



IEEE802.3 4P Study Group

Class 5, 3-Event Classification

An Classification Approach for 3bt PoE

March 2014

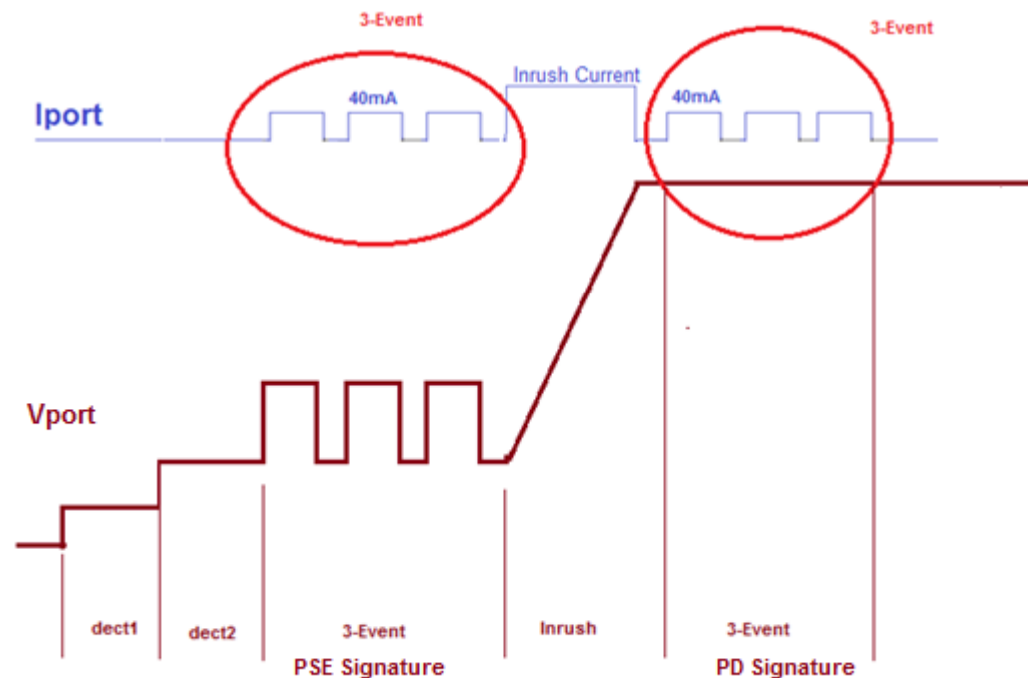
Gaoling Zou,
MAXIM Integrated Products
Gaoling.Zou@maximintegrated.com

Class5

- A Class Signature for 3bt/Type3 PoE device
- 3-Event Physical Layer classification
- Total min power of 60W at output of PSE
- Total max power of 49W at input of PD

3-Event Physical Layer classification

- $I_{Class}=40mA$
- Same Class/Mark Event Voltage
- Same IMark Limit
- Same Class/Mark Event timer
- One more Class/Mark Event than 2-Event Classification
- 3-Event is provided by a Type3 PSE when detecting 40mA Classification current
- 3-Event is repeated to provide Type3 PD signature after PD is fully ON



How It Works

- Type 3 PD is connected (with 40mA Classification current and be able to provide 3-Event 40mA current after Isolation Switch fully enhanced);
- After successful detection, Type3 PSE provides 3-Event during classification after seeing 40mA current;
- the PD will be turned into Inrush mode; (could be up to 450mA per the 3af/3at standard)
- PD checks the VGS of the isolation switch (> 4.5V);
- Once detecting inrush is completed, the PD provides Type 3 PD signature: three pulse currents of 40mA with timing of 3-Event;
- 60W min output power is enabled.

Implementation on both PSE and PD sides

PSE

- Is able to provide 3-Event Classification as PSE Type 3 signature when seeing 40mA classification current from PD;
- Is able to detect the additional PD signature from Type 3 PD after PSE is powered ON.

PD

- Is able to provide Type3 PD Signature;
- Is able to detect and respond 3-Event Classification signature from Type3 PSE;

Benefits of Class5, 3-Event Proposal

- Provide Type 3 Signature for both PSE and PD
- Backwards compatible with Type1 and Type2 PoE
- Simplify the 3bt standard
- Simplify the 3bt PoE development

Classification Table

Measured I_{Class}	Classification Stage 1	Classification Stage 2
0 mA to 5.00 mA	Class 0	Class 0
> 5.00 mA and < 8.00 mA	May be Class 0 or 1	May be Class 0 or 1
8.00 mA to 13.0 mA	Class 1	Class 1
> 13.0 mA and < 16.0 mA	Either Class 1 or 2	Either Class 1 or 2
16.0 mA to 21.0 mA	Class 2	Class 2
> 21.0 mA and < 25.0 mA	Either Class 2 or 3	Either Class 2 or 3
25.0 mA to 31.0 mA	Class 3	Class 3
> 31.0 mA and < 35.0 mA	Either Class 3 or 4	Either Class 3 or 4
35.0 mA to 45.0 mA	Class 4	Class 5
> 45.0 mA and < 51.0 mA	Either Class 4 or invalid	Either Class 4 or invalid class

NOTE—A Type 1 PSE may ignore I_{Class} and report Class 0.

Feedbacks

- 50mA Classification current
- One more event delays the PD power ON time
- Design Complexity of PSE/PD