# On guarding against overshoot TDECQ measurement; Rev. 1b

This revision is a summary of the proposal that is leads to draft changes given in the presentation by the 2020/03/24 presentation by Roberto and Vipul

This presentation for Atlanta-substitute interim 2020/03 is a continuation of work presented in zivny_3cu_01_0120 in Geneva 2020/01 and of work done by Roberto Rodes and Vipul Bhatt in 2020/03.

Pavel Zivny, Tektronix



Tektronix

# Supporters

- Vipul Bhatt, Roberto Rhodes: II-VI

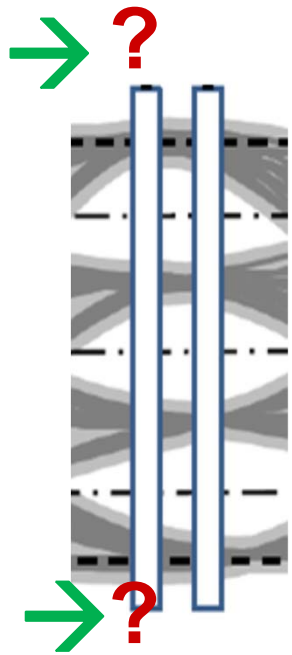
# Overshoot, undershoot, and peak-to-peak power impact on the link performance

- This work was done Roberto Rodes and Vipul Bhatt and is now presented in

  rodes_3cu_01_0320.pdf

- The measurement recommendations considered here are based on that work.

# Methodology for a overshoot / undershoot guarding in standards using TDECQ

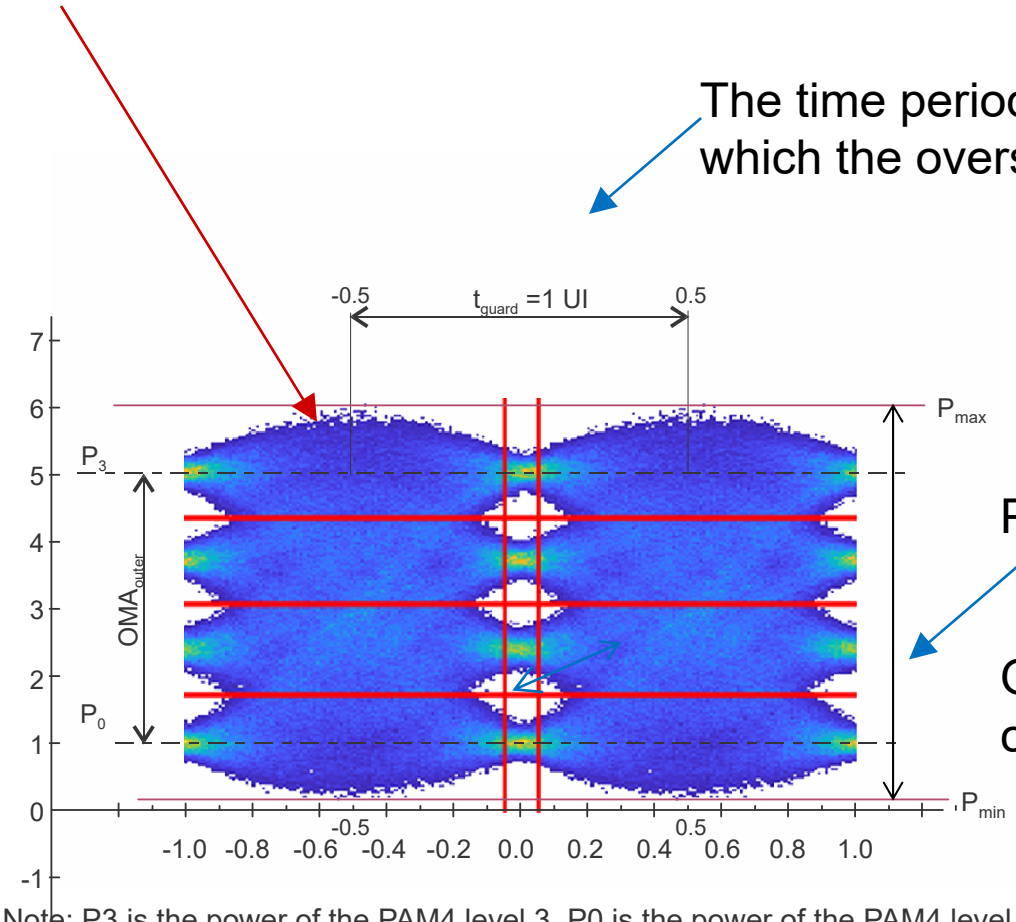



- The overshoot to guard against is:
- At TP2: *absolute overshoot* and *relative overshoot*
- *At TP3 and TP2: relative overshoot for both dispersion extremes*

