Cl **33**   *SC* **33.2.4.4**   *P* **34**   *L* **28**   # 1
Zimmerman, George   CME Consulting

Comment Type **E**   *Comment Status* **X**

tinrush_timer, per table 33-11 is the timer to monitor the "per pair-set" inrush event. Although I can't find another tinrush, because it is mentioned prominently that it is a per pair-set inrush, it shoudl be mentioned here.

SuggestedRemedy

add "per pair-set" before "inrush event".

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6**   *P* **43**   *L* **33**   # 2
Zimmerman, George   CME Consulting

Comment Type **E**   *Comment Status* **X**

comma in place of "or" (precedent language is linked by an or

SuggestedRemedy

change "for two-pair, four-pair systems respectively" to read, "for two-pair or four-pair systems respectively".

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4**   *P* **19**   *L* **28**   # 3
Zimmerman, George   CME Consulting

Comment Type **ER**   *Comment Status* **X**

With deletion of "Type 1 and Type 2" the title, "System Parameters" is meaningless. the section more properly speaks to Types of PSEs

SuggestedRemedy

Rename section "Types of PSEs"

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4**   *P* **20**   *L* **4**   # 4
Zimmerman, George   CME Consulting

Comment Type **ER**   *Comment Status* **X**

Table 33-1 table needs reorganization and requires adition for Type 4 TBDs, and needs a more meaningful title than simply "System parameters"

SuggestedRemedy

See contribution for proposal - involves rotating the table (columns per parameter, rows for each type), adding TBDs for Type 4 items. Title would be PSE Types and Major System parameters

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **3.1.4**   *P* **20**   *L* **19**   # 5
Zimmerman, George   CME Consulting

Comment Type **ER**   *Comment Status* **X**

Term "per 2-pair" should be "per pair-set" as defined elsewhere, in note 1

SuggestedRemedy

Replace "2-pair" with "pair-set" in note 1

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4.1**   *P* **20**   *L* **46**   # 6
Zimmerman, George   CME Consulting

Comment Type **ER**   *Comment Status* **X**

TIA TR42.7 is updating TSB-184 to TSB-184A. Reference is or will be obsolete. (likely something similar has to happen for ISO)

SuggestedRemedy

Update reference to TSB-184A in anticipation or, add editors note to remind about updating.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **6**   Page 1 of 30
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Cl **33**   *SC* **33.1.4.3**   *P* **21**   *L* **24**   # 7
Zimmerman, George   CME Consulting

Comment Type **ER**   *Comment Status* **X**

NOTE is more properly an "Editors Note" - the text is not suitable for the final standard.

SuggestedRemedy

Make "NOTE" "Editor's note" (to be removed prior to publication).

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4**   *P* **28**   *L* **5**   # 8
Zimmerman, George   CME Consulting

Comment Type **ER**   *Comment Status* **X**

State diagrams are becoming a rats-nest. Need heirarchical structure to handle additions of 4pair ID, multiple classification methods, and class engines. The continuation of Figure 33-9 can be its own state machine

SuggestedRemedy

Restructure state machine in a hierarchical fashion, adding black box for 4-pair ID, and separating out classification branches shown on continuation of 33-9 as their own 'classification' state machine.
See contribution for proposal.

Change line 3 to read "Figure 33-9" and "33-10", deleting 33-9 continued, as this will be incorporated into 33-9 when the hierarchy is complete.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.4**   *P* **31**   *L* **29**   # 9
Zimmerman, George   CME Consulting

Comment Type **ER**   *Comment Status* **X**

pse_dll_capable interacts with allowable variations in Table 33-3 - needs a reference here and more description.

SuggestedRemedy

Insert after See 33.6, "for a description of Data Link Layer functionality and Table 33-3 for the allowed permutations of this variable with PSE Type and class_num_events."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.5**   *P* **39**   *L* **41**   # 10
Zimmerman, George   CME Consulting

Comment Type **ER**   *Comment Status* **X**

Is there also a "four-pair" detection? does the insertion relate to this, or is it trying to relate to the now-defined term, "pair-set". Clarify.

Also, note that the language really should refer to pair-sets SUCCESSFULLY used for detection, since invalid detections should not have power turned on.

SuggestedRemedy

Either - restructure section so there is clearly "two-pair detection" and "four-pair detection" (which I don't think is the aim), or
change to read, "The PSE shall turn on power only on the same pair-sets successfully used for detection."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.5.1**   *P* **39**   *L* **46**   # 11
Zimmerman, George   CME Consulting

Comment Type **ER**   *Comment Status* **X**

Informative illustrative embodiments should not interrupt the flow of normative requirements text, and

SuggestedRemedy

Move text beginning with "An illustrative embodiment" through "reveresed voltage PSE to PSE connection." (line 35 on page 40) after Table 33-4, and preferably preferably to an informative annex, labeled, "Examples of PSE Detection Source Circuits". (if moved to an informative annex, replacing the text with a simple, "Examples PSE detection source circuits may be seen in annex..." in place of the existing text.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.5.1**   *P* **41**   *L* **4**   # 12
Zimmerman, George   CME Consulting

Comment Type **ER**   *Comment Status* **X**

Are there also "four-pair" detection state requirements, or are these "per pair-set". Clarify.

SuggestedRemedy

Change title to "PSE PI per-pair-set detection state..."

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **12**   Page 2 of 30
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Cl **33**   *SC* **33.2.4.1**   *P* **28**   *L* **32**   # 13
Zimmerman, George   CME Consulting

Comment Type **T**   *Comment Status* **X**

"may" indicates an option, "may need" isn't proper standards language. The situation is to avoid excess voltages in fault and other conditions to maintain SELV complains.

SuggestedRemedy

replace "may need to have" with "should have". Delete "Type 1" from the start of the note - this applies to all PSEs and benefits not just safety but energy efficiency as well.

Proposed Response   *Response Status* **O**

Cl **01**   *SC* **1.4**   *P* **16**   *L* **13**   # 14
Zimmerman, George   CME Consulting

Comment Type **TR**   *Comment Status* **X**

Definition of pair-set is missing.

SuggestedRemedy

Insert definition of pair-set agreed in task force

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4.1**   *P* **20**   *L* **35**   # 15
Zimmerman, George   CME Consulting

Comment Type **TR**   *Comment Status* **X**

Title change makes section generic, yet the text doesn't apply to types 1 & 4

SuggestedRemedy

Change section title to read "Type 2 and Type 3 Cabling requirements"

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4.2**   *P* **21**   *L* **2**   # 16
Zimmerman, George   CME Consulting

Comment Type **TR**   *Comment Status* **X**

Title "Channel requirement" is misleading, and "channel" is not the 802.3 term. Additionally, unbalance requirements are now in an informative annex, and these would appropriately be there, since they reference cabling standards.

SuggestedRemedy

Move the content to Informative Annex 33A. Title it Intra-pair Resistance Unbalance. Reference TIA TSB-184A, TIA-568, and current versions of the ISO documents as appropriate for the requirements. (will gather appropriate references to contribute - not available at time of comment)

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.2**   *P* **22**   *L* **9**   # 17
Zimmerman, George   CME Consulting

Comment Type **TR**   *Comment Status* **X**

There are now several types of midpan PSE (the exact number depends on how you want to classify types, and isn't important - additionally the word "type" is defined and overused, so best to avoid)
We have added a 10GBASE-T midspan, which topologically, a 10GBASE-T Midspan PSE looks just like a 1000BASE-T midspan.
We have also added 4-pair powering (Type 3 and type 4?) midspans - whether these are Type 3 & Type 4 is

SuggestedRemedy

Change "two types" to "several variations", insert the following after 1000BASE-T Midspan PSE description:
"10GBASE-T Midspan PSE:
A Midspan PSE that results in a link that can support 10BASE-T, 100BASE-TX, 1000BASE-T and 10GBASE-T operation (see Figure 33-4)."
Modify title of Figure 33-4 to read "1000BASE-T or 10GBASE-T Midspan PSE location overview"

Then add the following Sentence:"Additionally, 1000BASE-T and 10GBASE-T Midspan PSEs" may be capable of 4-pair power (see Figure 33-5).

See contribution for figure 33-5 showing 4-pair PSE similar to Figure 33-4.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **17**   Page 3 of 30
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Cl **33**   *SC* **33.2.3**   *P* **27**   *L* **3**   # 18
Zimmerman, George   CME Consulting

Comment Type **TR**   *Comment Status* **X**

The definition of the PI shows an 8 pin modular jack, and assumes that it is the MDI defined for BASE-T PHYs, which is actually the title of the clause, but the clause doesn't actually specify that the 8 pin modular jack is the same MDI specified in the PHY clauses. It also needs to be updated to reflect 4 pair powering.

SuggestedRemedy

Insert the following before "A PSE may provide":
"A PSE device provides power over the PI. The PI shall be the 8 pin modular jack as connecting hardware as the MDI for highest common denominator PHY type supported (i.e., 10BASE-T, 100BASE-TX, 1000BASE-T or 10GBASE-T).
Rewrite the first 2 sentences to read:
"A PSE may provide power via one of two valid four-wire connections or all eight wires. In each connection, two conductors associated with a differential twisted pair for the PHY data transmission each carry the same nominal current in both magnitude and polarity."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.4**   *P* **29**   *L* **6**   # 19
Zimmerman, George   CME Consulting

Comment Type **TR**   *Comment Status* **X**

class_num_events has values restricted by certain types of PSEs. The information in Table 33-3 belongs here, or at least a reference to Table 33-3

SuggestedRemedy

Add the following text to each class description, after the existing sentence.
Value 0 - Allowed only for Type 1 PSEs.
Value 1 - Allowed for Type 1, 2, 3, and 4 PSEs. Only allowed for Type 1 or Type 4 PSEs if they are have pse_dll_capable = TRUE.
Value 2 - Allowed for Type 2 and 3 PSEs only.
Value 4 - Allowed only for Type 3 PSEs.
Value 5 - Allowed only for Type 4 PSEs.

Insert after class 5: The PSE shall obey, and meet at least one of allowed PSE variable definition permutations in Table 33-3.

