PD pair-to-pair current unbalance Specifications

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Overview

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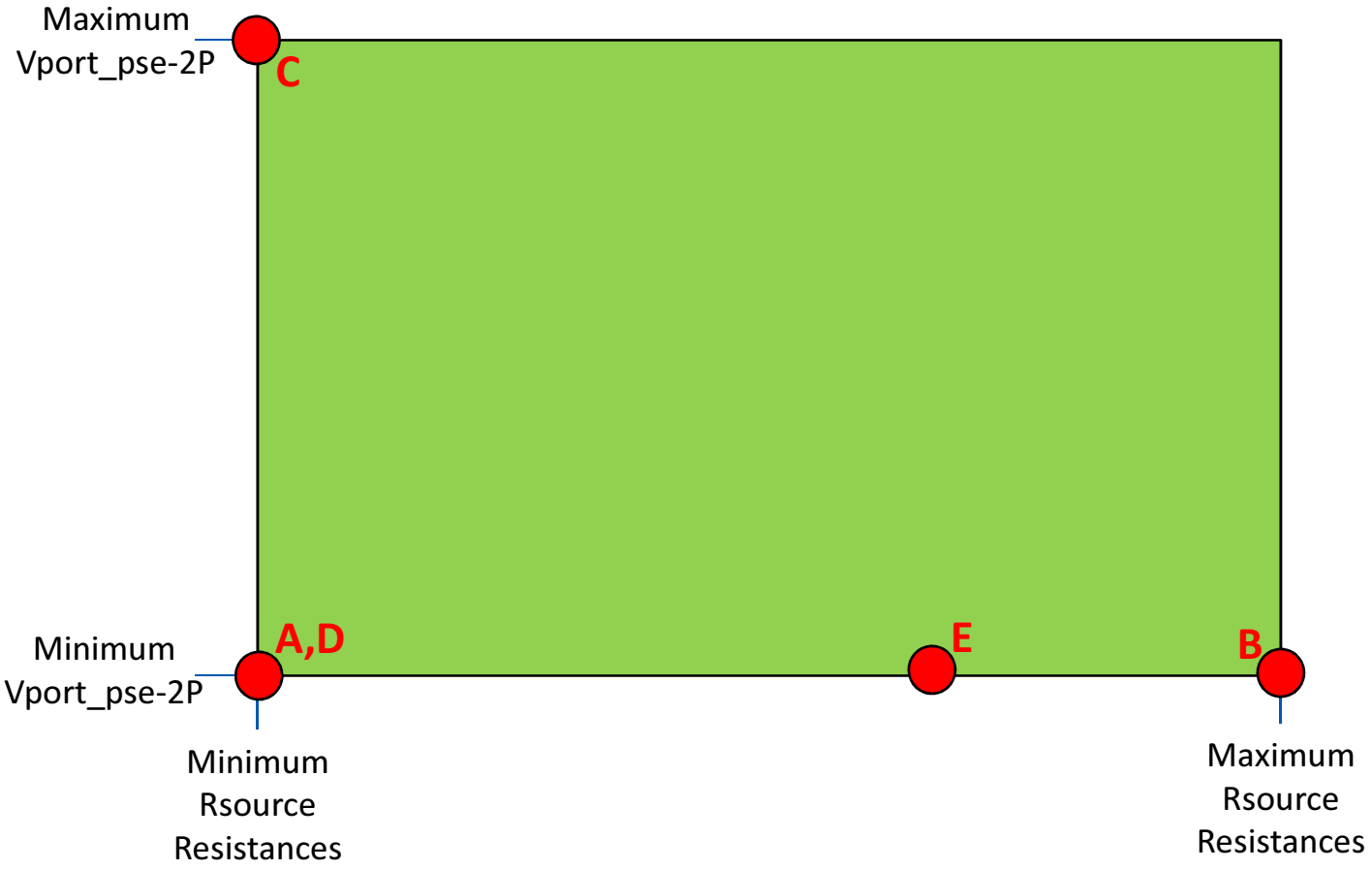
Section 33.3.8.10 provides a means of evaluating whether PDs will meet the Icon-2P and Icon-2p-unb limits specified for PSEs

The suggested changes herein are to prevent possible misinterpretation of the requirements in 33.3.8.10

In particular, the importance of evaluating pair-set current over the full Vport_pse and Rsource ranges is highlighted

Icon-2P_unb failure points for 5 different PDs



PD Evaluations

- **Spice evaluations C-F used the model in 33.3.8.10**
  - **A,B are known from previous unbalance efforts**

	Type	Notes
A	3	From Previous work; worst case pairset current is at shortest cable
B	4	From Previous work; worst case pairset current is at longest cable
C	3	100bt transformer in one pairset, 10W constant power + 77-Ohm Resistance load
D	4	100bt transformer in one pairset
E	4	Extended Power, increased to 78W at <4-Ohms Rchan
F	4	100bt Transformer, FET Bridge, 5% margin between max power and PClass_PD

