



# Outstanding Issues

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## IEEE 802.3-2012: 33.3.1

- The PD shall withstand any voltage from 0 V to 57 V at the PI indefinitely without permanent damage
  - Green text is clear and complete
  - Red text is ambiguous and has two problems:
    - 57V across any single pair must be excluded
    - How many pairs at the same time?
      - This is a question for another day...

# Proposed Fix: Single Pair Set

- The PD shall withstand any common-mode voltage from 0 V to 57 V per pair set at the PI indefinitely without permanent damage
  - Section 1.4: “Pair set: Either of the two valid 4-wire connection as listed in 33.2.3”
- Alternate text proposed by George Z in Pittsburgh:
  - The PD shall withstand any voltage difference from 0 V to 57V applied between any pin-pairs at the PI indefinitely without permanent damage. The two pins in each pin-pair shall correspond to those which connect to balanced twisted wire pairs of a link segment, and include any combination of pin-pairs from the set  $\{(1,2), (3,6), (4,5), (7,8)\}$ , as indicated in Table 33-13.
  - More words but the same meaning – either is OK
- This solves the within-a-pair-set problem but leaves the number of pair sets ambiguous

# SS vs. DS Classification

- SS PDs are interpreted differently than DS PDs in D1.0 today:
  - SS class = total PD power
  - DS class = pair power
    - total power is either sum of classes or 2x greater class
    - Possibly 1x class for Class 5 and above

# Complex Class Table

- Red classes are >100W

SS Class	Power at PSE	Power at PD
1	4	3.84
2	7	6.49
3	15.4	13
4	30	25.5
5	45	40
6	60	51
7	75	62
8	99	71.3

DS Class Alt-A	DS Class Alt-B	PSE Power	PD Power	DS Class Alt-A	DS Class Alt-B	PSE Power	PD Power
1	1	8	7.68	5	1	49	43.84
1	2	11	10.33	5	2	52	46.49
1	3	19.4	16.84	5	3	60.4	53
1	4	34	29.34	5	4	75	65.5
1	5	49	43.84	5	5	90	80
1	6	64	54.84	5	6	105	91
1	7	79	65.84	5	7	120	102
1	8	103	75.14	5	8	144	111.3
2	1	11	10.33	6	1	64	54.84
2	2	14	12.98	6	2	67	57.49
2	3	22.4	19.49	6	3	75.4	64
2	4	37	31.99	6	4	90	76.5
2	5	52	46.49	6	5	105	91
2	6	67	57.49	6	6	120	102
2	7	82	68.49	6	7	135	113
2	8	106	77.79	6	8	159	122.3
3	1	19.4	16.84	7	1	79	65.84
3	2	22.4	19.49	7	2	82	68.49
3	3	30.8	26	7	3	90.4	75
3	4	45.4	38.5	7	4	105	87.5
3	5	60.4	53	7	5	120	102
3	6	75.4	64	7	6	135	113
3	7	90.4	75	7	7	150	124
3	8	114.4	84.3	7	8	174	133.3
4	1	34	29.34	8	1	103	75.14
4	2	37	31.99	8	2	106	77.79
4	3	45.4	38.5	8	3	114.4	84.3
4	4	60	51	8	4	129	96.8
4	5	75	65.5	8	5	144	111.3
4	6	90	76.5	8	6	159	122.3
4	7	105	87.5	8	7	174	133.3
4	8	129	96.8	8	8	198	142.6

# Potential solutions

- Require matched class at each ALT, Class is always total PD power (1x)
  - 8 power levels (SS table)
- Require matched classes, 2x C1-C4, 1x C5-C8
  - DS C0-C4: Class = pair power, total = 2x Class
  - DS C5-C8 and all SS: Class = total PD power
  - Net 10 power levels: 12 available, 2 near-duplicates
- Require matched classes, no split, always 2x
  - DS C0-C4: Class = pair power, total = 2x Class
  - DS C5-C8 and all SS: Class = total PD power
  - Net 11 power levels, 16 available, 2 near-duplicates, 3 above 100W
- Allow mixed classes, total DS power is always 2x greatest Class
  - Same as above: 11 power levels
- Allow mixed classes, total DS power is always sum of Class powers
  - 44 classes, 72 permutations, 25 above 100W

# How Many Classes do we Need?

- SS PDs only have 8 power choices
- Do DS PDs need 11 (or 44)?