Delete requirement on page 32, line 16 "PSEs shall meet at least one of the allowable variable definition permutations described in Table 33-3".

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.4**   *P* **33**   *L* **34**   # 20
Zimmerman, George   CME Consulting

Comment Type **TR**   *Comment Status* **X**

Notes to Table 33-3 are unclear. Are the notes intended to be restrictions on the use of the permutations for Type 3, class_num_events_1 & 2, with regards to pse_dll, or simply notes as to how they MAY be used?

Also, it is unclear from the notes, which relate to power, how these relate to the number of class events, as they do in the table.

Use of "can be limited" isn't proper standards language. It needs to be "may" (optional), "should" (recommended) or "shall" (requirement)

SuggestedRemedy

Replace "can be limited" in both notes, as appropriate:
If these are options, "may be limited" (may is the correct option word),
if these are recommended configurations "should be limited",
if these are requirements, "shall be limited".

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.7**   *P* **51**   *L* **47**   # 21
Yseboodt, Lennart   Philips

Comment Type **TR**   *Comment Status* **X**

Table 33-11, note at bottom.
"A Type 3 PSE that chooses to limit itself to Type 1 and Type 2 power levels may use Type 1 or Type 2 system parameters respectively".
This can be interpreted to apply to all system parameters, rather than the intended PType.

SuggestedRemedy

Replace note by: "A Type 3 PSE that is limited to Type 1 and Type 2 power levels may use Type 1 or Type 2 PType values."

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **21**   Page 4 of 30
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Cl **33**   *SC* **33.1**   *P* **17**   *L* **11**   # 22

Rimboim, Pavlick   Microsemi

Comment Type **E**   *Comment Status* **X**

missing "," after 25

"and the PHYs defined in Clause 25 Clause 40 and Clause 55. These entities allow devices to draw"

SuggestedRemedy

and the PHYs defined in Clause 25, Clause 40 and Clause 55. These entities allow

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4**   *P* **20**   *L* **7**   # 23

Rimboim, Pavlick   Microsemi

Comment Type **TR**   *Comment Status* **X**

table 33-1
type 4 4P or type 4 2P is missing

SuggestedRemedy

need to add either information or TBD in the table as place holder for Type 4 4P and type 4 2P

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4**   *P* **20**   *L* **26**   # 24

Rimboim, Pavlick   Microsemi

Comment Type **TR**   *Comment Status* **X**

"All four twisted pairs, connected from PSE PI to PD PI are required for Type 3 operation."

this ststaement is not true, for instance, you can have type 3 2P only, type 3 that uses the new MPS but uses only 30W 2P, with all the charecteristics meeting the 2P and type 3 requirements.

SuggestedRemedy

Type 3 system can use two twisted pair or 4 twisted pair

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.7**   *P* **72**   *L* **37**   # 25

Rimboim, Pavlick   Microsemi

Comment Type **TR**   *Comment Status* **X**

table 33-18
input power class 5 TBD PD type 3, assuming the power is 40-45W
it can be as well PD type 4 using 2P
but we need to differentiate between PD type 3 4P and type 4 2P

SuggestedRemedy

need to add another class level for PD type 4 2P supporting TBD power (40-45W)

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.7.1**   *P* **49**   *L* **16**   # 26

Rimboim, Pavlick   Microsemi

Comment Type **E**   *Comment Status* **X**

table 33-10
1st class event timing in this line is defined only for type 1 or 2

SuggestedRemedy

need to add in the additional information
"only applies to type 1 or type 2 PSE"

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6.2**   *P* **46**   *L* **34**   # 27

Rimboim, Pavlick   Microsemi

Comment Type **E**   *Comment Status* **X**

"based on the observed current according to Table 33–9a."
cant find table 33-9a, is the "a" a typo? or am i missing some table?

SuggestedRemedy

"based on the observed current according to Table 33–9."

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

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Cl **33**   *SC* **33.2.6.2**   *P* **46**   *L* **53**   # 28
Rimboim, Pavlick   Microsemi

Comment Type **E**   *Comment Status* **X**
"the observed current according to Table 33–9a."
same comment, cant find table 33-9a, is the "a" a typo?

SuggestedRemedy
"the observed current according to Table 33–9."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6.2**   *P* **46**   *L* **46**   # 29
Rimboim, Pavlick   Microsemi

Comment Type **TR**   *Comment Status* **X**
"Type 2 PSEs shall provide a maximum of 2 class and 2 mark events. Type 3 PSEs shall provide a maximum
of 4 class and 4 mark events. Type 4 PSEs shall provide a maximum of 5 class and 5 mark events."
we are missing class event for type 4 2P

SuggestedRemedy
we need to add 1 class event to cope with the missing type 4 2P.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6.2**   *P* **46**   *L* **20**   # 30
Rimboim, Pavlick   Microsemi

Comment Type **ER**   *Comment Status* **X**
"33.2.6.2 PSE 2-Event Physical Layer classification"
title is misleading, it is discussing multi event but the title is only 2 event

SuggestedRemedy
"33.2.6.2 PSE Multiple-Event Physical Layer classification"

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6.2**   *P* **46**   *L* **20**   # 31
Lukacs, Miklos   Silicon Labs

Comment Type **E**   *Comment Status* **X**
The tile is about 2-event classification

SuggestedRemedy
change the text:
"PSE 2-Event Physical Layer classification"
to:
"PSE Multiple-Event Physical Layer classification"

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6**   *P* **44**   *L* **15**   # 32
Lukacs, Miklos   Silicon Labs

Comment Type **E**   *Comment Status* **X**
This comment address Table 33-7.

The number is the brackets at Classes 5,6 and 7 should be described

SuggestedRemedy

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6**   *P* **45**   *L* **34**   # 33
Lukacs, Miklos   Silicon Labs

Comment Type **E**   *Comment Status* **X**
The new classes also should be mentioned

SuggestedRemedy
change the text:
"Valid classification results are Classes 0, 1, 2, 3, and 4, as..."
to
"Valid classification results are Classes from 0 to 7, as..."

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **33**   Page 6 of 30
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Cl **33**   *SC* **33.5.5.1**   *P* **69**   *L* **6**   *#* 34

Bennett, Ken   Sifos Technologies, In

Comment Type **E**   *Comment Status* **X**

The statement "The Physical Layer classification of the PD is the maximum power that the PD draws across all input voltages and operational modes." infers that a PD will actually draw the maximum power rather than fall into a range covered by the classification.

SuggestedRemedy

Change the statement to:
The Physical Layer classification of the PD conveys a maximum operating power that the PD will not exceed across all input voltages and operational modes.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.7**   *P* **72**   *L* **28**   *#* 35

Bennett, Ken   Sifos Technologies, In

Comment Type **ER**   *Comment Status* **X**

Table 33-18, item 4, The description "Input Average Power" in the Parameter column and the corresponding Symbol "PClass_PD" are not equivalent. A Parameter and a corresponding symbol should allow usage of either one without a change in meaning.

"Input Average Power" is an operating variable, whereas "PClass_PD" is a limit, and is used as a limit to describe other limits in the standard, such as PClass and Ppeak_PD.

SuggestedRemedy

In Table 33-18, Item 4, Parameter column, Change the 7 instances of:
 "Input Average Power, Class..."
to:
 "Maximum Input Average Power, Class..."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.7.2**   *P* **74**   *L* **7**   *#* 36

Bennett, Ken   Sifos Technologies, In

Comment Type **TR**   *Comment Status* **X**

PClass_PD needs a clearer, consistent description which takes the new rules into account. This comment focuses on 33.3.7.2, which is referred to under "additional information" for PClass_PD in Table 33-18. New text is suggested which relates to a separate submitted comment which changes the Table 33-18 Item 4 parameter column entries from "Input average power.." to "Maximum input average power...".

For reference, the following examples show inconsistent usage of "PClass_PD":
1) Described as power classification (Equation 33-3, pg 43, line 43)
2) An Average Power (Table 33-18, item 4, pg 72, Eq. 33-12 pg 75, ln 46)
3) A maximum power (33.3.7.2, pg 74, Ln 7, several other instances).
Additionally, the terms "PClass_PD" and "PClass_PD Max." are inconsistently used in specifying limits, such as PClass and Ppeak_PD.

SuggestedRemedy

Replace section 33.3.7.2 with:

33.3.7.2 Maximum input average power
PD maximum input average power shall not exceed PClass_PD. PClass_PD shall not exceed the Maximum PClass_PD for the Class. The Class shall be the lesser of:
a) the PD physical classification
b) the highest Class supported by pse_power_level in 33.3.6.
PDs may dynamically adjust PClass_PD below the Maximum PClass_PD of the Class as described in 33.6.
NOTE—Average power is calculated using any sliding window with a width of 1s.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Cl **33**   *SC* **33-11**   *P* **50**   *L* **13**   # 37

Bennett, Ken   Sifos Technologies, In

Comment Type **TR**   *Comment Status* **X**

In item 1a (VPort_PSE_diff) of table 33-11, the additional information section states "Open Load Voltage", while the parameter column states "POWER_ON" state. This is a problem because the POWER_ON state requires a load to stay powered. The load may be removed periodically in accordance with MPS timings, but periodic pulsing may 1) result in capacitive charges and discharges that disturb the Voltage measurement, and 2) it unnecessarily complicates the connection of an active test circuit which must also provide a true open load.

Additionally, an open load measurement provides no information about source resistance differences, and if series diodes are present, high resistance Voltage measurements may be heavily influenced by diode effective resistances in the absence of an attached load.

The suggested remedy provides a constant load to prevent PSE Power-down and isolates the loads by pairset to remove load unbalance influence.

SuggestedRemedy

Change Table 33-11, Item 1a, additional information column to:
Conditions: 10mA per pairset with two isolated loads.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **2.4.5**   *P* **34**   *L* **8**   # 38

Schindler, Fred   Seen Simply

Comment Type **TR**   *Comment Status* **X**

The name TLCF_TIMER is not correct in some locations. One version needs to be selected.

