

# IEEE802.3bt Single Power PSE Rev 1.4

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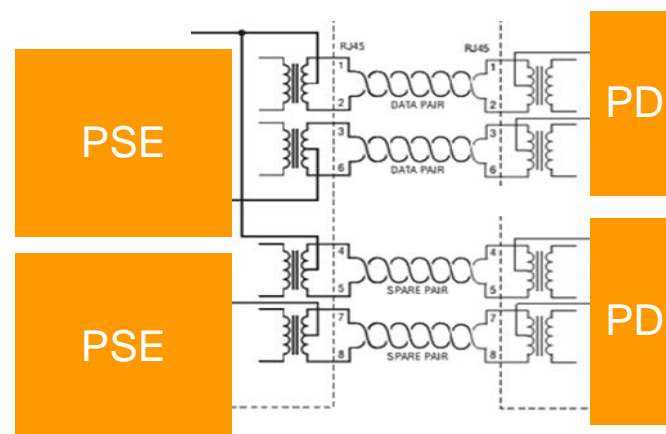
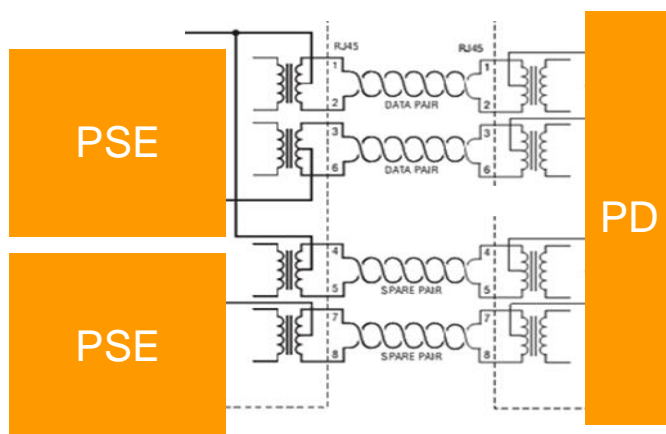
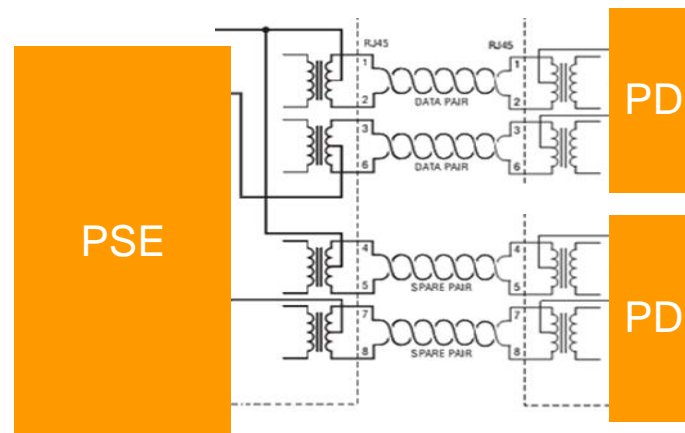
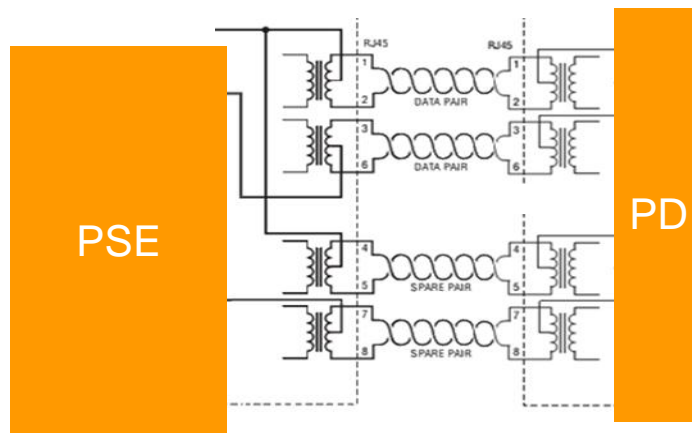


