

# Transient section 145.3.8.6 v103

## Info (not part of baseline)

- Figure 145–31 tries to show an overview of the PD requirements when exposed to transients TR1 and TR2. Issues:
- The Figure and description of parameters used is a complete duplicate of normative information in the same subclause
  - It doesn't add any new information or insight
  - The Figure y axis is labeled “power” but at the top of the box a current level is denoted
  - $T_{LIM-2P}$  (PSE parameter) is tied to PSE Type. It is 10 ms for Type 3 and 6 ms for Type 4. The PD does not see the difference between a Type 3 and a Type 4 PSE, hence the reference to  $T_{LIM-2P}$  needs to be replaced by “6 ms”.

The proposed resolution is to remove the Figure and description and correct the text accordingly.

### 145.3.8.6 PD behavior during transients at the PSE PI

A PD shall continue to operate without interruption in the presence of transients at the PSE PI as defined in 145.2.8.3. A single-signature PD includes an input capacitance  $C_{Port}$  as defined in Table 145–28. A dual-signature PD includes an input capacitance  $C_{Port-2P}$  as defined in Table 145–28 on each pairset.

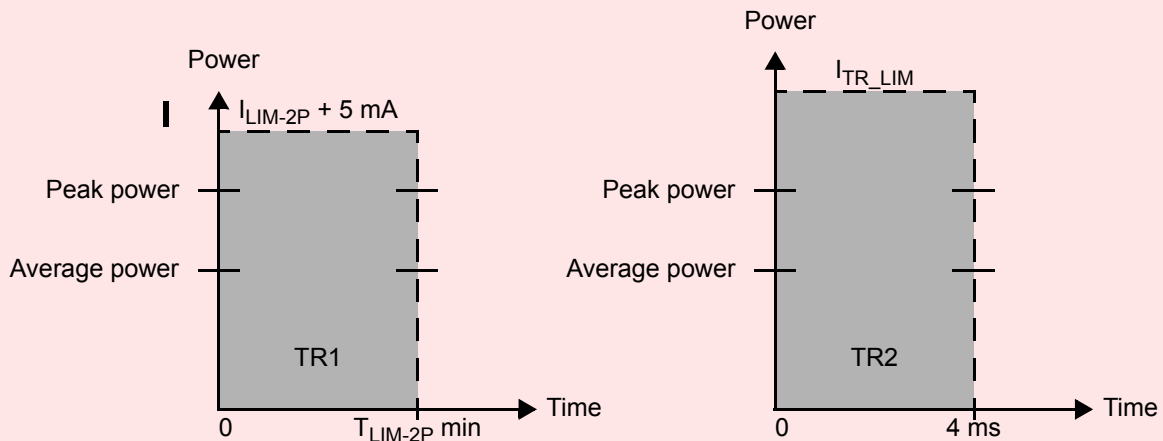
The following PD configurations intrinsically meet the requirements in this subclause:

- Single-signature Type 3 PDs with peak power not exceeding  $P_{Class\_PD}$ , and with an input capacitance of 180  $\mu F$  or less
- Single-signature Type 4 PDs with peak power not exceeding  $P_{Class\_PD}$ , and with an input capacitance of 360  $\mu F$  or less
- Dual-signature Type 3 PDs with peak power draw not exceeding  $P_{Class\_PD-2P}$ , and with an input capacitance of 110  $\mu F$  or less per pairset
- Dual-signature Type 4 PDs with peak power draw that does not exceed  $P_{Class\_PD-2P}$  and with an input capacitance of 180  $\mu F$  or less per pairset

Table 145–29 defines two PSE transient conditions and PD Types to which these apply. ~~Figure 145–31 shows operating bounds for the transients in Table 145–29. The shaded regions begin with the application of the transient and end at the times indicated in the Figure. These shaded regions can exceed normal operating limits and are not included in the average and peak operating power requirements set forth in Table 145–28. During a transient the input power of the PD may exceed  $P_{Peak\_PD}$ .~~

**Table 145–29—Transient conditions**

Transient condition	Initial voltage	Final voltage	Source dv / dt	Source resistance	Source current
TR1	$V_{Port\_PSE-2P \min}$	56 V	2250 V/s	$R_{Ch} \pm 2.5\%$	$I_{LIM-2P} + 5 \text{ mA}$
TR2	$V_{Port\_PSE-2P \min}$	$V_{Port\_PSE-2P \min} + 2.5 \text{ V}$	3.5 V/ $\mu s$	$1.5 \Omega \pm 2.5\%$	> 5 A capability



**Figure 145-31—Transient test conditions operating bounds**

Figure 145-31 shows transient condition operating bounds where

- Average power is  $P_{Class\_PD}$  or  $P_{Class\_PD-2P}$  as specified in Table 145-28 and 145.3.8.2, or the average power limit specified in 145.3.8.2.1, if the applicable conditions for that subclause are met
- Peak power is  $P_{Peak\_PD}$  or  $P_{Peak\_PD-2P}$  as specified in Table 145-28 and 145.3.8.4, or the average power limit specified in 145.3.8.4.1, if the applicable conditions for that subclause are met
- $TR_n$  shows the operating bounds of the transient condition, where  $n$  is the number of the condition. These are not subject to the normal average and peak power limits
- $T_{LIM-2P\ min}$  is the minimum  $T_{LIM-2P\ min}$  value, as defined in Table 145-16
- $I_{LIM-2P}$  is  $I_{LIM-2P}$  per pairset, as defined in Table 145-16
- $I_{TR\_LIM}$  is the maximum allowed PD current defined in Table 145-30

**Info (not part of baseline)**

Having a dependence to  $T_{LIM-2P}$  in the PD section per D2.4 is an issue, since the value of  $T_{LIM-2P}$  depends on Type. The PD can't see the difference between Type 3 and Type 4.

When ~~the PD is operating under its worst-case current draw for its assigned Class and~~ transient TR1 is applied, the PD shall meet the operating power limits after  $T_{LIM-2P\ min}$  as defined in ~~Figure 145-31~~ Table 145-28.

When transient TR2 is applied, the peak current shall not exceed  $I_{TR\_LIM}$ , as defined in Table 145-30, and the PD shall meet the operating power limits after 4 ms ~~as defined in Figure 145-31~~.

These requirements apply to each pairset individually if the PD is a dual-signature PD.

**Table 145-30—PD current parameters during transients at the PSE PI**

Parameter	Symbol	Unit	Min	Max	PD Type	PD signature	Assigned Class
Input spike current limit	$I_{TR\_LIM}$	A		2.5	3, 4	dual-signature	All
					3	single-signature	< 5
					3	3, 4	single-signature