

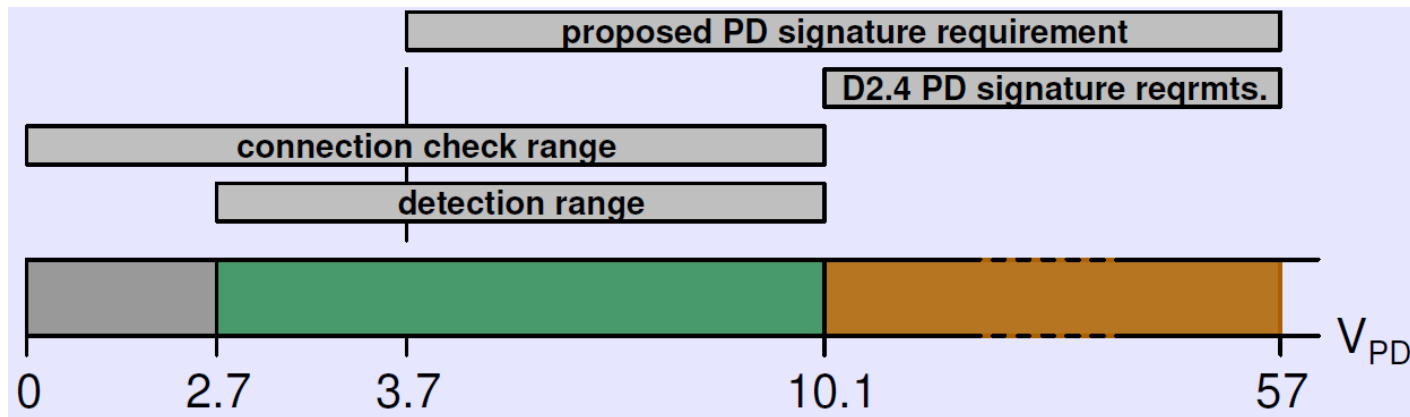
PD Signature Configuration

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Problem Statement

- ▶ PD Signature Configuration, single-signature PD
 - Behavior is undefined for $V_{PD} < 10.1V$
 - Connection Check and Detection are performed by PSE in this voltage range
- ▶ PD designer needs clear guidance on how to behave below 10.1V
 - Ensures that PD properly identified by PSE as “single-signature”



Source: yseboodt_09_0517

- ▶ Single-signature PDs present the same detection resistor to both Modes
- ▶ A given Mode may be measured for a valid PD detection signature
- ▶ Certain effects on the other Mode will be apparent on the given Mode
 - Any current sourced on the other Mode
 - Specific application of voltage on the other Mode ($V_{PD_Other} > V_{PD_Given}$)
- ▶ **At some threshold of disturbance, the detection signature on a given Mode will no longer meet the “valid PD detection signature” requirements in Table 145–21**

Single-signature PD Considerations

Cont'd.



Table 145–21—Valid PD detection signature characteristics, measured at the PD PI

| Parameter | Conditions | Min | Max | Unit | Additional information |
|--|--|------|------|---------------|------------------------|
| R_{detect} (at any 1 V or greater chord within the voltage range conditions) | 2.7 V to 10.1 V | 23.7 | 26.3 | k Ω | — |
| V_{offset} | — | 0 | 1.9 | V | See Figure 145–29 |
| Voltage at the PI | $I_{\text{Port-2P}} = 124 \mu\text{A}$ | 2.7 | | V | — |
| Input capacitance | 2.7 V to 10.1 V | 0.05 | 0.12 | μF | — |
| Series input inductance | 2.7 V to 10.1 V | | 100 | μH | — |

- ▶ 124 μA is the minimum amount of current required to generate 2.7V (minimum detection voltage) at the PD PI
 - Applies to both common detection methods, Forced Voltage and Forced Current
- ▶ For a single-signature PD, applying 124 μA to the “other” PD Mode guarantees that detection on the “given” PD Mode will not meet the requirements of 145–21
 - The PD will “not present a valid detection signature”

Voltage Disturbance



- ▶ Voltage disturbance is only working when current is flowing
- ▶ A system that uses voltage to disturb the other Mode sees less than 124uA on the detecting Mode when pollution is active
- ▶ The parameter “Voltage at the PI” (2.7V, 124uA) is violated

- ▶ Current disturbance causes an offset on the given Mode
- ▶ A system that uses a current disturbance $> 124\mu\text{A}$ on the other mode can expect $V_{os} > 2.7\text{V}$ on the given Mode
- ▶ The parameter V_{offset} (1.9V,max) is violated

1) Define single-signature PD behavior for $V_{PD} < 10.1V$

► Modify 145.3.5, paragraph #1 as follows:

- Alternative #1: Current Only
 - “A single-signature PD shall present a valid detection signature, as defined in Table 145-21, on a given Mode when no voltage or current is applied on the other Mode, and shall ~~present an invalid~~ not present a valid detection signature on ~~that the given~~ Mode when any ~~voltage between 10.1V and 57V~~ current greater than $124\mu A$ is applied to the other Mode. These requirements apply to both Mode A and Mode B.”
- Alternative #2: Voltage and Current
 - “A single-signature PD shall present a valid detection signature, as defined in Table 145-21, on a given Mode when no voltage or current is applied on the other Mode, and shall ~~present an invalid~~ not present a valid detection signature on ~~that the given~~ Mode when ~~any voltage between 10.1V and 57V~~ any voltage in the range of 3.7V to 57V is applied to the other Mode or any current greater than $124\mu A$ is applied to the other Mode. These requirements apply to both Mode A and Mode B.”

2) Add a note to define “not a valid signature”

► 145.3.5, add the following after paragraph beginning with “A dual-signature PD shall present...”

- A valid detection signature meets every requirement in Table 145-21 across all specified conditions. A failure under any allowed condition is considered “not a valid signature.”