SuggestedRemedy

Scan for TCLF_TIMER and replace with TLCF_TIMER. ex. see line 13.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **2.5.1**   *P* **40**   *L* **4**   # 39

Schindler, Fred   Seen Simply

Comment Type **TR**   *Comment Status* **X**

The > 45 k-ohm value is missleading. The voltage source maximum is 30V. ISC < 30/45k = 0.7 mA but the requirement for ISC is 5 mA max. Therefore, Rseries may be less than 45k.

SuggestedRemedy

If there is no reason to show a 45k-ohm value remove the > 45k-ohm value and just show Zsource.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **2.6**   *P* **43**   *L* **32**   # 40

Schindler, Fred   Seen Simply

Comment Type **TR**   *Comment Status* **X**

Most requirements are specified on a pair-set bases. This text covers both a pair-set and two pair-sets in parallel. The text is not clear.

SuggestedRemedy

Replace "... and RChan = RCh max or RChan = RCh max/2 for two-pair, four-pair systems respectively and ..." with
"... and RChan = RCh max when powering using two-pairs, or RChan = RCh max/2 when powering using four-pair systems ..."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **2.7**   *P* **51**   *L* **18**   # 41

Schindler, Fred   Seen Simply

Comment Type **TR**   *Comment Status* **X**

Type-4 PSE will support the new DC MPS.

SuggestedRemedy

Add 4 to item 17, PSE Type column.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **41**   Page 8 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   12/16/2014 4:23:54 PM
SORT ORDER: Comment ID

Cl **33**   *SC* **2.7**   *P* **51**   *L* **32**   # 42
Schindler, Fred   Seen Simply

Comment Type **TR**   *Comment Status* **X**

Type 1 and 2 PD with a asserted 4PID may be powered using 4 pairs.

SuggestedRemedy

For item 20, add 1,2, to the PSE Type column, and add additional information, see xxxx when 4-pair powering. Where xxxx is section that covers when PDs may be 4-pair powered.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **3.4**   *P* **66**   *L* **51**   # 43
Schindler, Fred   Seen Simply

Comment Type **TR**   *Comment Status* **X**

The existing sentence needs to be adapated to support 4-pair powering.

SuggestedRemedy

Replace, "When a PD becomes powered via the PI, it shall present a non-valid detection signature on the set of pairs from which it is not drawing power."
with
"When a PD becomes powered via the PI, it shall present a non-valid detection signature on the set of pairs not requiring power. See xxxx for details on powering using 4 pairs."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **1.1**   *P* **17**   *L* **52**   # 44
Schindler, Fred   Seen Simply

Comment Type **TR**   *Comment Status* **X**

Type 4 is missing from c) Compatability.

SuggestedRemedy

See related comment for page 20 for a potential solution. i.e. reuse the suggested text.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **2.6.2**   *P* **49**   *L* **46**   # 45
Schindler, Fred   Seen Simply

Comment Type **ER**   *Comment Status* **X**

Althought I prefer using mV, mA, etc. the previous clause 33 Editor moved to standard units of V and A and writes 0.050 A rather than 50mA.

SuggestedRemedy

Determine what is allowed and stick with a consistent approach.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **3.1**   *P* **60**   *L* **9**   # 46
Schindler, Fred   Seen Simply

Comment Type **ER**   *Comment Status* **X**

I do not see a reason to create two names for the same electrical path. PSE use Alternative and PDs use Mode for the same path.

SuggestedRemedy

Replace Mode with Alternative in all text and tables. Confirm that no abiguity exists when doing the replacement.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **3.1**   *P* **60**   *L* **11**   # 47
Schindler, Fred   Seen Simply

Comment Type **ER**   *Comment Status* **X**

Remove extra .

SuggestedRemedy

Remove extra .

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **47**   Page 9 of 30
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Cl **33** *SC* **3.2** *P* **60** *L* **47** # 48
Schindler, Fred Seen Simply

Comment Type **ER** *Comment Status* **X**
Replace "... Type 1 Type 2, ..."

SuggestedRemedy
with "... Type 1, Type 2, ..."

Proposed Response *Response Status* **O**

Cl **33** *SC* **3.2** *P* **61** *L* **1** # 49
Schindler, Fred Seen Simply

Comment Type **ER** *Comment Status* **X**
Improve text by,
replacing "Type 3 PDs operating with a max power draw corresponding to Class 3 or less implement ..."

SuggestedRemedy
with "Type 3 PDs operating up to a max power draw corresponding to Class 3 implement ..."

Proposed Response *Response Status* **O**

Cl **33** *SC* **3.3.3** *P* **63** *L* **23** # 50
Schindler, Fred Seen Simply

Comment Type **ER** *Comment Status* **X**
Power values should not be placed in this section. This section should refer to the power values power class # variable name.

SuggestedRemedy
Replace power values with the approriate power class. ex. 15.4W may be replaced with class 0 or 3.

Proposed Response *Response Status* **O**

Cl **33** *SC* **3.3.5** *P* **66** *L* **9** # 51
Schindler, Fred Seen Simply

Comment Type **ER** *Comment Status* **X**
class_sig.3 is probably an error.

SuggestedRemedy
Use class_sig

Proposed Response *Response Status* **O**

Cl **33** *SC* **3.5.1** *P* **69** *L* **14** # 52
Schindler, Fred Seen Simply

Comment Type **ER** *Comment Status* **X**
The legacy sentence that has been adapted for .3BT, "Type 1 PDs may choose to implement a Multiple-Event class signature and return Class 0, 1, 2, or 3 in accordance with the maximum power draw, PClass_PD." is not clear.

What does this mean? i.e., when a PD chooses not to support Multiple-Events what does that mean?
1) Support one event and then cause a short is okay?
2) Support one event only and create espresso when subjected to second event?

SuggestedRemedy
Since a PD may or may not support multievent classification, stike the sentence. Or explain what the sentence means and potentially improve the sentence.

Proposed Response *Response Status* **O**

Cl **33** *SC* **3.5.2** *P* **70** *L* **26** # 53
Schindler, Fred Seen Simply

Comment Type **ER** *Comment Status* **X**
Improve the text, "... for the level defined in its pse_power_level state variable." be replcing it with

SuggestedRemedy
"... for the level defined in the pse_power_level state variable."

Proposed Response *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **53** Page 10 of 30
12/16/2014 4:23:54 PM

Cl **33**   *SC* **2.6**   *P* **44**   *L* **19**   # 54
Schindler, Fred   Seen Simply

Comment Type **T**   *Comment Status* **X**
The value 90W and probably 60W have not been established yet.

SuggestedRemedy
Replace at least 90W value with TBD.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **1.4**   *P* **20**   *L* **26**   # 55
Schindler, Fred   Seen Simply

Comment Type **TR**   *Comment Status* **X**
Explanitory text missing on +Icable and -Icable.

SuggestedRemedy
replace "... operation." with "... operation--two pair-sets each having one carrying (+Icable) and one carrying (-Icable), from the perspective of the PI.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **1.4.1**   *P* **20**   *L* **37**   # 56
Schindler, Fred   Seen Simply

Comment Type **TR**   *Comment Status* **X**
The cabling requirements for Type 4 operation are missing.

SuggestedRemedy
At line 48, add,
Type 3 operation requires TBD, or better cabling as specified in ISO/IEC 11801:TBD with the additional requirement that channel DC loop resistance shall be TBD ohms or less. These requirements are also met by Category TBD or better cable and components as specified in ANSI/TIA-568-C.2-TBD; or Category TBD
cable and components as specified in ANSI/TIA/EIA-568-A-TBD.

Under worst-case conditions, Type 4 operation requires a TBD °C reduction in the maximum ambient operating temperature of the cable when all cable pairs are energized at ICable (see Table 33–1), or a TBD °C reduction in the maximum ambient operating temperature of the cable when half of the cable pairs are
energized at ICable. Additional cable ambient operating temperature guidelines for Type 4 operation are provided in ISO/IEC TR 29125-TBD [B49]1 and TIA TSB-184-TBD[B60].

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **2.4.4**   *P* **33**   *L* **34**   # 57
Schindler, Fred   Seen Simply

Comment Type **TR**   *Comment Status* **X**
The text in Table 33-3 notes does not make sense without a formal definition of type.

This input is for the front matter.

SuggestedRemedy
Add definition for Type to 1.4.

Type 3 PD: A PD that provides a Class 5 and 6 signature during Physical Layer classification, understands multi-Event classification, and is capable of Data Link Layer classification (see IEEE 802.3, Clause 33).

Type 3 PSE: A PSE that supports both a Type 1, Type 2, and a Type 3 PD, and Type-3 MPS (see IEEE 802.3, Clause 33).

Type 4 PD: A PD that provides a Class 7 signature during Physical Layer classification, understands multi-Event classification, and is capable of Data Link Layer classification (see IEEE 802.3, Clause 33).

Type 4 PSE: A PSE that supports both a Type 1, Type 2, Type 3 and a Type 4 PD, and Type-3 MPS (see IEEE 802.3, Clause 33).

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.2**   *P* **G24**   *L* **46**   # 58
Feldman, Shahar   Microsemi

Comment Type **TR**   *Comment Status* **X**
"Figure 33-2 - 1000BASE-T Endpoint PSE location Overview" Missing 10GBASE-T reference

SuggestedRemedy
after the text "...1000BASE-T" add "/10GBASE-T"

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **58**   Page 11 of 30
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Cl **33**   *SC* **33.2.6.2**   *P* **47**   *L* **21**   # 59
Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

I could not find text that adresses the case of PSE Type 3 with Type 1 power level that is connected to PD Type 3 with Type 1 power level.
In this case when PSE want's to tell PD that he capable of support short MPS he send 85msec single event class.
If it is only single class even as in Type 1 PSE ,PD Type 3 can't remeber the tyming information.
As a result, we will be forced to use Type 3 PSE with Type 2 power level to power Type 3 PD with Type 1 power level because only with Type 2 power level we wil lhave mark events and PD can remeber timing information.
This will not be a cost effective system solution to use Type 3 PSE with type 2 power level to power Type 3 PD with type 1 power level.

