



# PD Front End Circuits

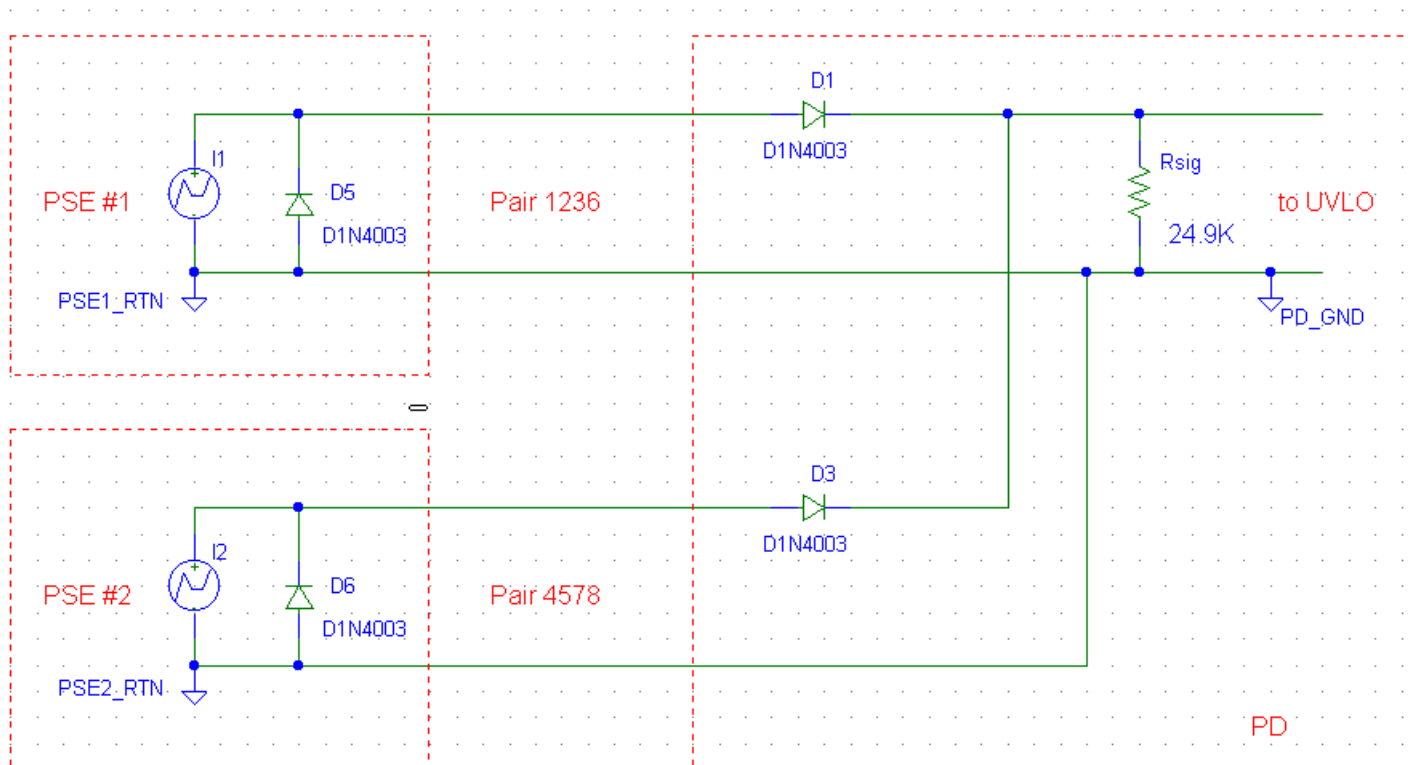
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