\_end\_pri

A variable that is asserted in an implementation dependent manner when the PSE is to proceed from the mark state on the Primary Alternative to applying power.

Values:

- FALSE: The PSE is not to proceed to MARKHOLD\_EXIT\_PRI.  
TRUE: The PSE is to proceed to MARKHOLD\_EXIT\_PRI.

mark\_valid

This variable indicates the presence or absence of a valid mark current; see  $I_{Markhold}$  in Table 145–14.

Values:

FALSE:  $I_{Port}$  is less or equal than  $I_{Markhold}$ .

TRUE:  $I_{Port}$  is greater than  $I_{Markhold}$ .

mark\_valid\_pri

This variable indicates the presence or absence of a valid mark current on the Primary Alternative; see  $I_{Markhold}$  in Table 145–14.

Values:

FALSE:  $I_{Port-2P-pri}$  is less or equal than  $I_{Markhold}$ .

TRUE:  $I_{Port-2P-pri}$  is greater than  $I_{Markhold}$ .

option\_markhold

This variable indicates if the PSE uses the option of an extended duration last mark state.

Values:

FALSE: The PSE uses the extended duration last mark state.

TRUE: The PSE does not use the extended duration last mark state.

option\_markhold\_pri

This variable indicates if the PSE uses the option of an extended duration last mark state on the Primary Alternative.

Values:

FALSE: The PSE uses the extended duration last mark state.

TRUE: The PSE does not use the extended duration last mark state.

### 145.2.5.5 Timers

**Add the following timers to 145.2.5.5:**

tmh\_timer

A timer used to monitor the absence of a valid mark current; see  $T_{Markhold}$  in Table 145–14.

tmh\_timer\_pri

A timer used to monitor the absence of a valid mark current on the Primary Alternative; see  $T_{Markhold}$  in Table 145–14.

tmh\_timer\_sec

A timer used to monitor the absence of a valid mark current on the Secondary Alternative; see  $T_{Markhold}$  in Table 145–14.

### 145.2.5.6 Functions

do\_mark

This function produces the classification mark event voltage  $V_{Mark}$ , as defined in Table 145–14. This function does not return any variables.

do\_mark\_pri

This function produces the classification mark event voltage on the Primary Alternative  $V_{Mark}$ , as defined in Table 145–14. This function does not return any variables.

do\_mark\_sec

This function produces the classification mark event voltage on the Secondary Alternative  $V_{Mark}$ , as defined in Table 145–14. This function does not return any variables.

**Add a new functions as follows:**

do\_markhold

This function produces the classification mark hold event voltage  $V_{Markhold}$ , as defined in Table 145–14. This function does not return any variables.

do\_markhold\_pri

This function produces the classification mark hold event voltage  $V_{Markhold}$  on the Primary Alternative, as defined in Table 145–14. This function does not return any variables.

do\_markhold\_sec

This function produces the classification mark hold event voltage  $V_{Markhold}$  on the Secondary Alternative, as defined in Table 145–14. This function does not return any variables.

## 145.2.5.7 State diagrams

Change Figure 145–13 as follows:

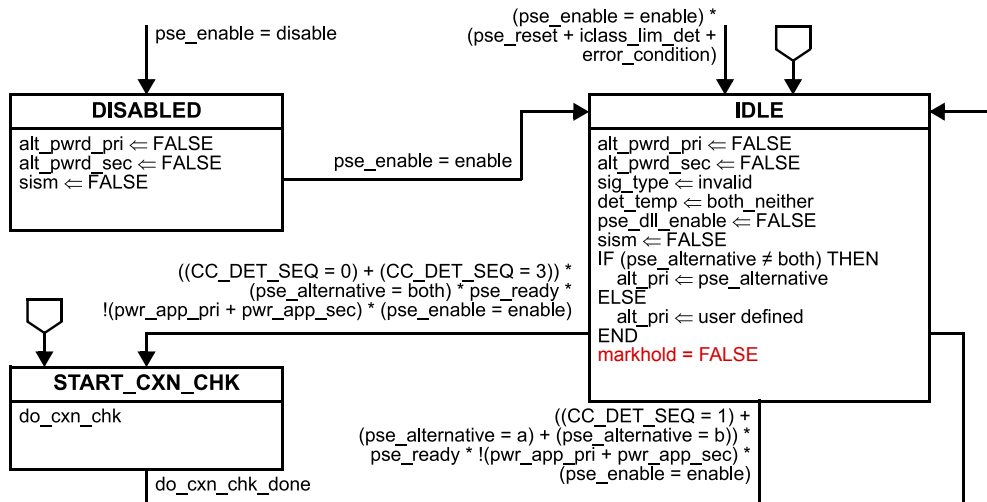


Figure 145–13 — Top level PSE state diagram

Change Figure 145–13 as follows:

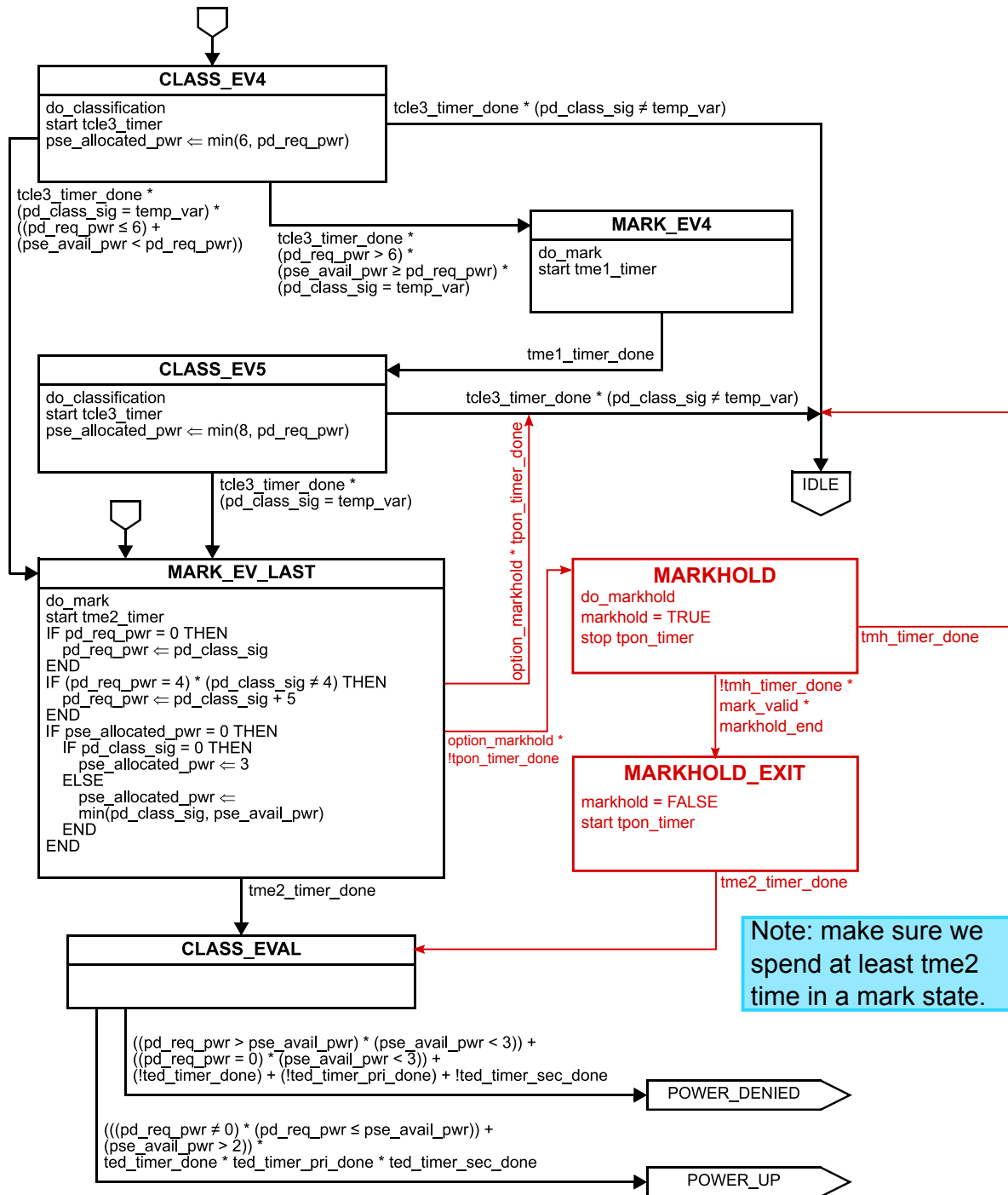


Figure 145–13 — Top level PSE state diagram (continued)

## Info (not part of baseline)

No changes to Figure 145–13 on page 130, however shown here because  $T_{pon}$  is checked here last.

