The POWER Behind Your Designs

PoE Plus - IEEE 802.3at

Ping-Pong Proposed Levels

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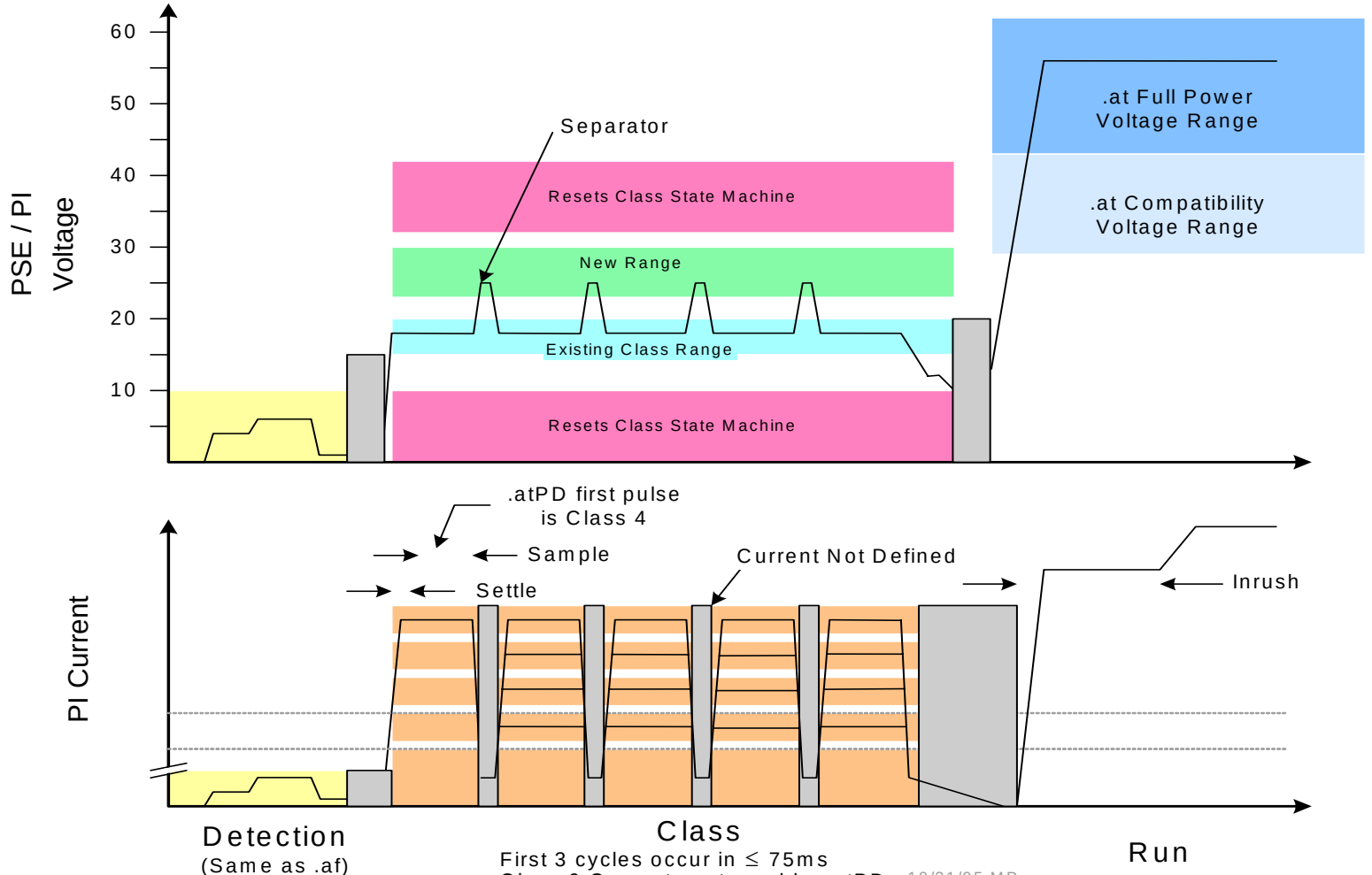
Ping-Pong Classification - Review

- Basic idea is to extend existing Classification to multiple cycles
- Classification method is similar to the existing method
- Handshake system
  - .at PD learns PSE type
  - .at PSE learns PD type
- Misidentification avoided with multi-cycle operation and coding techniques
- Allows for large number of classes by either endpoint or midspan PSE
- The number of classes can be easily increased

IEEE 802.3at Ping-Pong Review

Example of Ping-Pong 802.3at Classification Plan

Note: Waveforms Uncontrolled in Gray Areas



10/31/05 MP

Class Numbering Rules

Disallowed Plus Classes

First	Second	Third	Fourth	Fifth	
0 - 3	X	X	X	X	N/A
4	0	X	X	X	N/A
4	X	0	X	X	N/A
4	X	X	0	X	N/A
4	X	X	X	0	N/A
4	4	4	X	X	N/A

This allows for 240 classes that can be allocated.

The POWER Behind Your Designs

Proposed Class Set

Number	Increment	From	To	±Tolerance/ Average value
1	1	0	1	100%
2	1	1	2	33%
3	1	2	3	20%
4	1	3	4	14%
5	1	4	5	11%
6	1	5	6	9%
7	1	6	7	8%
8	1	7	8	7%
9	1	8	9	6%
10	1	9	10	5%
11	1	10	11	5%
12	1.5	11	12.5	6%
13	1.5	12.5	14	6%
14	1.5	14	15.5	5%
15	1.5	15.5	17	5%
16	2	17	19	6%
17	2	19	21	5%
18	2	21	23	5%
19	2	23	25	4%
20	2	25	27	4%
21	2	27	29	4%
22	3	29	32	5%
23	3	32	35	4%
24	3	35	38	4%
25	3	38	41	4%
26	3	41	44	4%
27	3	44	47	3%
28	3	47	50	3%
29	3	50	53	3%
30	3	53	56	3%
31	3	56	59	3%
32	4	59	63	3%
33	4	63	67	3%
34	4	67	71	3%
35	4	71	75	3%
36	4	75	79	3%
37	4	79	83	2%
38	4	83	87	2%
39	4	87	91	2%
40	4	91	95	2%
41	5	95	100	3%

1/10/2006 MP

Proposed Class Set

- **Power Increments are selected to:**
  - Keep tolerance within practical limits (power load predictability)
  - Keep a reasonable granularity for better supply utilization
- **Results in 41 classes**
  - About what other presentations have proposed
  - Distribution is flattened between logarithmic and linear
- **This set was not Unique**
  - Lots of ways to do this

Class Proposal

- One group of 4 pair classes
- One group of 2 pair classes
- Possible allocation of statistical group
  - For Example
    - Average ≤ 25% peak, DC < 10%, Random
  - Not many groups, and not an elegant solution
- Suggest leaving a lot of unused
- Possible to leave some vendor-specific codes for closed systems

Class Proposal

- **Additional Issues**
  - May want to distinguish between 2 pair PSE and 4 Pair
  - Possible use of 4 pulse and 5 pulse
  - Alternatively, PD might look for Class on both pairs for 4 Pair

Class Proposal

- Discussion