In order to resolve this, we need to ask PSE Type 3 and 4 that supports only Type 1 power level, to support mark event until startup, after the single event 85msec class event.

SuggestedRemedy

To add text after line 21:
PSE Type 3 and 4 that supports only Type 1 power level shall support single class event with TLCF time duration following with mark event until thatwill last until startup per timings and voltage levels shown in table 33-9 and 33-10.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6**   *P* **44**   *L* **14**   # 60
Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

Table 33-7 desribes the following power levels that will be supported by PSE.
We are looking for system design flexibility and cost effectivnes of the design. It meas that we need to be able to support PSEs with half of the maximum of type 4 power and not force to use only 4P to deliver 40-50w power.

Type 1, 15W,   2P
Type 2, 30W,   2P
Missing (see below)
Type 3, 30W,   4P
Type 3, 45W,   4P
Type 3, 60W,   4P
Type 4, 90-100W(TBD)   4P

There is missing 45W or Type 4/2 over 2P that is required for cost effecting system flexibility and design.

SuggestedRemedy

To add to table 33-7 the requirement of half of Type 4 power over 2P as well.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6**   *P* **44**   *L* **19**   # 61
Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

The 90W supposed to be TBD.
We didn't agree yet of Type 4 maximum power.

SuggestedRemedy

Change the 90W or Ptype to TBD.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **61**   Page 12 of 30
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Cl **33**   *SC* **33.4**   *P* **78**   *L* **49**   # 62
Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

Missing 10GBaseT.
Change the text:
The requirements of 33.4 are consistent with the requirements of the 10BASE-T MAU and the 100BASETX and 1000BASE-T PHYs.

SuggestedRemedy

Change the text to:
The requirements of 33.4 are consistent with the requirements of the 10BASE-T MAU and the 100BASETX, and 1000BASE-T and 10GBaseT PHYs.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.7.7**   *P* **55**   *L* **27**   # 63
Darshan, Yair   Microsemi

Comment Type **ER**   *Comment Status* **X**

In drawing 33-14, at the 8.2msec point, there are vertical thick black marks on the numbers etc.

SuggestedRemedy

Remove these marks.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4.3**   *P* **21**   *L* **24**   # 64
Darshan, Yair   Microsemi

Comment Type **ER**   *Comment Status* **X**

The following text is not accurate:
"NOTE - The pair-to-pair resistance unbalance values are preliminary working numbers used for.."

We need the channel pair to pair resistance unbalance.
The channel is the cabling and connectors per TIA definition for a Channel or alternatively the P2P resistance unbalance from the face of the first equipment to the face of the end equipment or equivalent term but it cannot be cable+cordage only.

SuggestedRemedy

Change to:
NOTE - The channel pair-to-pair resistance unbalance values are preliminary working numbers used for characterizing cabling while awaiting input from ISO/IEC SC25 (developing the second edition of ISO/IEC TR 29125) and TIA TR42 (developing a revision of TIA TSB-184). These groups have works in progress
that are expected to include channel pair-to-pair resistance unbalance specifications suitable for reference.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **64**   Page 13 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   12/16/2014 4:23:54 PM
SORT ORDER: Comment ID

Cl **33**   *SC* **33.2.7.4**   *P* **52**   *L* **42**   # 65

Darshan, Yair   Microsemi

Comment Type **T**   *Comment Status* **X**

Equation 33-4 need to be updated to (1+K)*{Main equation body} and K gets different meaning now (instead of additional current it will be a number related to P2P system unbalance that will increase the old Ipeak_2P equation if 4P system is used.
See details in the attached file "darshan_D0.2_Equation 33-4".
The proposal is equivalent to the intent in the current draft however after defining K it will be easier to use in the proposed new form since we know what is K.

SuggestedRemedy

Updated Equation 33-4 as follows:
Ipeak_2p=(1+K)*{Equation 33-4 per IEEE802.3-2012}.
For 2P systems: K=0
For 4P systems: K= (TBD). K is the factor due to system end to end pair to pair unbalance effect.

Note:
K is the value that will generates max{ E2EP2PRunb*Ipeak} and will be defined in Table/clause TBD).

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.5**   *P* **71**   *L* **5**   # 66

Darshan, Yair   Microsemi

Comment Type **T**   *Comment Status* **X**

The DO_CLASS_EVENT_6 is missing from line 5 per the current state diagram that is required to have a defined state after maximum class events per PSE type was used.:
VMark_th is the PI voltage threshold at which the PD implementing 2Multiple-Event class signature transitions into and out of the DO_CLASS_EVENT1, or DO_CLASS_EVENT2, DO_CLASS_EVENT3, DO_CLASS_EVENT4 or DO_CLASS_EVENT5 states as shown in Figure 33–16.

SuggestedRemedy

Change to:
VMark_th is the PI voltage threshold at which the PD implementing 2Multiple-Event class signature transitions into and out of the DO_CLASS_EVENT1, or DO_CLASS_EVENT2, DO_CLASS_EVENT3, DO_CLASS_EVENT4,or DO_CLASS_EVENT5 or DO_CLASS_EVENT6 states as shown in Figure 33–16.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.7**   *P* **72**   *L* **19**   # 67

Darshan, Yair   Microsemi

Comment Type **T**   *Comment Status* **X**

Table 33-18 item 1:
Type 4 minimum input voltage is:
1. Maximum PSE power is 100W.
2. Using 5% maging to limit power to 95W. (easy to measure power with 5% accuracy etc. and not leaving unused power on the table)
3. 95W at PSE sets total 95/50/1.9A over all 4P. 0.95A nominal per pair ignoring P2PRUNB effect that will be adessed in different comment.
4. Channel is 12.5 ohm/pair, 6.25 ohm / 4P.
5. Vpd=50V-6.25 ohm *1.9A=38.125V ==> 38V.

6. Maximum value stays 57V. (No other choice..)

SuggestedRemedy

Change TBD Vmin to 38V(TBD).
Change TBD Vmax to 57V max.

Note: To adjust this number after finalyzing Type 4 PSE maximum power and system unbalance at Type 4 power levels which will be lower than Type 3 system at maximum power.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.7**   *P* **49**   *L* **46**   # 68

Darshan, Yair   Microsemi

Comment Type **T**   *Comment Status* **X**

Table 33-11 item 1a, Output Voltage pair to pair difference.
Current survay shows that 2mV(TBD) maximum is supported by by some PSEs.

Adding some margin of 0.5mV may cover all our needs.
Still waiting for more data from other vendors however it is worth to specify number and get comments on it.

SuggestedRemedy

Change TBD maximum value to 2.5mV(TBD).

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID   *Comment ID* **68**   Page 14 of 30
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Cl **33**	*SC* **33.2.6**	*P* **43**	*L* **37**	# 69

Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

Equation 33-3 is correct for 2P operation:
We need to plug into Equation 33-3 the effect of system pair to pair unbalance resistance/current unbalance, or to add the factor needed to increase PSE power to compensate for PSE PI, PD PI and Cable for losses caused by system unbalance that is higher than only channel unbalance.
(Channel unbalance <=7.5%. System unbalance could be 20-40% worst-case).
If total end to end unbalance =channel unbalance then the power loss on cable will be less or equal than perfectly balance channel. This was demonstrated in my previous work. As a result Eq-33 will not change. BUT THIS IS NOT THE CASE NOW. We done with the channel and now we check the system.
The system unbalance will create extra power loss on the channel and PSE PI and PD PI that will need to be delivered from the PSE.
As a result equation 33-3 needs to be multiplied by (1+alfa).

(alfa is a factor that takes the system max/min currents at system unbalance multiply it with max/min end to end resistive components, and subtract the power loss in perfectly balanced system).
Alfa need to be quantified and work is in progress.

SuggestedRemedy

1. Multiply right side of Equation 33-3 by a factor of (1+alfa).
2. Add the following text after line 43:
alfa=0 for PSEs that are delivering power over one pair-set only.
alfa=TBD for PSEs that are delivering power over both pair-sets.

Proposed Response   *Response Status* **O**

Cl **33**	*SC* **33.3.3.3**	*P* **62**	*L* **52**	# 70

Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

The TRUE part of the variable present_det_sig should be per pair-set for Type 3 and 4 PDs if PD advertize that it require power over each pair-set.

SuggestedRemedy

Change the following text from:
TRUE:A valid PD detection signature is to be applied to the link.
To:
TRUE:A valid PD detection signature is to be applied to the link over each pair_set.

(Note: This is actually covers all PD types. The idea is the at the PI we will see valid signature over each pair as we had in type 1/2 PD when power was not simultaneously supplied)

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **70**   Page 15 of 30
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Cl **33** *SC* **33.3.35** *P* **66** *L* **35** # 71

Darshan, Yair Microsemi

Comment Type **TR** *Comment Status* **X**

The text "NOTE 1—DO_CLASS_EVENT63 creates a defined behavior for a Type 2, Type 3 and Type 4 PD that is brought into the classification range repeatedly."
Is not clear and the intent of it was"
After the relevant maximum class event that is related to the PSE type, if we get more class events then, any aadditional class event will not change the PD final number of events i.e. PD events counter is locked until PD reset state.

SuggestedRemedy

Change the following text:
NOTE 1-DO_CLASS_EVENT6 creates a defined behavior for a Type 2, Type 3 and Type 4 PD that is brought into the classification range repeatedly.

To:
NOTES:
A) 1-DO_CLASS_EVENT 6 creates a defined behavior for a Type 4 PD that is brought into the classification range repeatedly.
B) 1-DO_CLASS_EVENT 5 creates a defined behavior for a Type 3 PD that is brought into the classification range repeatedly.
C) 1-DO_CLASS_EVENT 3 creates a defined behavior for a Type 2 PD that is brought into the classification range repeatedly.

Alternative remedy would be to update state machine accordingly in similar way that we did in 802.3-2012 state machine for type 2 with class event 3 and in this draft for Type 4 with the class event 6.