# Supporters

## Goal of this Presentation

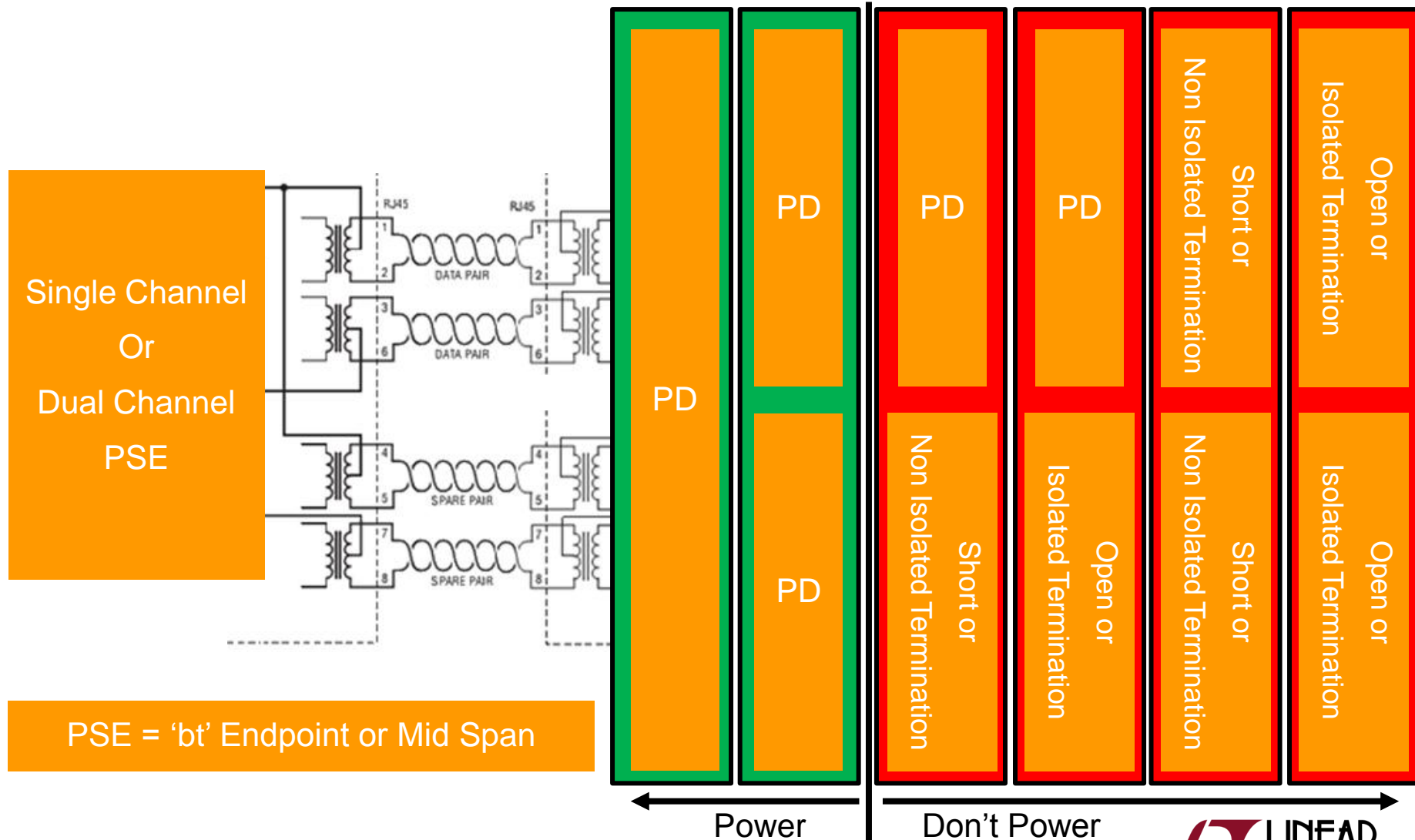
- Show Potential Dual and Single Power Channel PSE Scheme
- Highlight and address known concerns for both PSE configurations.
- Compare and contrast relative risks of Single vs Dual Power Channel PSEs