- The pattern used is SSPRQ because:
  - It presents a mix of frequencies, thus exciting more overshoot effects
  - It is practical – already used, no need to change the DUT into another mode
- The observation bandwidth is the same as for TDECQ measurement
- Measurement is done before equalizer

# Guarding against the overshoot: Maximum power, aka Absolute overshoot, $Power_{Pk\text{-}Pk}$

- Focusing on the peak – to – peak value at TP2




The time period (relative to the UI duration) over which the overshoot guard is active shall be 1 U

$P_{TxPk\text{-}Pk} = P_{max} - P_{Min}$

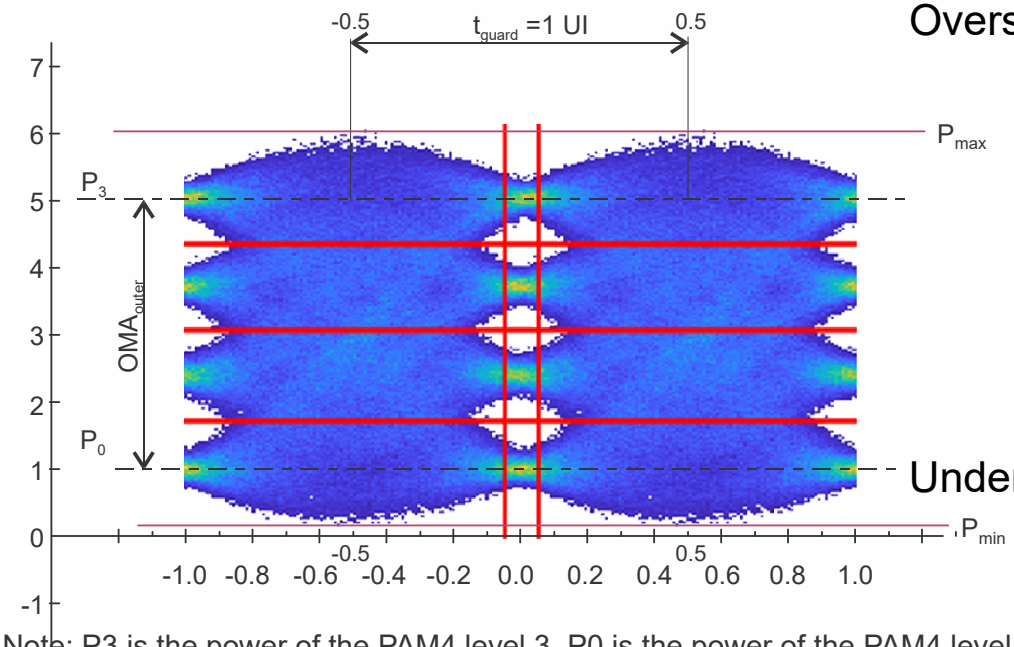
Oscilloscope noise compensation can be used

Note: P3 is the power of the PAM4 level 3, P0 is the power of the PAM4 level 0, and OMAouter is the optical modulation amplitude, all de?ned in clause 122.8.4

# Guarding against the overshoot
# Overshoot, undershoot aka relative overshoot

- Measure at TP3 with both positive and negative dispersion
- Measure also at TP2
- Again compensation for Oscilloscope noise allowed

The time period (relative to the UI duration) over which the overshoot guard is active shall be 1 UI




Overshoot = ( $P_{Max} - P_3$ ) / ( OMAouter )

Undershoot = ( $P_{Min} - P_0$) / ( OMAouter)

Note: P3 is the power of the PAM4 level 3, P0 is the power of the PAM4 level 0, and OMAouter is the optical modulation amplitude, all de?ned in clause 122.8.4

# Noise consideration

- The DUT noise is intentionally present in the result
- The DUT noise is sampled to the same extent it is in TDECQ.  This might be sufficient or not but it is the same.
- The oscilloscope noise is included currently.  This is a slight pessimism.  It is not important to the concept.

# Questions?

- Thank you,

  Pavel