Proposed Response *Response Status* **O**

Cl **33** *SC* **33.3.7** *P* **72** *L* **38** # 72

Darshan, Yair Microsemi

Comment Type **TR** *Comment Status* **X**

Table 33-18 item 4 Class 5, 6 and 7:
1. For Class 5 Type 3 PD, the PD power can be 45W including the P2P unbalance effect for CAT5e and better cables. (It is less that 51W PD...)
1.1 No P2P unb issues at this power level.
It is suggested to change from TBD to 39.9W (calculated 39.93W).

2. For class 6 Type 3 PD, per the research of the E2ECP2PRUN adhoc for Type 3 PD the PD power can be 51W including the P2P unbalance effect when used with CAT5e cabling or better.
2.1 The objective was to support 49W.
2.2 The actual (and worst case system unbalance) at long and short channel allows Supporting 51W.
2.3 It is suggested to change from TBD to 51W(TBD) and get comments towards the next draft.
3. Per research done few years ago and addressed in one of the comments here, we can source 45W per pair-set (total 95W) with CAT5e cable for 22 cables in a bundle and of the same power with 100 cables per bundle with CAT_XXX cable, as a result we can support load of 72.44W. It will create total of 1.9A over 4Pairs.
3.1 E2ECP2PRUN system E2E P2PRUNB is improved when load power is increased.
3.2 95W is easy to measure and limit in term of measurement accuracy. It is 5W away from the maximum allowed maximum of 100W so we are not leaving unused power on the table.
3.3 It is suggested to change from TBD to 95W (TBD) and get comments for the next draft for the following tests/calculations:
a) Maximum pair current at power at 95W load.
b) Cable loss with end to end P2PCTUNB.
c) The effect of (a) and (b) on final total PD power i.e. can we support 95W including all effects.
Working on the above will finalize that number.

4. PD input voltage for Type 4 PD during overload and normal operation will be addressed in different comment.

SuggestedRemedy

Table 33-18:
Change Item 4 in Table 33-18 as follows:
1. Type 3 Class 5: Change from TBD to 39.9W
2. Type 3 Class 6: Change from TBD to 51W(TBD)
3. Type 4 Class 7: Change from TBD to 95W(TBD)

Proposed Response *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

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Cl **33**   *SC* **33.3.7**   *P* **72**   *L*   # 73

Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

Table 33-18 item 3: Input voltage range per pair-set during overload.
Due to the fact that we are not allowed to consume more than 100W from the PSE and per my previous comment we want PSE to support 95W, so overload in terms of power can be only 5W more, I am reccomending the following:
During Type 4 Overload conditions:
1.PSE port power maximim is 100W.
1.1 No need to measure it and police it since PD is resposible to meet it.
1.2 PSE port power need to be 95W average or Rms in any case per current specification which must be guranteed by PD overload current peak for 50msec max and 5% duty cycle.
2. As a result PD peak power during overload is 75W max.
3. Total 4P current is 2A max.
4. Resulting with Vpd minimum of 37.5V.

SuggestedRemedy

Change Table 33-18 item 3 TBDs to:
Vin min: 37.5V(TBD).
Vin max: 57V max. (No other choice).

Note: To adjust this number after finalizing Type 4 PSE maximum power and system unbalance at Type 4 power levels which will be lower than Type 3 system at maximum power.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.7.2**   *P* **49**   *L* **50**   # 74

Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

The subject is: Voltage transient related to Table 33-11 item 2:
In the current spec., the transient is defined as percentage from Vpse_min.
The intent of the specification was to identify PSE voltage drop due to transient for the defined time duration (due to transient, overload etc.) which is a clear sign for overload.
Technically the correct definition is 7.6% of the actual PSE voltage at POWER_ON state.
The intent of the above was to allow operation under transient conditions without requiring costly power supply and components over-stress.
As a result, technically and physically, the actual PSE voltage at power on state when loaded and voltage drops below the 7.6% of Vpse, it is overload/transient condition as well.
In type 3 and Type 4 systems were we need bigger power supplies, defining 7.6% from from actual VPSE at POWER_ON state is better than 7.6% from VPSE_min only.
So it is proposed to support both options.

SuggestedRemedy

Change 33.2.7.2 from:
"A Type 2 PSE, Type 3 PSE and Type 4 PSE shall maintain an output voltage no less than KTran_lo below VPort_PSE-2P_min or below VPort_PSE-2P actual voltage during POWER_ON state for transient conditions lasting more than 30us and less than 250us,and meet the requirements of 33.2.7.7."

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **74**   Page 17 of 30
12/16/2014 4:23:54 PM

Cl **33**   *SC* **33.2.7**   *P* **51**   *L* **16**   # 75

Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

Table 33-11, item 17, DC MPS current for Type 3.
Due to pair to pair unbalance at low current (mA current range), we need to reduce the minimum value of the MPS current from 5mA to 2mA.
(Note: System unbalance is decresed at high current and increase at low current. It is due to the PD diode phisics.
(The current unbalance is further increased for much lower current than few houndered uA range. Moreover it is more sensitive to temperature unbalance, thermal instability etc.due to the fact that we are at the diode dark current region=reverse current so staying above 1mA for MPS is a good choice and it is not recomended to go below 1mA.)
Using 2mA as minimum, will keep backwards competability for all PSE types due to the fact that PSE vendor can now set his thresholds for disconnect at any number between 2mA to 10mA instead of 5mA to 10mA. This allows more design flexibility when we work with 4P systems.

This is not the only topic required to be adressed for DC MPS current at unbalance conditions,and other nessasry means will be adressed in different comments to adress different system architectures.

SuggestedRemedy

1. Table 33-11, item 17, DC MPS current for Type 1 and 2:
Change DC MPS minimum threshold value from 5mA to 2mA.
2. Table 33-11, item 17, DC MPS current for Type 3 and 4:
Set DC MPS minimum threshold value to 2mA.
3. Table 33-11, item 17, DC MPS current for Type 3 and 4:
Set DC MPS max threshold value to 20mA (TBD).

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.7**   *P* **37**   *L* **23**   # 76

Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

A1 Exit is missing.
A1 is required for page 38 that continuing the state diagram.
A1 is exists at page 38 but not at Page 37.

SuggestedRemedy

Add exit A1 from DETECT_EVAL state.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.7**   *P* **73**   *L* **20**   # 77

Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

Table 33-18 item 7, Peak operating power Class 7.
To limit PSE port maximum power to 100W at worst case channel resistance conditions, Ppeak_PD must be 75W max under.
(72.44W max for PSE port power=95W)

SuggestedRemedy

1. Change Table 33-18 item 7, Peak operating power Class 7 TBD to: 75W.
2. In clause 33.3.7.4 page 75 line 42 equation 33-12:
Add text after the equation saying that for class 7 PD, Ppeak_PD=75W max.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.8**   *P* **78**   *L* **11**   # 78

Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

To replace MPS current TBD to 20mA at following text:
b) Current draw equal to or above TBD mA for a minimum duration of 7 ms, measured with a series resistance representing the worst case cable impedance between the measurement point and the PD"
Rationel:
1. Helps handling short pulse duration 7msec (compared to 75msec that we had) when detected at the PSE after pulse is filtered at PD with its large input cap.
2. Compenstae for high system unbalance at low currents which will reduce current seen by PSE compared to the other pair.

SuggestedRemedy

Change TBD to 20mA.

Note:
Aafter finalyzing system P2P unbalance, we may need to adjust this number .

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **78**   Page 18 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   12/16/2014 4:23:54 PM
SORT ORDER: Comment ID

Cl **33**   *SC* **33.1.4**   *P* **20**   *L* **6**   # 79
Darshan, Yair   Microsemi

Comment Type   **TR**   *Comment Status* **X**

Table 33-1:
We would like that the 802.3bt will support two cabling concepts for Type 4 systems.
a) CAT5e infrastructure as it is done today by pre-standard solutions.
There is a research done to establish maximum number of cables per bundle for different maximum pair current in 4P systems and for different cable types.
See details in page 18 at http://www.ieee802.org/3/bt/public/jan14/maguire_1_0114.pdf.

b) A bundle of 100 cables with Type that can allow it.
As a result, the following is a proposal for revising Table 33.1 to include information and values for Type 4 systems regarding:
-Number of cables per bundle when using CAT5e cables.
-New cable type when using 100 cables in a bundle.
-Nominal highest DC current per pair.
-Total current of all pairs at the same cable in 4P system when P2P current unbalance is exists.

SuggestedRemedy

See Attached "darshan_D0.2_New Table 33-1" proposal.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4**   *P* **20**   *L* **26**   # 80
Darshan, Yair   Microsemi

Comment Type   **TR**   *Comment Status* **X**

In the current text
"All four twisted pairs, connected from PSE PI to PD PI are required for Type 3 operation."
a) Type 4 is missing.
b) In addition, Type 3 and Type 4 system may use all 4P or will use only two pairs for delivering half of the possible maximum power.
This is required to optimize system design flexibility and cost.
So we need to allow systems that are 2P 0.5*Type 4 power and Type 4 power same way we do with Type 2 power and 2xType 2 power=Type 3 power
We have different markets and applications and optimized cost and space is important requirement.

SuggestedRemedy

Change from
"All four twisted pairs, connected from PSE PI to PD PI are required for Type 3 operation."
To:
"All four twisted pairs, connected from PSE PI to PD PI are required for Type 3 and Type 4 operation. For Type 3 or Type 4 operation that uses to deliver half of its maximum type power level, two twisted pairs may be used."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.2**   *P* **22**   *L* **19**   # 81
Darshan, Yair   Microsemi

Comment Type   **TR**   *Comment Status* **X**

In 33.2.2 Midspan PSE types, the text for 10G need to be included.

SuggestedRemedy

Add the following text after line 19:
10GBASE-T Midspan PSE:
A Midspan PSE that results in a link that can support 10BASE-T, 100BASE-TX, 1000BASET and 10GBaseT operation (see Figure TBD).