# PSE & PD Combinations We Have Agreed to Support in Beijing Straw Poll



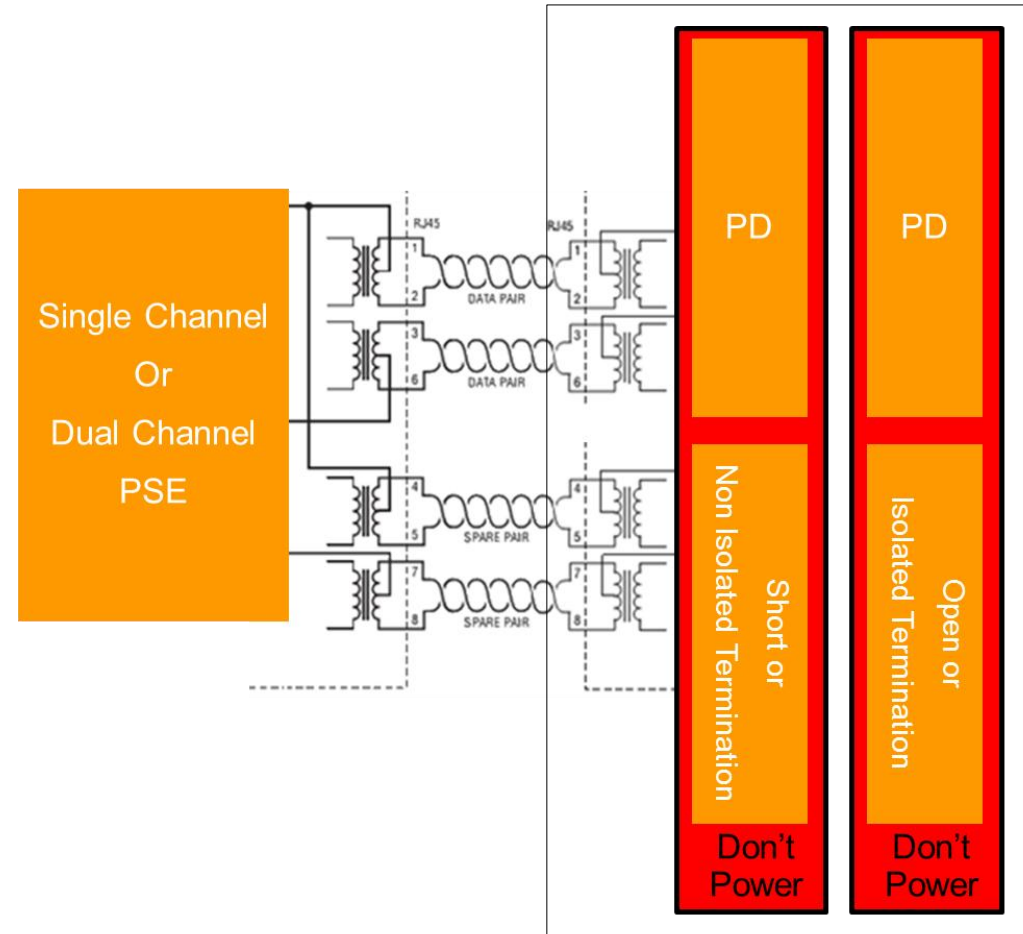
PSE = 'bt' Endpoint or Mid Span

# Possible Conditions from the PSE's View Normal Cable OR 'X' Cable or 'Y' Cable



# Why Should We Not Apply or Maintain Power in These Cases?

- These PDs are specifically not allowed by the standard.
- A 'bt' Endpoint could choose to become a Type 1 or Type 2 PSE and apply power to the DATA PAIRS