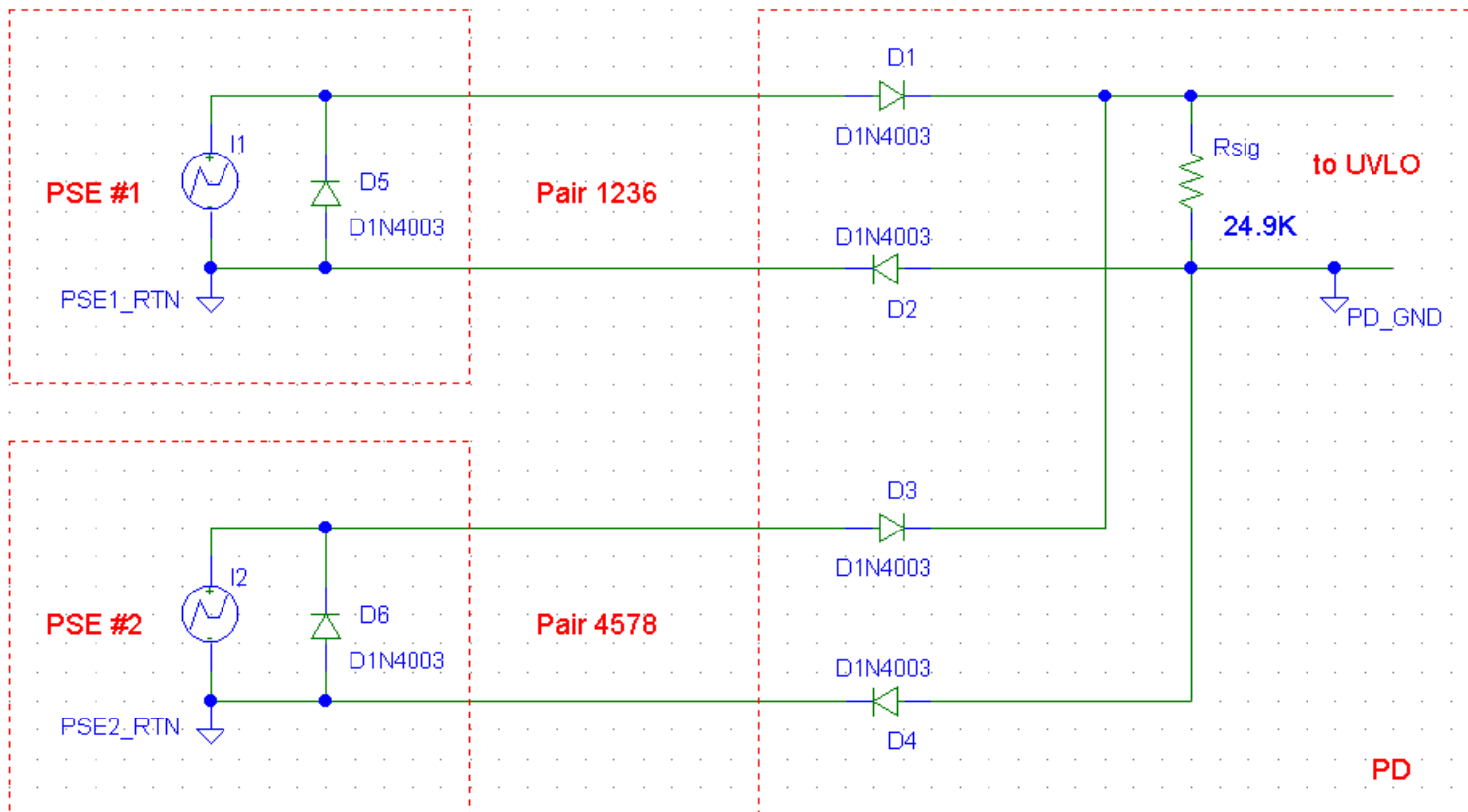
## Circuit #1, common signature, straight polarity, power path has 1 diode drop