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **81**   Page 19 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   12/16/2014 4:23:54 PM
SORT ORDER: Comment ID

Cl **33**　　*SC* **33.2.2**　　　　*P* **26**　　　*L* **53**　　　# 82
Darshan, Yair　　　　　　　　　Microsemi

Comment Type　**TR**　　*Comment Status*　**X**

Missing drawing for:
- 10/BASE-T/100BASE-TX Alternative A and Alternative B Midspan PSE

- 1000BASE-T/10GBaseT Alternative A and Alternative B Midspan PSE

SuggestedRemedy

Add Missing drawing for:
- 10/BASE-T/100BASE-TX Alternative A and Alternative B Midspan PSE
- 1000BASE-T/10GBaseT Alternative A and Alternative B Midspan PSE

See attached "darshan_D0.2_Midspan drawings" file.

Proposed Response　　　*Response Status*　**O**

Cl **33**　　*SC* **33.2.4.1**　　　*P* **28**　　　*L* **21**　　　# 83
Darshan, Yair　　　　　　　　　Microsemi

Comment Type　**TR**　　*Comment Status*　**X**

The Backoff time Tdbo algorithm is not required for 4P systems.

SuggestedRemedy

Add the following text after line 25:
A Type 3 or Type 4 PSE that is delivering power over Altenative A and Alternative B pairs
is not required to meet backoff algorithm.

Proposed Response　　　*Response Status*　**O**

Cl **33**　　*SC* **33.2.4.4**　　　*P* **28**　　　*L* **3**　　　# 84
Darshan, Yair　　　　　　　　　Microsemi

Comment Type　**TR**　　*Comment Status*　**X**

Subject: State machine
The specifications say:
"The PSE shall provide the behavior of the state diagrams shown in Figure 33-9, Figure 33-9 continued, and Figure 33-10."
The state machine has priority over text.
In IEEE802.3-2012, we had only 2pairs as a result the state machine was addressing Alternative A pairs or Alternative B pairs and not both.
for 802.3bt we need to specify that the state machine specify the behavior and the requirements when operating over each pairs set; Alternative A pairs and Alternative B pairs.

SuggestedRemedy

Add the following text before figure 33-9:
"The following state machine shall be met over each pair-set."

Proposed Response　　　*Response Status*　**O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **84**

Page 20 of 30
12/16/2014 4:23:54 PM

Cl **33**   *SC* **33.2.4.4**   *P* **30**   *L* **33**   # 85

Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

Subject: ovld_detected
The overload needs to be monitored over each pair set.
The current text doesn't say it:
"ovld_detection
A variable indicating if the PSE output current has been in an overload condition (see
33.2.7.6) for at least TCUT of a one second sliding time.
Values: FALSE:The PSE has not detected an overload condition.
TRUE: The PSE has detected an overload condition."

SuggestedRemedy

Change to:
"ovld_detected
A variable indicating if the PSE output current has been in an overload condition (see
33.2.7.6) for at least TCUT of a one second sliding time.
Values: FALSE:The PSE has not detected an overload condition.
TRUE: The PSE has detected an overload condition in a pair set"
----- --------------------------------

Note: The above is not addressing what to do with this information. It is ensures that we
will have information about overload per pair set.
Other text/state machine will address the question what to do with the information.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.4**   *P* **31**   *L* **3**   # 86

Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

Subject: power_applied variable.
The following text is not completed for supporting both 2P and 4P systems.
It says:
"TRUE:The PSE has begun steady state operation.".
It is possible that on one pair set, the PSE has begun steady state operation and on the
2nd pair set it is not when it is Type 3 and 4 PSEs.

SuggestedRemedy

Change to:
"TRUE:The PSE has begun steady state operation over the sucssesfuly detected pair set."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.4**   *P* **30**   *L* **48**   # 87

Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

Subject: pi_powered variable.
The following text is not completed for supporting both 2P and 4P systems.
It says:
"TRUE:The PSE has detected a PD, classified it if applicable, and determined the PD is to
be powered; or power is being forced on in TEST_MODE."
It needs to reflect that pi_powered is True when the above conditions are satisfied over 2P
in Type 1 and 2 systems, and satisfied over each pair set for type 3 and 4 system.

SuggestedRemedy

Change to:
"TRUE:For Type 1 PSE and Type 2 PSE, the PSE has detected a valid PD, classified it if
applicable, and determined the PD is to be powered; or power is being forced on in
TEST_MODE.
For Type 3 PSE and Type 4 PSE, the PSE has detected a valid PD over each pair set,
classified it if applicable, and determined the PD is to be powered; or power is being forced
on in TEST_MODE.".

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.4**   *P* **32**   *L* **12**   # 88

Darshan, Yair   Microsemi

Comment Type **TR**   *Comment Status* **X**

Subject: short_detected.
The following text is not completed for supporting both 2P and 4P systems.
It says:
"TRUE:The PSE has detected qualified short circuit condition."
It needs to reflect that short circuit condition is monitored and supported for each air set
when operating 4P system.

SuggestedRemedy

Change to:
"TRUE:The PSE has detected qualified short circuit condition over a pair set."
----- --------------------------------

Note: The above is not addressing what to do with this information. It is ensures that we
will have information about short circuit per pair set.
Other text/state machine will address the question what to do with the information.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **88**   Page 21 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   12/16/2014 4:23:54 PM
SORT ORDER: Comment ID

Cl **33**　　*SC* **33.2.4.6**　　　*P* **35**　　*L* **22**　　# 89
Darshan, Yair　　　　　　　Microsemi

Comment Type **TR**　　*Comment Status* **X**

The following text regarding do_detection function is not complete to support 4P systems.
"do_detection
This function returns the following variables:
signature:
This variable indicates the presence or absence of a PD.
Values: open_circuit:The PSE has detected an open circuit. This value is optionally
returned by a PSE performing detection using Alternative B.
valid: The PSE has detected a PD requesting power.
invalid: Neither open_circuit, nor valid PD detection signature has been found.

mr_valid_signature:
This variable indicates that the PSE has detected a valid signature.
Values: FALSE: No valid signature detected.
TRUE: Valid signature detected."

It is required to modify it to support 2P and 4P systems per our previous motions and
discussions.

SuggestedRemedy

To change the text to:
"do_detection
This function is performed by the PSE over the pair-set that is going to be powered.
This function returns the following variables:
signature:
This variable indicates the presence or absence of a PD.
Values: open_circuit: The PSE has detected an open circuit. This value is optionally
returned by a PSE performing detection using Alternative B.
 In addition, when Type 3 PSE and Type 4 PSE that are required to perform detection over
each pair set, has detected open_circuit over one pair set or both.
valid: For Type 1 PSE and Type 2 PSE:The PSE has detected a PD requesting power.
For Type 3 PSE and Type 4 PSE: The PSE has detected a PD requesting power over
Alternative A pairs or PD requesting power over Alternative B pairs or PD requesting power
over both Alternative A and Alternative B.
invalid: Neither open_circuit, nor valid PD detection signature has been found.

mr_valid_signature:
This variable indicates that the PSE has detected a valid signature over the pair set that is
going to be powered.
Values: FALSE: No valid signature detected.
TRUE: Valid signature detected."

Proposed Response　　　*Response Status* **O**

Cl **33**　　*SC* **33.2.5**　　　*P* **39**　　*L* **29**　　# 90
Darshan, Yair　　　　　　　Microsemi

Comment Type **TR**　　*Comment Status* **X**

The following text is not complete when 4P systems are involved:
"In any operational state, the PSE shall not apply operating power to the PI until the PSE
has successfully detected a PD requesting power."

The issue is that a PD may be connected to the PI but there is valid signature only on one
of the pair-sets due to any possible wiring fault, bad connection etc.

SuggestedRemedy

Change to:
"In any operational state, the PSE shall not apply operating power to the PI until the PSE
has successfully detected a PD requesting power over one pair-set for Type 1 and Type 2
PSE and over both pair-set for Type 3 PSE and Type 4 PSE."

Proposed Response　　　*Response Status* **O**

Cl **33**　　*SC* **33.2.7**　　　*P* **49**　　*L* **43**　　# 91
Darshan, Yair　　　　　　　Microsemi

Comment Type **TR**　　*Comment Status* **X**

Table 33-11 item 1 PSE Type 4.
PSE minimum voltage and maximum voltage can't be different from Type 3.
a) 50V to 57V is cost effective power supply operatingrange.
b) The minimum value dictates the maximum current.
c) The maximum current meets our objectives for 1A/Pair for CAT5e wires to allow Type 4
PSEs with CAT5e installations.
d) The maximum voltage is limited by the 60V max with margin for OV protection.
e) In addition, 95W pre 802.3bt systems working on CAT5e are in sync perfectly with PD
minimum voltage at maximum load and 12.5 ohm channel resistance.

SuggestedRemedy

Set PSE minimum voltage to 50V and maximum voltage to 57V as for Type 3 and 4 PSE.

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **91**　　Page 22 of 30
12/16/2014 4:23:54 PM

Cl **33**   *SC* **33.1**   *P* **17**   *L* **52**   # 92
Dwelley, David   Linear Technology

Comment Type **E**   *Comment Status* **X**

    Type 4 should be referenced here - also 33.1.4.1 on page 20 line 42

SuggestedRemedy

    Add an editor's note: "Type 4 operation requires cabling TBD"

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4**   *P* **20**   *L* **6**   # 93
Dwelley, David   Linear Technology

Comment Type **E**   *Comment Status* **X**

    Table is formatted awkwardly - would be better with Types in first column

SuggestedRemedy

    Reformat table. A suggested new table will be sent to the editor separately.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4**   *P* **20**   *L* **26**   # 94
Dwelley, David   Linear Technology

Comment Type **T**   *Comment Status* **X**

    Type 4 is missing

SuggestedRemedy

    "...Type 3 and Type 4 operation."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4.2**   *P* **21**   *L* **5**   # 95
Dwelley, David   Linear Technology

Comment Type **E**   *Comment Status* **X**

    Long list of Types is awkward.