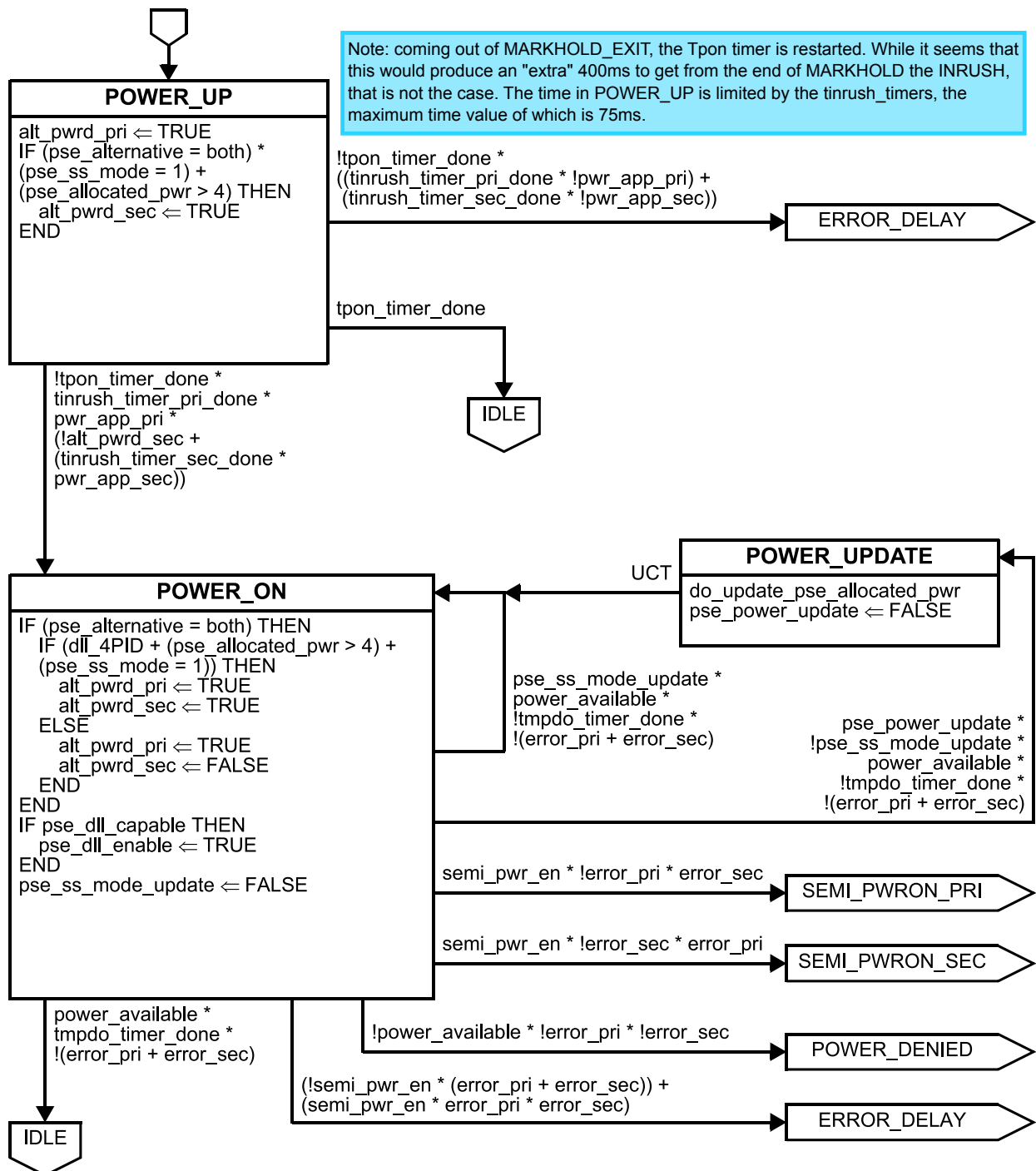
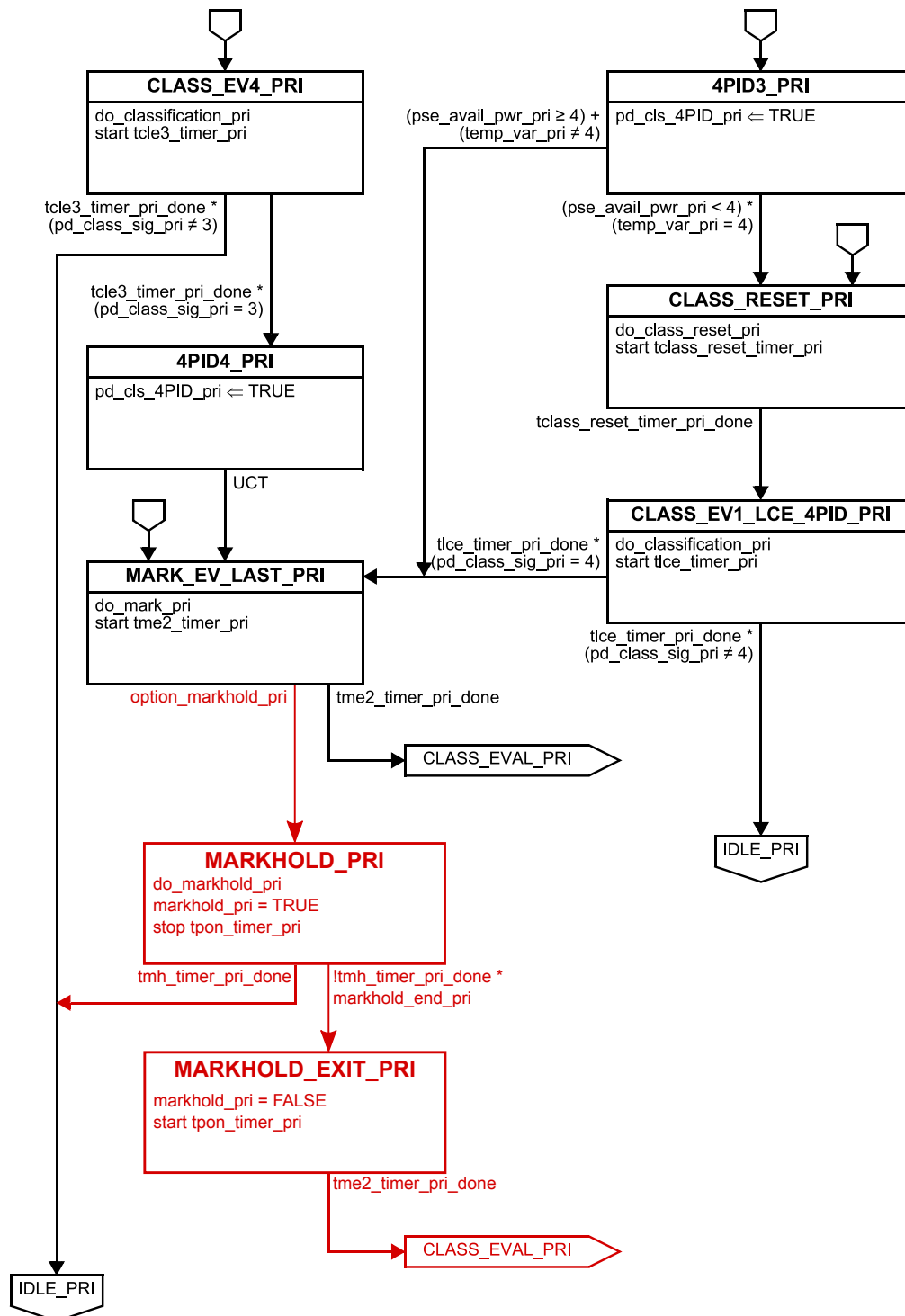