- the simplest, lowest part count
- single, common signature
- 2 diodes, 1 resistor
- however, will not prevent ground loops between PSE#1 and PSE#2



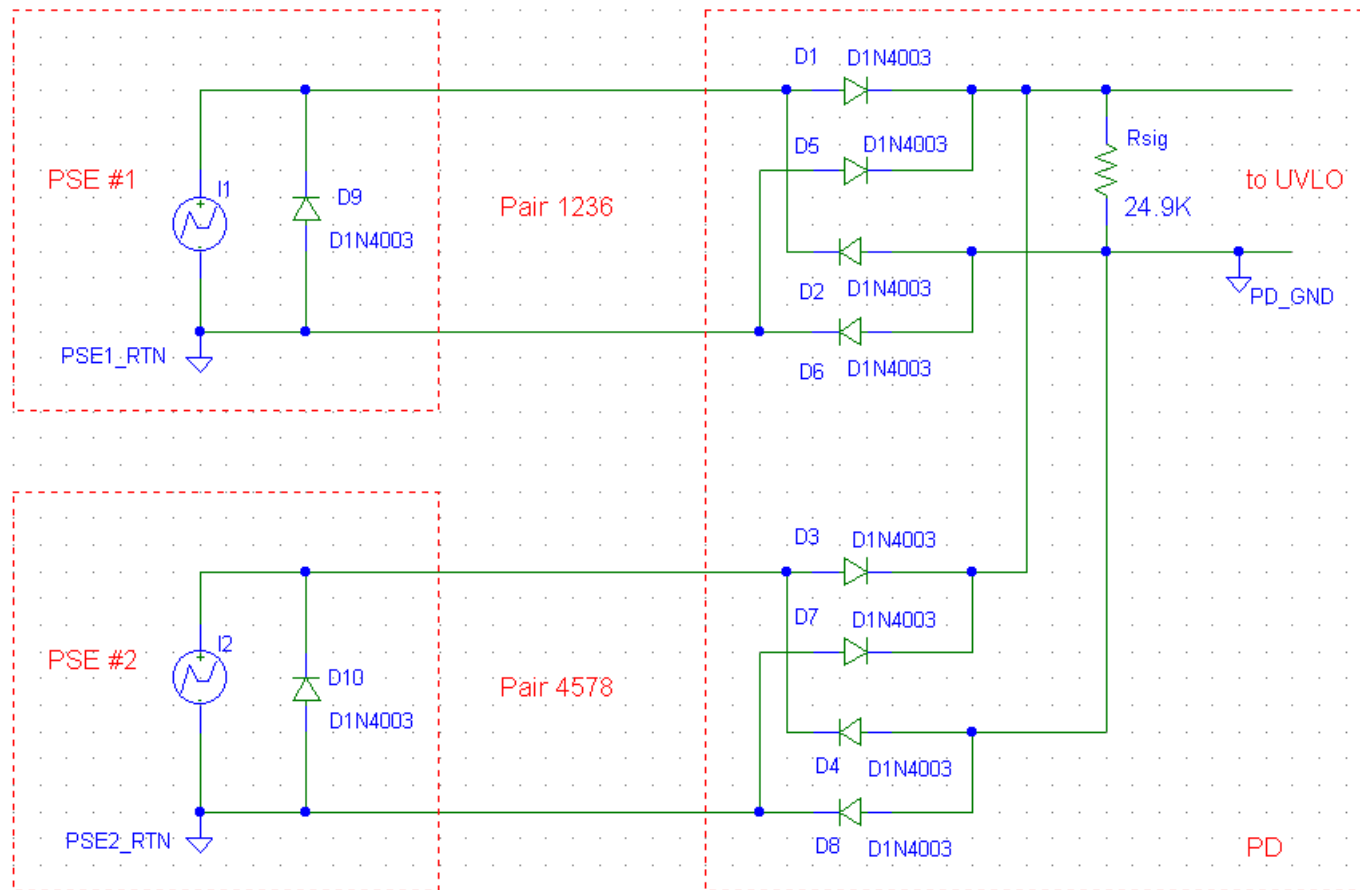
## Circuit #2, common signature, straight polarity, power path has 2 diode drops

- single, common signature
- 4 diodes, 1 resistor
- the extra 2 diodes prevent ground loops between PSE#1 and PSE#2