SuggestedRemedy

    "Operation for all Types requires...". This text may move to an informative annex but the remedy should still work.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.1**   *P* **22**   *L* **4**   # 96
Dwelley, David   Linear Technology

Comment Type **TR**   *Comment Status* **X**

    It's not clear how a 4-pair PSE would be wired from this text or Figures 33-1:33-4 and Table 33-2. I believe the term ALT-C should be introduced here to clarify. At minimum some other unique term (ALT-AB?) should be introduced to make clear what a 4p PSE should do. Just "Alternative A or Alternative B or both" is not enough.

SuggestedRemedy

    New figures, table, and text will be suggested in separate presentation at the January meeting.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.4**   *P* **33**   *L* **4**   # 97
Dwelley, David   Linear Technology

Comment Type **T**   *Comment Status* **X**

    Table 33-3 is incomplete - it does not cover the cases where a Type 4 PSE issues ony 2 events, for example (early exit due to power allocation), or 3 or 4 events (early exit due to power demotion). This table was included in AT to force Type 2 PSEs to always provide at least one pulse, but it may be easiest to capture this requirement with a line of text (below) and by deleting the table.

SuggestedRemedy

    Delete table 33-3 and replace with text: "All Type 2, 3 or 4 PSEs shall provide at least one class event if they use dll as their primary means of power classification, and shall provide at least 2 class events if they use physical layer classification." Alternately, completely fill out Table 33-3.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **97**   Page 23 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   12/16/2014 4:23:54 PM
SORT ORDER: Comment ID

Cl **33**   *SC* **33.2.7**   *P* **49**   *L* **42**   # **98**
Dwelley, David   Linear Technology

Comment Type **TR**   *Comment Status* **X**

Several legacy symbols in Table 33-11have had -2P added. This has a real chance of causing confusion in the field since the new labels apply to all Types, not just Types 3 and 4.

SuggestedRemedy

Change labels back to original names and add a note near line 28: "All specifications apply to the active pair set for 2-pair PSEs or each pair set independently for 4-pair PSEs." It may also be appropriate to add explanatory text to sections 33.2.7.x where appropriate.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.5**   *P* **33**   *L* **50**   # **99**
Dwelley, David   Linear Technology

Comment Type **T**   *Comment Status* **X**

tcle1_timer applies to all Types, not just Types 1 and 2.

SuggestedRemedy

remove "for Type 1 and Type 2 PSE"

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.5**   *P* **34**   *L* **34**   # **100**
Dwelley, David   Linear Technology

Comment Type **T**   *Comment Status* **X**

tme1_timer should apply to all Mark events except the last one (whichever that is)

SuggestedRemedy

change text to "A timer used to limit mark event times for all but the last mark event during Multiple Event classification..."

Also fix Table 33-10 on page 48: row 6 Parameter: "Mark event timing (except last Mark event)"; row 8 Parameter: "Last Mark event timing"

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.6**   *P* **36**   *L* **5**   # **101**
Dwelley, David   Linear Technology

Comment Type **T**   *Comment Status* **X**

The concept of "classification not complete" is extended here, and adds confusion: is classification still in progress or did it return an error? This was OK when there were only two types but not now. As I recall, this was intended to cover the case when Class 0 (no class information) was found.

SuggestedRemedy

If the intent is that classification has not yet finished, assign Type 1 (Class 0) or a code that enumerates to "class not complete". If the intent is that classification failed due to an error, return a code that enumerates to "error".

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.6**   *P* **36**   *L* **15**   # **102**
Dwelley, David   Linear Technology

Comment Type **E**   *Comment Status* **X**

Instead of repeating the same sentence 6 times, the original sentence at line 11 should be reworked

SuggestedRemedy

"When a PSE powers a PD of a lower Type than its maximum capability, the PSE shall meet the electrical requirements of the PSE Type that matches the PD Type, but it may choose to meet the electrical requirements of a greater Type (up to its maximum capability) for..."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.6**   *P* **36**   *L* **15**   # **103**
Dwelley, David   Linear Technology

Comment Type **TR**   *Comment Status* **X**

This sentence (and the following sentences) may be interpreted as requiring a Type 3 PSE to provide 2-pair power to a Type 1/2 PD. This will break Green Mode and 1-channel Type 3 PSEs.

SuggestedRemedy

"may choose to meet the electrical requirements of a Type 3 PSE, including providing 4-pair power, for Icon..."

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **103**   Page 24 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   12/16/2014 4:23:54 PM
SORT ORDER: Comment ID

Cl **33**   *SC* **33.2.4.7**   *P* **38**   *L* **1**   # 104
Dwelley, David   Linear Technology

Comment Type **E**   *Comment Status* **X**

Typo in exit logic from state CLASS_EV1: should be pse_skips_multiclass per page 32 line 3

SuggestedRemedy

change "pse_skips_multievent" to "pse_skips_multiclass" (or change page 32 line 3)

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.4.7**   *P* **38**   *L* **25**   # 105
Dwelley, David   Linear Technology

Comment Type **T**   *Comment Status* **X**

Add an exit state to CLASS_EV3 (to node E) to handle the 4-4-0 case (which is currently undefined). This will need to be changed again if 4-4-0 is defined.

SuggestedRemedy

Add an exit state to CLASS_EV3 (to node E) to handle the 4-4-0 case.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.5**   *P* **39**   *L* **40**   # 106
Dwelley, David   Linear Technology

Comment Type **T**   *Comment Status* **X**

The added text "two pair" is overly terse and adds minimal new information. It was originally added to prevent mis-detecting a 2ch PD with a single detection circuit, but with the development of the 4PID protocol, this "two pair" limitation is not needed.

SuggestedRemedy

Return to original text: The PSE shall turn on power only on the same pairs as those used for detection.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6**   *P* **44**   *L* **13**   # 107
Dwelley, David   Linear Technology

Comment Type **TR**   *Comment Status* **X**

New text was added to force the PSE to limit power to Pclass_max or Ptype, *whichever is less*. Power draw is limited by the PD, not the PSE, and the PSE and cabling plant must be designed to handle the maximum power that the PSE is designed to deliver, so there is no benefit in mandating the PSE to limit to the lower of the two limits. Instead, the PSE should be required to provide at least the lowest limit.

SuggestedRemedy

remove the text "whichever is less" (in 4 places).

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6**   *P* **45**   *L* **28**   # 108
Dwelley, David   Linear Technology

Comment Type **T**   *Comment Status* **X**

Any Type PSE that opts to power-limit a port to 13W or less (due to power management or any other reason) should be allowed to use 1-event classification.

SuggestedRemedy

Change Note 1 to read: "Any Type PSE that is limited..." (or "is operating...")
Modify Table 33-8 col 4 row 4: change "No ^1" to "Note 1"

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6.2**   *P* **46**   *L* **24**   # 109
Dwelley, David   Linear Technology

Comment Type **T**   *Comment Status* **X**

1-EVENT_CLASS and CLASS_EV1_LCF are missing from the list of states

SuggestedRemedy

Add 1-EVENT_CLASS and CLASS_EV1_LCF to the list of states, and add a descriptive paragraph (copied from CLASS_EV1) for 1-EVENT_CLASS

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **109**

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Cl **33**   *SC* **33.2.6.2**   *P* **46**   *L* **38**   # 110

Dwelley, David   Linear Technology

Comment Type **E**   *Comment Status* **X**

This section is unnecessarily verbose

SuggestedRemedy

Combine the MARK_EV1-4 and CLASS_EV3-5 sections:
"When a PSE is in the state MARK_EV1, MARK_EV2, MARK_EV3, or MARK_EV4, the
PSE shall..."
"When a PSE is in the state CLASS_EV3, CLASS_EV4, or CLASS_EV5, the PSE shall..."
If Tcle3 remains the same as Tcle2, CLASS_EV2 can also be in the combined sentence.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.7.7**   *P* **54**   *L* **30**   # 111

Dwelley, David   Linear Technology

Comment Type **TR**   *Comment Status* **X**

There is some ambiguity here about what a single-channel PSE must do

SuggestedRemedy

Change text to: "Power shall be removed from one or both pair-sets of a PSE..."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.3.5**   *P* **65**   *L* **5**   # 112

Dwelley, David   Linear Technology

Comment Type **E**   *Comment Status* **X**

Typo in exit arc from IDLE

SuggestedRemedy

Change mid_power_received to mdi_power_received

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.3.5**   *P* **65**   *L* **14**   # 113

Dwelley, David   Linear Technology

Comment Type **T**   *Comment Status* **X**

It makes more sense to have the Vpd < Vreset condition lead to the OFFLINE state, not
the IDLE state, so that present_pd_signature = FALSE is applied (as it was in AF). This is
a problem inherited from AT.

SuggestedRemedy

Move Vpd < Vreset condition to OFFLINE state entry arc

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.3.5**   *P* **66**   *L* **8**   # 114

Dwelley, David   Linear Technology

Comment Type **T**   *Comment Status* **X**

Variable present_class_sig in state MDI_POWER_1 doesn't exist anymore

SuggestedRemedy

Change to present_class_sig_A <= FALSE. Add variable present_class_sig_B <= FALSE.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.5.2**   *P* **69**   *L* **46**   # 115

Dwelley, David   Linear Technology

Comment Type **T**   *Comment Status* **X**

State names are incorrect for PD

SuggestedRemedy

Change CLASS_EVx to DO_CLASS_EVENTx

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **115**

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Cl **33** *SC* **33.3.5.2** *P* **70** *L* **28** # 116
Dwelley, David Linear Technology

Comment Type **T** *Comment Status* **X**

There is some ambiguity in Table 33-17 for 4P operation - the currents could be per pair or the sum of pairs (depending on whether the PD is 1- or 2-channel), and the voltages could be per-pair or the max of both pairs.

SuggestedRemedy

Add a clarifying note that the voltage specs apply per pair-set, and that the current specs apply either to a pair-set or to the sum of the pair-sets, depending on the results of the 4PID test.

Proposed Response *Response Status* **O**

Cl **33** *SC* **33.3.5.2.1** *P* **71** *L* **5** # 117
Dwelley, David Linear Technology

Comment Type **T** *Comment Status* **X**

State DO_CLASS_EVENT_6 is missing from the list

SuggestedRemedy

Add state DO_CLASS_EVENT_6 to the list, or refer to all as the "DO_CLASS_EVENT states" or the "DO_CLASS_EVENT_x states".