## 33.3.1 PD PI

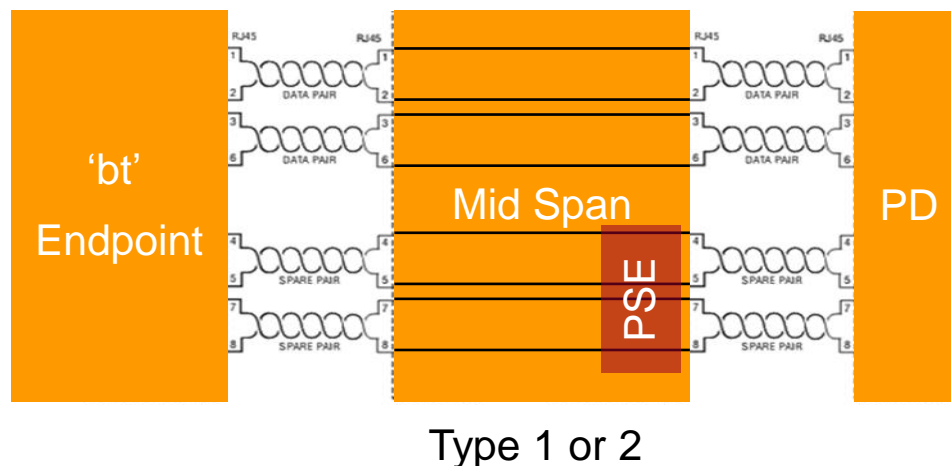
The PD shall be capable of accepting power on either of two sets of PI conductors. The two conductor sets are named Mode A and Mode B. In each four-wire connection, the two wires associated with a pair are at the same nominal average voltage. Figure 33-8 in conjunction with Table 33-13 illustrates the two power modes.

PSE = 'bt' Endpoint or Mid Span

NOTE—PDs that implement only Mode A or Mode B are specifically not allowed by this standard. PDs that simultaneously require power from both Mode A and Mode B are specifically not allowed by this standard.

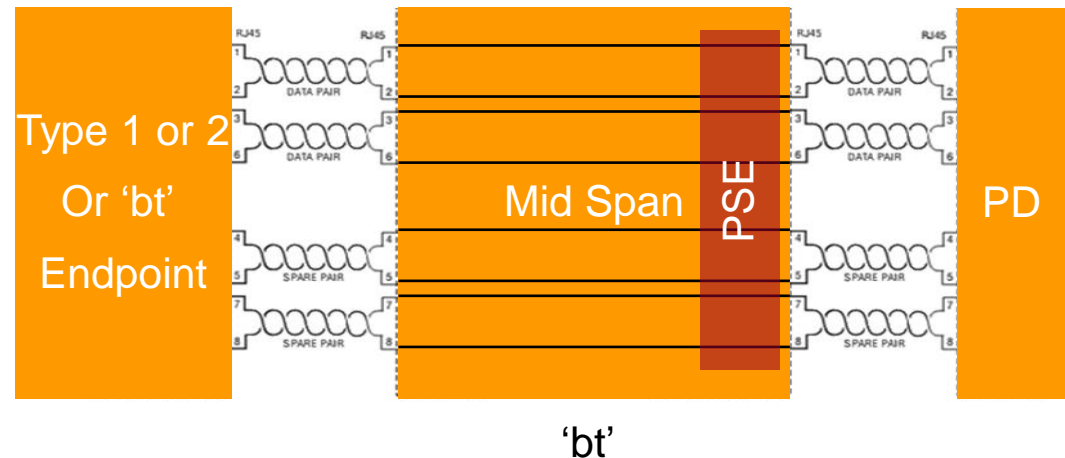
# Mid-Span Configurations and Suggested Powering Actions

- A 'bt' Endpoint cannot distinguish a Type 1 or Type 2 PD thru a Mid Span from a Mode A Only PD or Mode B Only PD
  - A 'bt' PSE should not deliver power in this case
  - *It should defer to the Mid Span*
- A 'bt' PSE Endpoint could choose to become a Type 1 or Type 2 PSE and apply power to the DATA PAIRS



