IEEE802.3at Task Force

Vport ad hoc
Draft 1.0
Suggested Remedy for comment #34

Rev 001

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Comment #34

33.3.5.2, Page 60, Line 47, TR, Draft 1.0

Comment:

The equation and instruction for measuring PPort seem unnecessary.

The power limit applies regardless of the PE voltage and cable impedance.

The sudden appearance of a resistive approximation of the cable plant really adds nothing for the reader. Stating that the power limit applies over the specified input voltage range is simply redundant.

Telling the reader that power equals voltage times current is a bit patronizing.

Suggested Remedy:

Replace 33.3.5.2 with the following:

The specification for PPort in Table 33-12 (item 2) shall apply for the input power averaged using any sliding window with 1s width.

Adhoc Discussion

Background from 802.3af

The PD is not just a resistor it is a system which present a load with negative impedance, connected to a limited powe source through non zero impedance connection. Such system may present the following problems:

a) Startup oscillations (low frequency) which was solved in the standard by defining the UVLO functions through Von and Voff parameters in Table 33-5. (See reference 1)

b) High frequency oscillations which can be solved by meeting the guidelines in Annex 33D. (See reference 2)

c) Low frequency oscillations during normal powering due to PD load variations in a presence of current limit functions in the PD or PSE or both. In order to verify that the PD is operating in stable operation mode, it is required to operate it at the worst case conditions that allows marginal stability which happens at maximum cable resistance, load variations from minimum load to maximum load, and through entire operating voltage range. (See slide 6, reference 2)

d) In addition to (c), PPort maximum is required to be met at worst case operating condition, which is at the worst PD DC/DC efficiency. PD DC/DC efficiency is not a constant. It is a function of PD input voltage range, PD load which both are function of Cable resistance and Iport. As a result the test conditions in (c) applies too.

In b, c and d, testing the PD with voltage source at a single voltage value and short cable will not cover worst case conditions.

e) The equation for PPort was added to clarify that Pport is function of the average power product which can be measured with RMS or DC values both, averaged over 1sec.

Other inputs:

This section is there to ensure stability but it is written to test average power.

It is suggested to change title from: **Input average power test conditions** to **System Stability Test Conditions**.

Proposed Remedy

ACCEPT IN PRINCIPLE

Change from:

33.3.5.2 Input average power

The specification for PPort in Table 33–12 shall apply for the input power averaged over 1 second.

For a Type 1 PD PPort shall be measured when the PD is fed by 44 V to 57 V with 20 Ω in series.

For a Type 2 PD PPort shall be measured when the PD is fed by 44 V 50 V to 57 V with 12.5 Ω in series.

PPort is defined $P\text{Port} = V\text{Port} \times I\text{Port}$

To

33.3.5.2 Input average power

The specification for PPort in Table 33–12 shall apply for the input power averaged over 1 second.

33.3.5.2.1 System Stability Test Conditions

PPort shall be measured when the PD is fed by Vport_min to Vport_max with Rchannel_max in series.

PPort is defined *as:*

$P\text{Port} = V\text{Port} \times I\text{Port}$

Where

Pport is the average input power

Vport is the static input voltage

Iport is the input current, either DC or RMS.

Rchannel_max is defined in Table TBD. *(Table TBD should contain Channel Model data such: Class C 40 Ohms, Class D 25 Ohms, DC resistance unbalance etc.)*

References

- 1. IEEE802.3af Remote Powering: http://www.ieee802.org/3/af/public/may00/lehr_1_0500.pdf
- 2. PSE-PD system stability: http://www.ieee802.org/3/af/public/sep01/darshan_1_0901.pdf