Proposed Response *Response Status* **O**

Cl **33** *SC* **33.3.2** *P* **61** *L* **1** # 118
Dwelley, David Linear Technology

Comment Type **TR** *Comment Status* **X**

These 2 sentences appear to require Type 3 and Type 4 PDs to support both Physical Layer and DLL classification (although there are no "shalls"). Market feedback suggests that DLL classification is unpopular among PD manufacturers and should not be required for compliance.

SuggestedRemedy

Add the word "optional" before "Data Link Layer classification" at lines 2 and 6.

Proposed Response *Response Status* **O**

Cl **33** *SC* **33.3.5** *P* **68** *L* **47** # 119
Dwelley, David Linear Technology

Comment Type **TR** *Comment Status* **X**

This sentence appears to require Type 3 and Type 4 PDs to support both Physical Layer and DLL classification (although there is no "shall"). Market feedback suggests that DLL classification is unpopular among PD manufacturers and should not be required for compliance. Type 2 devices already require DLL classification and the text should not change for Type 2.

SuggestedRemedy

Leave original sentence as-is from AT. Add a new sentence below: "Type 3 and 4 PDs implement multiple-event class signatures and optional Data Link Layer classification..."

Proposed Response *Response Status* **O**

Cl **33** *SC* **33.3.5.1** *P* **69** *L* **20** # 120
Dwelley, David Linear Technology

Comment Type **TR** *Comment Status* **X**

The new new text removes the requirement for Type 3 and Type 4 PDs to present one and only one classification signature during classification. This change has not been agreed to in BT and may be a bad idea for interoperability.

SuggestedRemedy

Leave text as is was in AT until a baseline text motion is approved.

Proposed Response *Response Status* **O**

Cl **33** *SC* **33.3.8** *P* **78** *L* **6** # 121
Dwelley, David Linear Technology

Comment Type **TR** *Comment Status* **X**

New MPS specs should apply to both Types 3 and 4. We may also consider allowing this behavior for Type 1 and 2 PDs (current text would disallow T1/2 from using the new MPS). This is an expansion of features for T1/2 and thus would not cause any existing T1/2 devices to be non-compliant.

SuggestedRemedy

Change text: "The MPS for Types 3 and 4 PDs shall be..." (line 6)
"...when connected to a Type 3 or 4 PSE." (line 13)

Proposed Response *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **121**

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Cl **33**   *SC* **33.1.1**   *P* **17**   *L* **53**   # 122
Beia, Christian   STMicroelectronics

Comment Type   **T**   *Comment Status* **X**
   Type 4 operation is not listed.

SuggestedRemedy
   Add this sentence at the end of the paragraph:
   Type 4 operation requires TBD or better cabling and a TBD derating of the cabling
   maximum ambient operating temperature.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4**   *P* **20**   *L* **26**   # 123
Beia, Christian   STMicroelectronics

Comment Type   **T**   *Comment Status* **X**
   The new sentence is also valid for Type 4 systems

SuggestedRemedy
   Add Type 4 in the sentence to read:
   All four twisted pairs, connected from PSE PI to PD PI are required for Type 3 and Type 4
   operation.

Proposed Response   *Response Status* **O**

Cl **33A**   *SC* **33A.3**   *P* **127**   *L* **39**   # 124
Beia, Christian   STMicroelectronics

Comment Type   **T**   *Comment Status* **X**
   The note refers to normative text which should be moved to 33.1.2, so it also needs to be
   moved

SuggestedRemedy
   move the following text to the end of clause 33.1.2:
   Note: 7.5% is the worst case pair to pair resistance unbalance at 100 milliohms of channel
   pair to pair resistance difference. At 100m channel length, the cable and connectors
   ensures 5.5% maximum channel pair to
   pair resistance unbalance.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.2.6**   *P* **45**   *L* **10**   # 125
Beia, Christian   STMicroelectronics

Comment Type   **T**   *Comment Status* **X**
   Table 33-8
   Type 3 and Type 4 PDs should be allowed to skip DLL classification if successfully
   classsified and identified with multiple-event classification.

SuggestedRemedy
   Add a line in Table 33-8 for Type 3 and 4 PSE/PD Types, copied from the Type 2 line, then
   modified to allow Type 3 and 4 PDs to skip DLL classification.

   So the relevant line of Table 33-8 will be:

   Phisical Layer classification | DLL classification | PSE allowed? | PD allowed?
   Multiple event | No | Yes | Yes

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.7.6**   *P* **76**   *L* **43**   # 126
Beia, Christian   STMicroelectronics

Comment Type   **T**   *Comment Status* **X**
   Type 3 and Type 4 PDs behavior during transient at PSE PI has to be described.

SuggestedRemedy
   Modify the sentence:
   A Type 2 PD with peak power draw that does not exceed PClass_PDmax and has an
   input capacitance of 180 μF or less requires no special considerations with regard to
   transients at the PD PI.

   To read
   Type 2, 3 and 4 PDs with peak power draw that do not exceed PClass_PDmax and have
   an input capacitance of 180 μF or less require no special considerations with regard to
   transients at the PD PI.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **126**   Page 28 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   12/16/2014 4:23:54 PM
SORT ORDER: Comment ID

Cl **33**   *SC* **33.3.7.6**   *P* **76**   *L* **54**   # 127
Beia, Christian   STMicroelectronics

Comment Type **T**   *Comment Status* **X**

Type 3 and Type 4 PDs behavior during transient at PSE PI has to be described

SuggestedRemedy

Modify the sentence:
"A Type 2 PD shall meet both of the following:
a) The PD input current spike shall not exceed 2.5 A and shall settle below the PD upperbound template (see Figure 33–18) within 4 ms. During this test, the PD PI voltage is driven from 50 V to 52.5 V at greater than 3.5 V/μs, a source impedance of 1.5 ?, and a source that supports a current greater than 2.5 A."

To read:
"Type 2,3 and 4 PDs shall meet both of the following:
a) The PD input current spike shall not exceed 2.5 A per pair-set and shall settle below the PD upperbound template (see Figure 33–18) within 4 ms. During this test, the PD PI voltage is driven from 50 V to 52.5 V at greater than 3.5 V/μs, a source impedance of 1.5 ?, and a source that supports a current greater than 2.5 A."

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3.7.6**   *P* **77**   *L* **10**   # 128
Beia, Christian   STMicroelectronics

Comment Type **T**   *Comment Status* **X**

Type 3 and Type 4 PDs behavior during transient at PSE PI has to be described

SuggestedRemedy

Modify the sentence:
The current limit at the MDI (MDI ILIM) is defined by Equation (33–14)

To read:
the current limit per pair-set at the MDI (MDI ILIM-2p) is defined by Equation (33–14)

Then modify the Equation 33-14 using the definition MDI ILIM_2p

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.1.4.3**   *P* **21**   *L* **22**   # 129
Beia, Christian   STMicroelectronics

Comment Type **TR**   *Comment Status* **X**

The pair-to-pair resistance unbalance is a requirement for 4-pairs systems. Any requirement needs to be in the mail clause, and not in the Informative text (annex).

SuggestedRemedy

Add a sentence in 33.1.4.3 to read:
Four-pair operation requires that the channel pair-to-pair resistance difference shall be not greater than 100 milliohms or the pair-to-pair resistance unbalance not greater than 7.5%, whichever is a greater unbalance.
Channel pair-to-pair resistance difference and unbalance are defined in Annex33A.3

Proposed Response   *Response Status* **O**

Cl **33A**   *SC* **33A.3**   *P* **127**   *L* **15**   # 130
Beia, Christian   STMicroelectronics

Comment Type **TR**   *Comment Status* **X**

The first sentence is normative and has to be moved to clause 33.1.2

SuggestedRemedy

Remove the following sentence fom annex 33A.3:
Four pair operation requires the specification of resistance unbalance between each two pairs of the channel, not greater than 100 milliohms or resistance unbalance of 7.5% whichever is a greater unbalance.

Proposed Response   *Response Status* **O**

Cl **33**   *SC* **33.3**   *P* **59**   *L* **48**   # 131
Beia, Christian   STMicroelectronics

Comment Type **TR**   *Comment Status* **X**

As specified in clause 33.1.4 a PoE system is defined from a single PSE o a single PD. In Clause 33.2 the PSE is explicitly defined as an equipment that provides the power to a single PD.
Allowing 4-pair power it is now also needed to specify the PD as a device requesting power from a single PSE.

SuggestedRemedy

Add the words: "from a single PSE" to the first sencence in clause 33.3, to read:
A PD is the portion of a device that is either drawing power or requesting power from a single PSE by participating in the PD detection algorithm.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **131**   Page 29 of 30
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Cl **33**　　*SC* **33.1.4**　　　　*P* **20**　　　*L* **26**　　　# 132

Balasubramanian, Koussalya　　　Cisco Systems Inc,

Comment Type　**TR**　　*Comment Status*　**X**

The draft says "All Four twisted pairs, connected from PSE PI to PD PI are required for
Type 3 operation". Given Type 3 can operate in 15.4W and 30W levles, this implies 4-
pairs is a MUST even for 15.4 and 30W operations.

SuggestedRemedy

Suggest to reword the statement to say "All four twisted pairs, connected from the PSE PI
to PD PI are required to source greater than 30W of power at PSE PI".

Proposed Response　　　*Response Status*　**O**

Cl **33**　　*SC* **33.2.6**　　　　*P* **45**　　　*L* **29**　　　# 133

Balasubramanian, Koussalya　　　Cisco Systems Inc,

Comment Type　**T**　　*Comment Status*　**X**

Table 33-8 - The note below the table says "A Type 3 PSE that is limited to Type 1 power
levels ....." - It will be more clear to call out the power level   than associate it with a Type.

SuggestedRemedy

Suggest note to be changed to "A Type 3 PSE that is limited to 15.4W or less ....."

Proposed Response　　　*Response Status*　**O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **133**

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