Figure 145–13 — Top level PSE state diagram (continued)

**Change Figure 145–15 as follows, change Figure 145–16 in the same way for Secondary:**



**Figure 145-15 — Primary Alternative dual-signature semi-independent PSE state diagram (continued)**

Add a new Figure before 145–17 as follows:

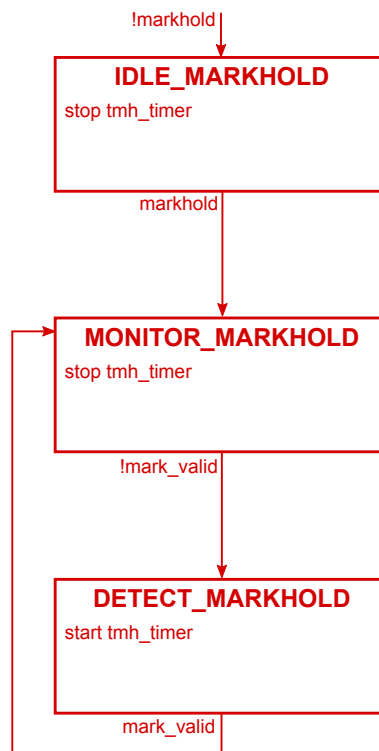


Figure 145–16a — PSE mark monitor state diagram for single-signature PDs or 2-pair operation

