PSE 4P Fault behaviour v101

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March 2016
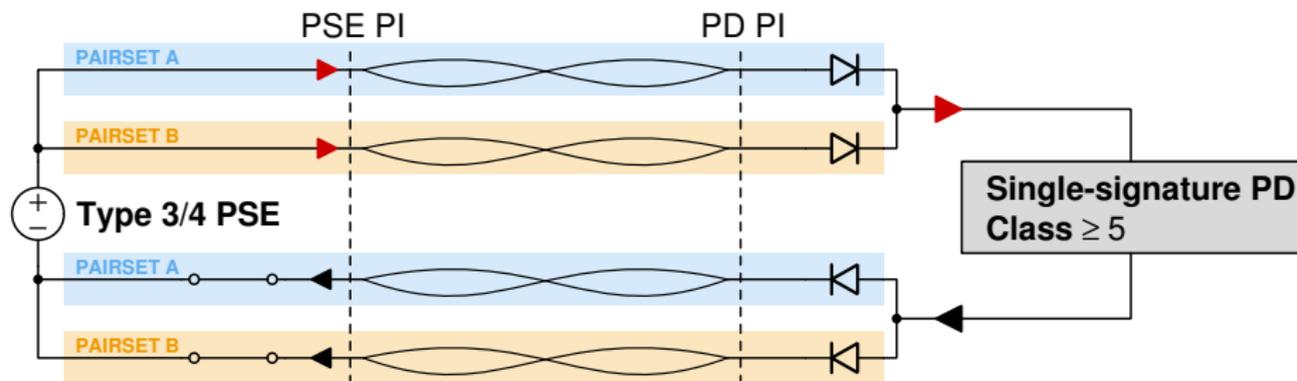
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Scope

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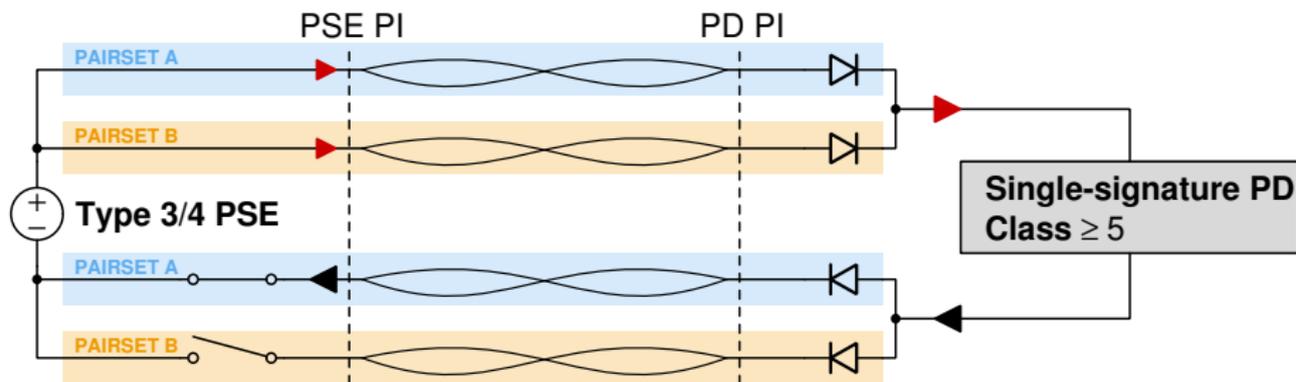
This is a normally operating Type 3/4 PSE, providing 4-pair power to a Class 5 or higher single-signature PD.

A fault occurs on a pairset and the PSE turns it off.

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Fault resolution

If the connected PD is near the maximum allowed power of its Class, the complete I_{Port} current will transfer to the remaining pairset, causing it to turn off as well.

If the connected PD is drawing less than $I_{Con-2P\_unb} \times V_{PSE}$, the system could continue to operate.

What is the desired behaviour in this case?

- ▶ The PSE is allowed, but not required, to shut down the remaining pairset
- ▶ The PSE is required to shut down the remaining pairset within a small (some 100ms) amount of time

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Reasons to STAY ON

A single-signature PD that is designed to deal with this specific case can continue to operate at reduced power.

But…

- ► Dual-signature PDs are the right tool for the job if independent pairset behaviour is desired
- ► Getting to this scenario most likely due to a cable fault $\rightarrow$ data probably gone
- ► Only works if PSE doesn't shut down both pairsets anyway (market confusion)

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Reasons to SHUT DOWN

- ► Shutting down upon fault is simple and consistent behaviour across PSEs, which aids in fault diagnostics.
- ► PDs may *seem* to work after a pairset fault, but may get disconnected as soon as power consumption increases.
- ► The PD negotiated a certain amount of power. After such a fault, the PD no longer can draw P_{Class_PD}. It is hard for a PD to find this out.
  This behaviour is not specified for PSEs $\rightarrow$ interoperability issue.

Conclusion

While there certainly is a use case to maintain 2P power in case of a fault, this is addressed appropriately by dual-signature PDs. There are significant disadvantages for systems with single-signature PDs that are not designed to deal with this fault behaviour.

Recommend to change (page 110, line 2):
When connected to a single-signature PD, a Type 3 or Type 4 PSE should (TBD) remove power from both pairsets before the current exceeds the "PSE upperbound template" on either pairset.

To:
When connected to a single-signature PD, a Type 3 or Type 4 PSE shall remove power from any pairset before the current exceeds the "PSE upperbound template" on that pairset, and remove power from the other pairset within (TBD) ms.

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