



Connection Check Requirements

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Problem: Confounding CC, Detect Results

- Connection Check result assumes knowledge of PD detection signature
 - Most CC_DET_SEQ may “discover” dual-signature PD, apply power to a pairset prior to performing detection on both pairsets:

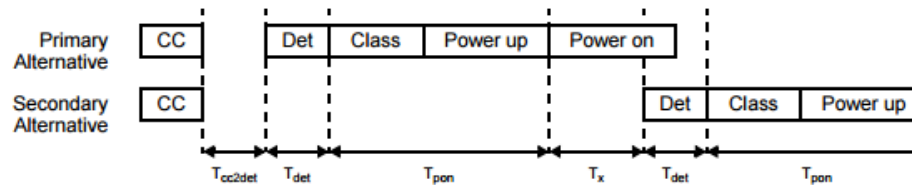


Figure 145B-3—PSE implementing **CC_DET_SEQ=0**, do_cxn_chk result is dual, staggered power on

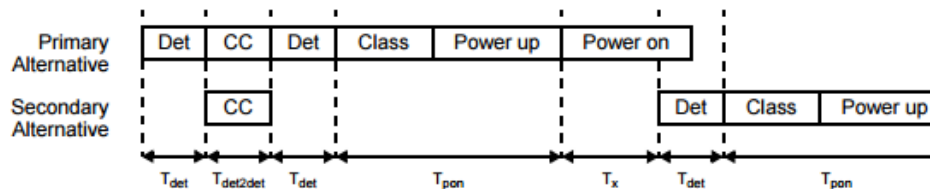


Figure 145B-6—PSE implementing **CC_DET_SEQ=1**, do_cxn_chk result is dual, staggered power on

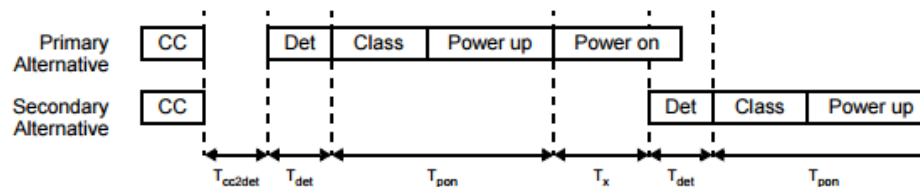
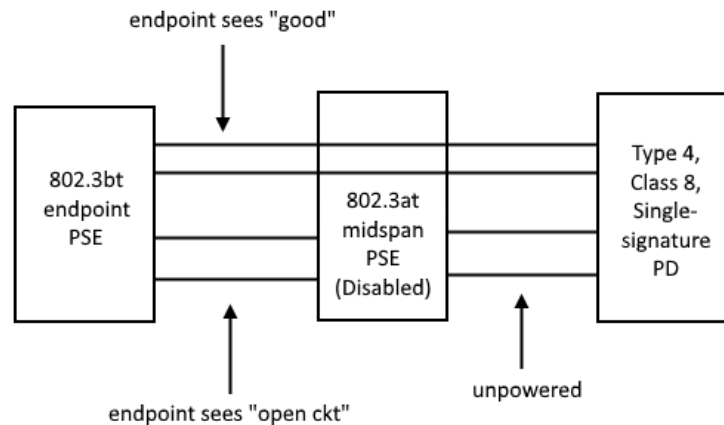


Figure 145B-11—PSE implementing **CC_DET_SEQ=3**, do_cxn_chk result is dual

Problem: Confounding CC, Detect Results

- **Why does it matter?**

- Consider the following scenario, utilizing compliant devices over a compliant link segment:



- Today, this “valid/invalid” combination may be interpreted as “sig_type = dual”, leading PSE SD to SISM state
 - In “SISM,” PSE will interpret this PD as dual-signature Class 5 (both utilize class_sig_a = 4, class_sig_b = 3)
- PSE issues 4 class events, allocating 45W to PD
- Single-signature PD interprets 4 class events as a demotion to 60W
- **This is an interoperability issue**

What does PSE Connection Check (“do_cxn_chk”) do?

- **DOES** identify mutual/isolated connection between Alternatives A, B.
- **DOES** obey detection electrical parameters (voltages, currents)
- **DOES NOT** identify detection signature (“sig_pri”, “sig_sec”)
 - But usage of “do_cxn_chk” result “sig_type” in PSE state diagram assumes knowledge of detection signatures

Conclusions

- **There is no problem** with performing Connection Check, Detection on both pairsets in any order, as long as timing and electrical requirements are obeyed
- **There is a problem** with “4-pair enabled” PSEs applying power to either pairset prior to performing Connection Check, Detection on **both** pairsets

Conclusions, cont'd

- Combination “valid/invalid” detection signatures are not defined single-signature or dual-signature PDs in Clause 145
- PSEs discovering these devices should...
 - Ultimately return to IDLE in 4-pair mode, and
 - Continue to be allowed to transition to 2-pair mode and power any valid pairset
 - e.g., return to IDLE, modify pse_alternative (A or B), proceed to power when valid detect signature found

Proposed Remedy

- Option 1: Wholesale fix PSE SD

- Adopt stover_02_0317_option1_baseline.pdf

- Introduces a flexible implementation of existing PSE cxn_chk, detection requirements (timing, electrical)
 - Enables implementations in Annex 145B that do connection check, detections prior to powering either pairset
 - Continues to allow PSEs to power valid pairsets of "valid/invalid" combinations as a 2 pair device (using "pse_alternative", A or B)
 - Allows SISMs to detect, classify simultaneously or staggered
 - Informs SISMs whether to initially re-detect or proceed to classification using existing tpon timers

- Option 2: Keep explicit “CC_DET_SEQ” logic in PSE SD

- Adopt stover02_0317_option2_baseline.pdf

- Includes related fixes for CC_DET_SEQ = 2
 - Adds a TDL to repair behavior in every CC_DET_SEQ