PSE Startup Discussion

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Overview

• A customer identified an interoperability issue between a TI PSE controller IC and a third party PD.
• Inoperability failure was found to be caused by PSE voltage fluctuations which are interpreted by the PD as a Layer 1 Type 2 acknowledge.
• Review of the IEEE specification has led to additional questions regarding legacy device interoperability and present PSE requirements.
• Testing with additional PDs has shown at least one other PD is susceptible with the TI PSE; I have not tested other PSE controllers.
TI PSE and Third Party PD

250μS

Zoom Factor: 125 X

20.0mAΩ

10.0V

80.0μS

34.95%

10.0MS/s

1M points

-29.4 V

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16:00:00
IEEE Specifications

- IEEE Std 802.3af through 802.3-2008 allowed 1ms of settling in section 33.2.8.5.
- IEEE Std 802.3at, without settling time (now 33.2.7.5), was published Oct 30, 2009.

The PSE IC in question was released June 16, 2009.
Summary

• 802.3at may have caused previously compliant equipment to be non-compliant.
• PSE startup voltage fluctuations are not precluded by 802.3at.
• PDs which have demonstrated interoperability problems are compliant to 802.3at.
• Compliant devices which do not interoperate are not good.

• I expect to submit a comment against 33.2.7.5 to the effect of:
  1. Add allowance for 1ms voltage fluctuation at PSE start.
  2. Require “monotonically increase” of port voltage after 1ms.
  3. Add a NOTE in the PD section about problems with PSEs during startup.

• I would appreciate off line conversations.