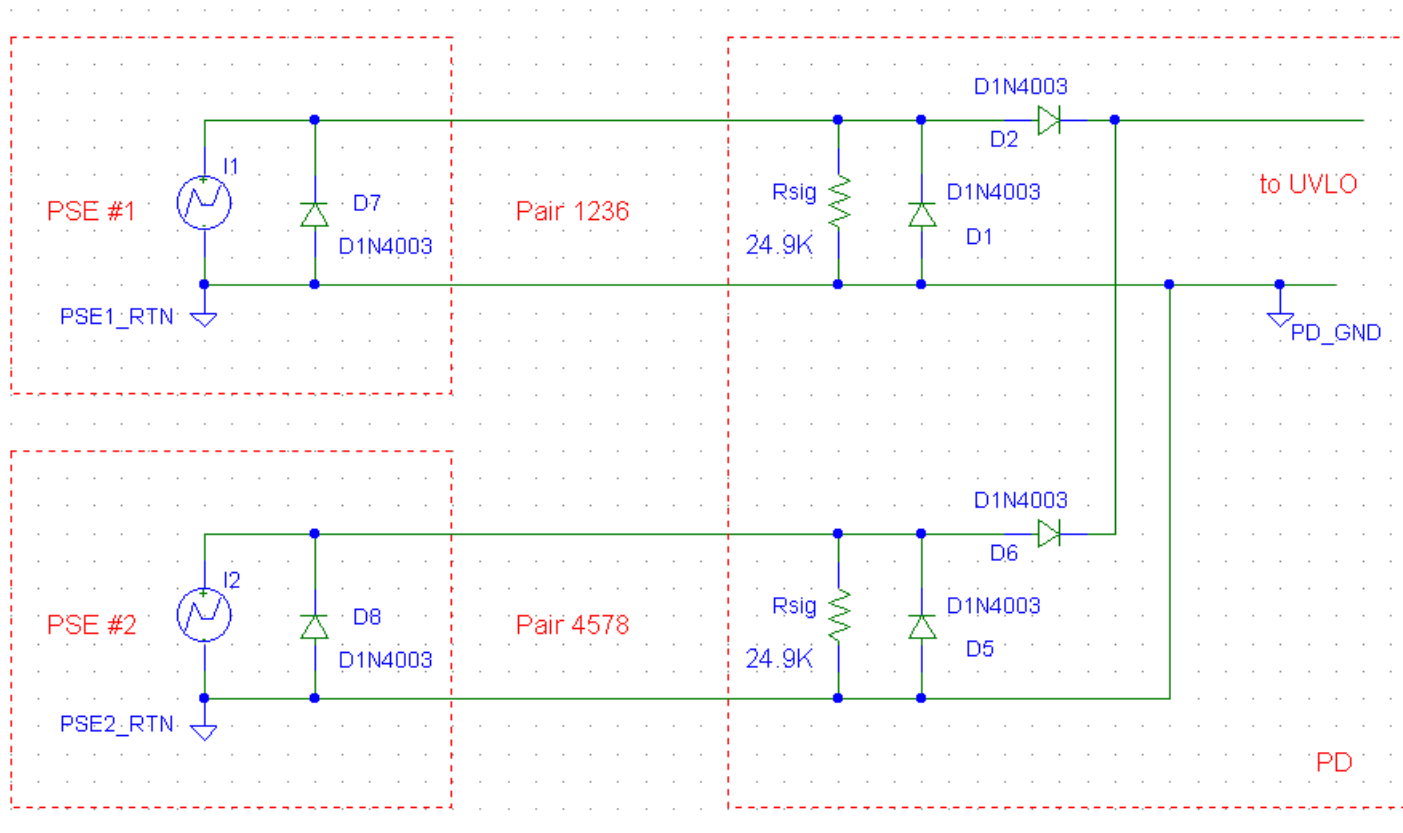
## Circuit #3, common signature, auto polarity, power path has 2 diode drops

- single, common signature
- 8 diodes, 1 resistor
- the diodes prevent ground loops between PSE#1 and PSE#2