Add a new Figure after 145–16a as follows:

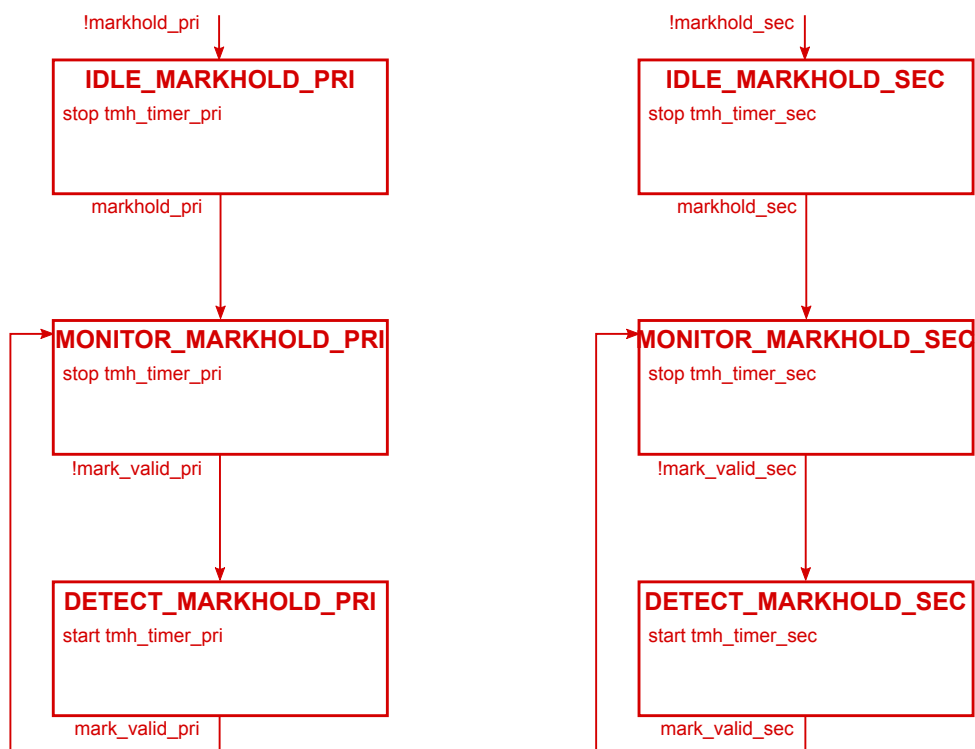


Figure 145–16b — PSE mark monitor state diagram for dual-signature PDs

### 145.2.7.1 PSE Multiple-Event Physical Layer classification

#### Info (not part of baseline)

The numbers below in Table 145–14 are placeholders and should be considered (TBD).

Note that the mark voltage in the mark range needs to be at least 8.5 volt to support Type 1 PDs that may worst case show a 26.3k $\Omega$  resistance with 1.9V of offset. The resulting minimum voltage to reach 250 $\mu$ A is then 8.5V.

*Add the following item to Table 145–14:*

**Table 145–14 — PSE Physical Layer classification electrical requirements**

Item	Parameter	Symbol	Units	Min	Max
2a	Mark hold event voltage	V <sub>Markhold</sub>	V	8.5	10
14a	Mark current dropout time	T <sub>Markhold</sub>	ms		100
14b	Mark current valid threshold	I <sub>Markhold</sub>	mA	0.15	0.25

### 145.2.8.13 Power turn on time

The specification for T<sub>pon</sub> in Table 145–16 applies to the PSE power up time for a PD after completion of detection, **or after leaving MARKHOLD**.

PSEs, when connected to a single-signature PD, shall reach ~~the~~ POWER\_ON ~~state~~ within T<sub>pon</sub> after completing detection on the last pairset, **or after leaving MARKHOLD**. When connected to a dual-signature PD, PSEs shall reach ~~the POWER\_ON state~~ POWER\_ON\_PRI or POWER\_ON\_SEC for ~~a~~ the given pairset within T<sub>pon</sub> after completing detection on the same pairset, **or after leaving MARKHOLD\_PRI or MARKHOLD\_SEC**.