Case F, which passes, is an example of a design which does not follow Annex A5 (informative) guidelines

Proposed Updates to 33.3.8.10

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33.3.8.10 PD pair-to-pair current unbalance

Under all operating states, Single-signature PDs assigned to Class 5 or higher shall not exceed ICon-2P-unb for longer than TCUT-2P min as defined in Table 33–17 on any pair when PD PI pairs of the same polarity are connected to ~~any~~ all possible common source voltages in the range of VPort_PSE-2P through two common mode resistances, Rsource_min and Rsource_max, where Rsource_max = 1.186 * Rsource_min, and Rsource_min is all possible resistances in the range of 0.168 Ω to 5.28 Ω as shown in Figure 33–~~39~~40.

Under all operating states, Dual-signature PDs shall not exceed ICon-2P as defined in Equation (33–7) for longer than TCUT-2P min as defined in Table 33–17 on any pair when PD PI pairs of the same polarity are connected to ~~any~~ all possible common source voltages in the range of VPort_PSE-2P through two common mode resistances, Rsource_min and Rsource_max, where Rsource_max = 1.186 * Rsource_min, and Rsource_min is all possible resistances in the range of 0.168 Ω to 5.28 Ω as shown in Figure 33–~~39~~40.

Rsource_min and Rsource_max represent the Vin source common mode effective resistance that consists of the PSE PI components (RPSE_min and RPSE_max as specified in 33.2.8.4.1, VPort_PSE_diff as specified in Table 33–17 and the channel resistance). Common mode effective resistance is the resistance of two conductors of the same pair and their other components connected in parallel including the effect of VPort_PSE_diff. IA and IB are the pair currents of pairs with the same polarity. See Annex 33A.5 for design guide lines for meeting the above requirements.

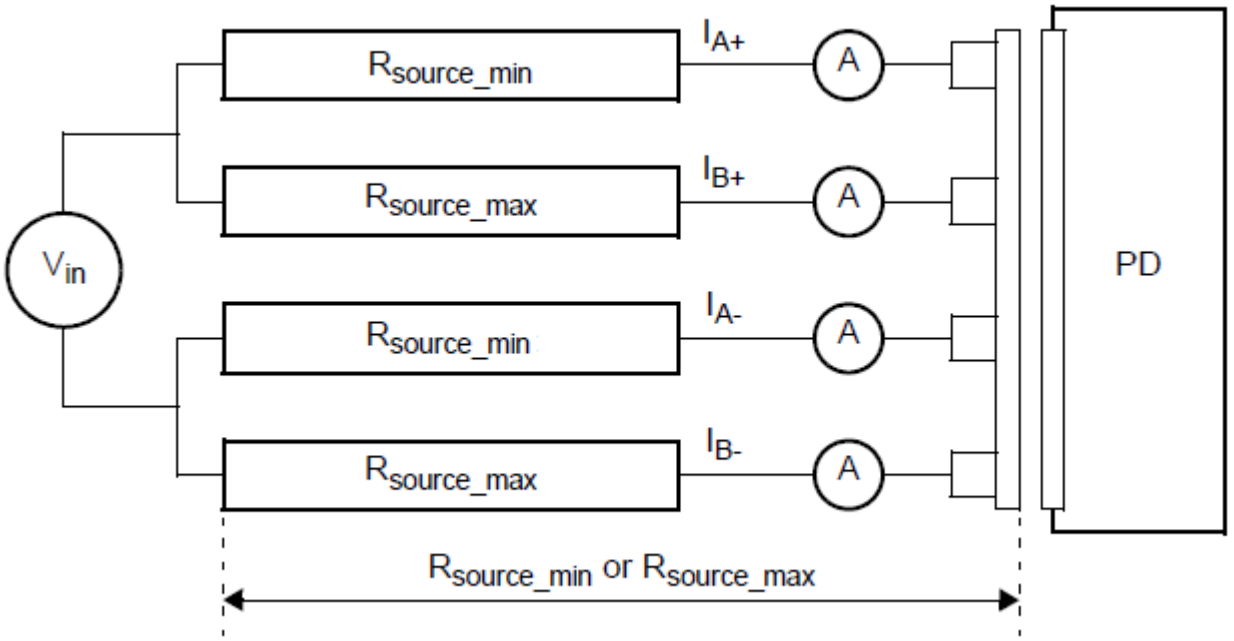

Figure 33–40—~~PD PI pair-to-pair current unbalance test setup~~ ICon-2P, Icon-2P-unb Evaluation Model

NOTE 1—R_{source} includes ~~test setup plug~~ resistance R_{con} which is the connection resistance at the PD. The maximum recommended R_{con} value is 0.02 Ω. ~~however it is test setup implementation specific choice how to meet R_{source_min} and R_{source_max}.~~

NOTE 2—The pairset current limits should also be met when Rsource_max and Rsource_min are swapped between pairs of the same polarity.