# Mid-Span Configurations and Suggested Powering Actions

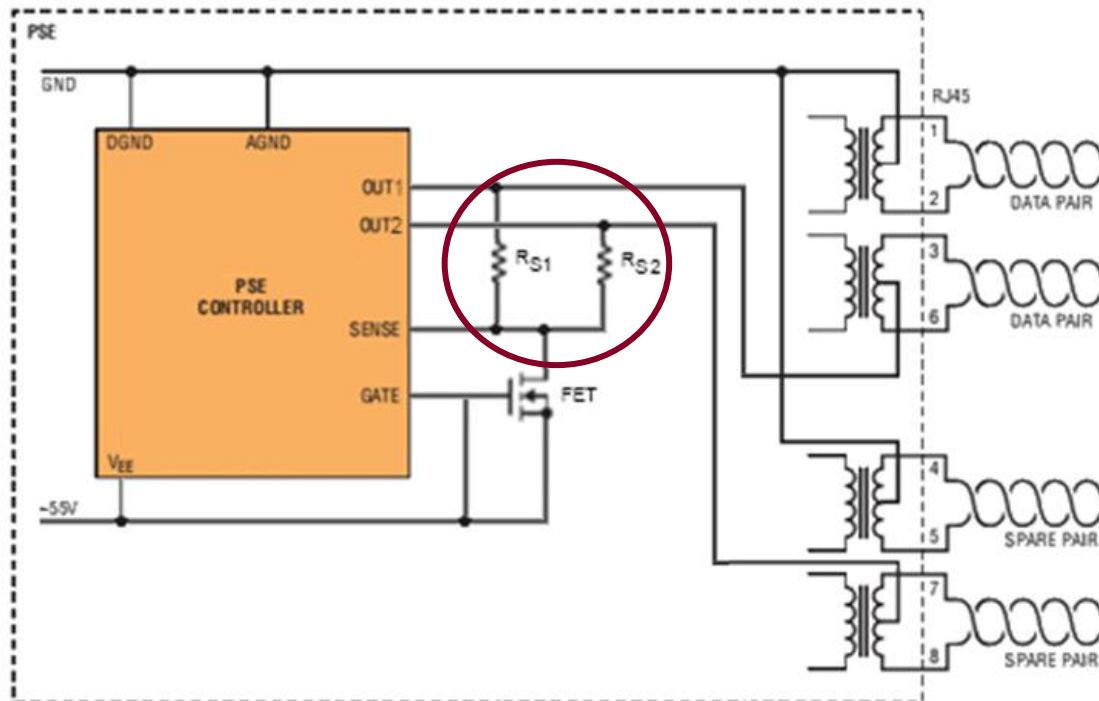
- All types of PSE Endpoints would not deliver power if they are blocked by a 'bt' Mid Span





# A Suggested PSE Single Channel Architecture

- Adds only two pins to each PSE IC per channel
  - One pin add anticipated to get to 0.1ohm anyway
  - One extra OUT pin



# Opportunities for detecting the special case of 'Y' cable No connection on one of the 2 pairs and a PD on the other.

- Detection?
  - Not enough current
  - $10V \text{ (Max)} / 33k\Omega \text{ (Max)} < 330\mu A$
  - Not practical w/o very large sense resistors which cause too much heat and loss of efficiency
- Class?
  - Enough current except for class 0 which can have 0mA
  - Class is a point where the new 'bt' classification can be helpful for mutual identification and will likely work for differentiating non-class0 PDs
- Power on phase – yes
  - Does not materially change risk over existing PSE systems

## Use Existing Detection to DC Disconnect Timing

- Maximum time to disconnect a PD after Detection is  $T_{pon} + T_{mpdo} = 0.4s + 0.4s = 0.8s$
- Thus a “powered” PSE cable can be reconnected to another device during this time:
  - Previous work showed a new PD can be swapped-in within 0.4s
  - This new device could be a new PD, NIC, or Y-cable and would be powered for 0.4s

18	PD Maintain Power Signature dropout time limit	$T_{MPDO}$	s	0.300	0.400	1, 2	See 33.2.9.
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## Use Existing Detection to DC disconnect timing

- We suggest a single power channel PSE can use this time to determine if there was a 'X' or 'Y' cable with an open circuit or other network device that has isolated termination resistors on one of the 2 Pairs
- A short circuit on alt A or alt B or non-isolated termination resistors would show up in detection

18	PD Maintain Power Signature dropout time limit	$T_{MPDO}$	s	0.300	0.400	1, 2	See 33.2.9.
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