



IEEE802.3 4P Study Group

PD Behavior in Undefined 20.5V~30V Area

November 2014, San Antonio

Gaoling Zou, MAXIM Integrated Products

gaoling.zou@maximintegrated.com

Goal of this Presentation

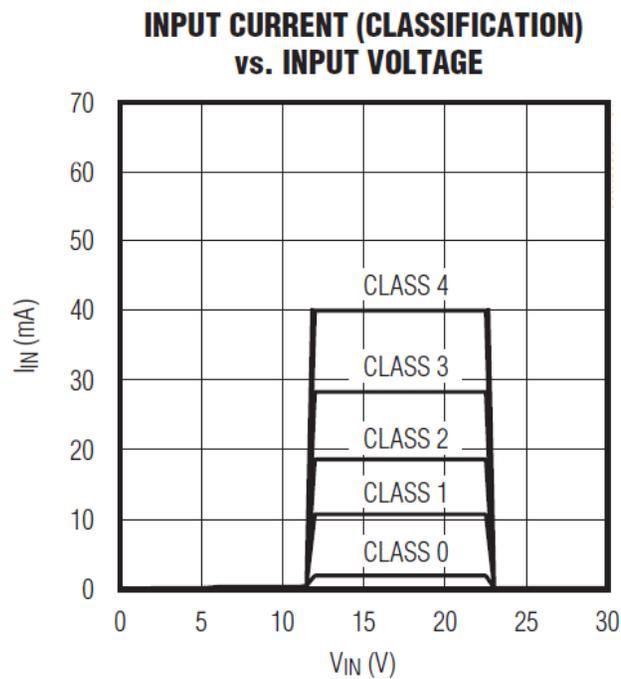
- Describe the behavior of Type1 and Type2 PD in undefined area
- Address the concerns
 - > 2-Level Classification (Kanata, September 2014)

Main Concerns/Issues

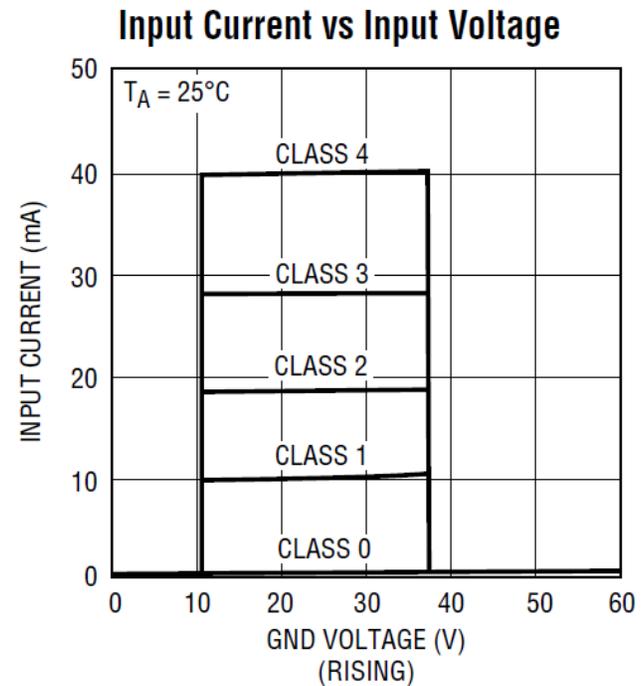
- “Known Issue” of Classification
 - > PD shall NOT respond with different current provided with the same classification voltage
 - 4P PoE systems use cases and proposed requirements, Yair Darshan, Jan 2014
 - Class 5, 3-Event Classification, Gaoling Zou, Mar 2014
 - Classification Current Width Modulation, Gaoling Zou, May 2014
 - Classification Current Width Modulation, Gaoling Zou, Jul 2014
 - IEEE P802.3bt Mutual Identification, David Abramson, Sep 2014
 - Classification Using Hysteresis, David Dwelley, Sep 2014
- Voltage from 20.5V up to the PD UVLO turn ON, is undefined area in 3af/3at Standard.
 - > Second Level Classification voltage is in this area and may have backward compatible issue
 - 2-Level Classification, Gaoling Zou, Sep 2014

Type1/Type2 PD Behaviors

Case1



Case2



The PD responds with either no/low (couple of mA) current or class current when operated in the undefined region.

Summary

- When detecting Class0-3 in the 1st finger, Type3 PSE will power up the Type1 PD by skipping the 2nd and 3rd finger;
- If it is Class4 in the 3rd finger, then type3 PSE limits the power within 30W;

Annex-

Factors to Select 2nd Level Classification Voltage

PSE Side

- The lower limit of 26.5V
 - > Classification Disable Threshold * at PD controller side
 - > 2xVF of the input diode bridge.
- The upper limit of 29.5V
 - > PD power supply turn off voltage Voff (30V in 3at standard)

PD Side

- The lower limit of 25.5V
 - > The min of PSE VCLE
 - > 2xVF at the input diode bridge
- The upper limit of 29.5V
 - > The max of PSE VCLE
 - > Very minimum of VF at active bridge

*The Classification current will be turned OFF when PD input voltage is greater than the threshold (refer to the picture in CASE1 at page4).

Annex- 3-Event w/ 2-Level Classification

- Type3 PD needs to provide 40mA in first 2-Event classification as 3at.
- Type3 PSE probes 2nd Level Classification Voltage between 26.5~29.5V
- Type3 PSE uses the same Classification Event Timing and Mark Event Timing as in 2-Event