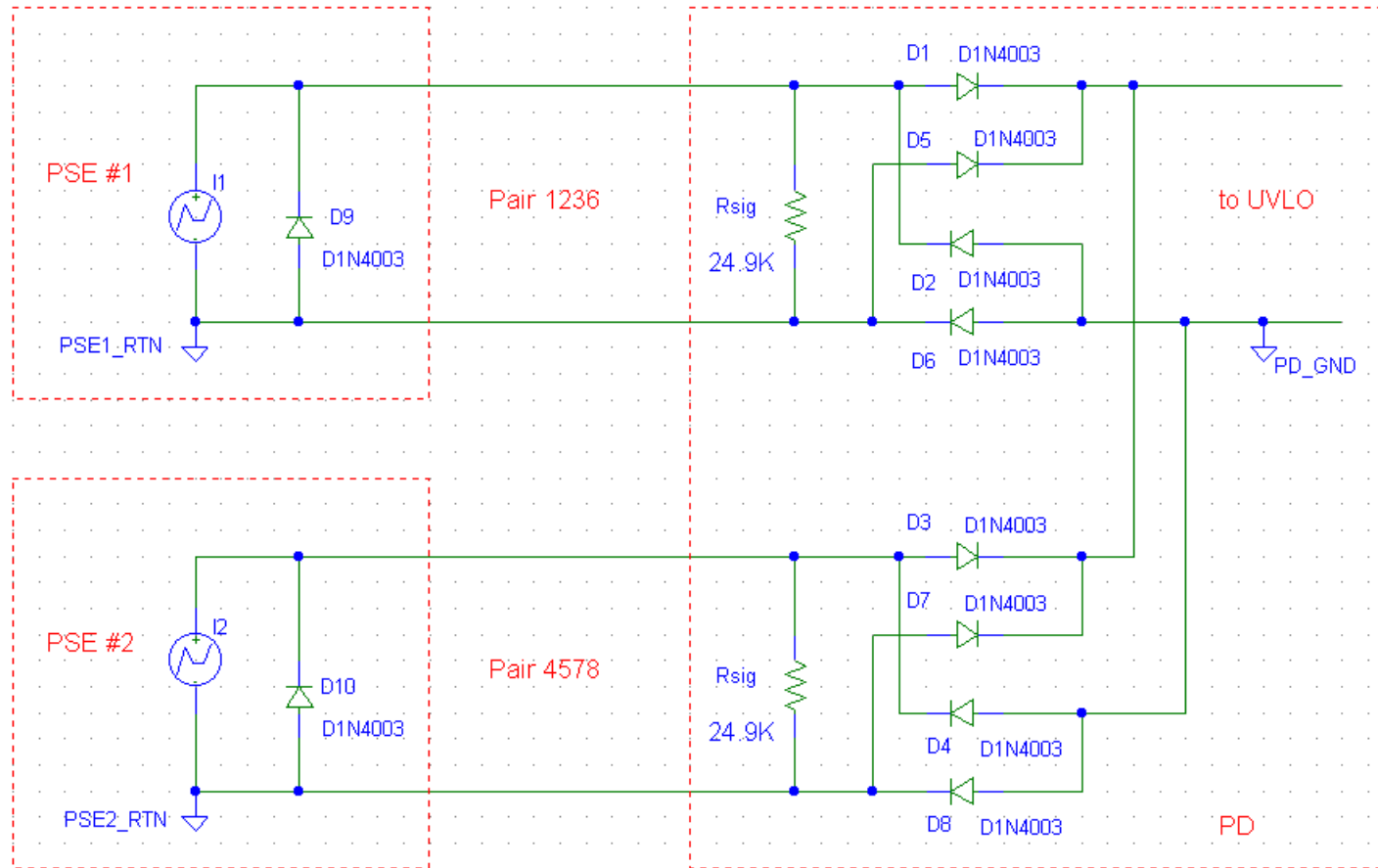
## Circuit #4, separate signatures, straight polarity, power path has 1 diode drop

- separate signatures on each pair set
- 4 diodes, 2 resistors
- however, will not prevent ground loops between PSE#1 and PSE#2
- how to keep both PSE's from detecting?



## Circuit #5, separate signatures, auto polarity, power path has 2 diode drops

- single, common signature
- 8 diodes, 2 resistors
- the diodes prevent ground loops between PSE#1 and PSE#2
- how to keep both PSE's from detecting?



## My Conclusions

- **Straight Polarity Circuits**

- The lowest cost is circuit #1, and other than possible ground loop issue, this circuit lends itself to using the PSE backoff or idle method. It has only one diode drop in the power path
- Circuit #2 is like #1, except that it prevents possible ground loops at the expense of 2 extra diodes
- Circuit #4 has 2 separate signatures and other than possible ground loop issue, this circuit would require more parts in the PD to guarantee that one, but not both PSE's will power up. It has only one diode drop in the power path. Again, it has only one diode drop in the power path

- **Auto Polarity Circuits**

- Circuit #3 lends itself to using the PSE backoff or idle method. It has 2 diode drops in the power path, which is the minimum that can be achieved with the auto polarity feature
- Circuit #5 has 2 separate signature resistors. This circuit would require more parts in the PD to guarantee that one, but not both PSE's will power up. Other than that, it is similar to Circuit #3.

- **My choices:**

- I like the common signature resistor, which both PSE's must probe. It should be possible to make sure the one PSE will pollute the other at this point. A backoff or idle method in the PSE should guarantee that at least one PSE will power up.
- Therefore, I like these the best:
  - Circuit #1 or #2 for straight polarity
  - Circuit #3 for auto polarity