

802.3cy D1.2 Electrical Test Comments

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Introduction

- 25GBASE-T1 PMA transmitter electrical spec
 - 165.5 PMA electrical specifications
 - 165.5.1 Test modes
 - 165.5.3 Transmitter electrical specifications
- All proposed numbers are subject to further revisions, after additional analysis and feedbacks from the Task Force

Maximum Output Droop

- Test Mode 6 is relevant to the low frequency corner of Tx signal
- For 10GBASE-T1, this is a continuous pattern
 - 128 {+1} symbols followed by 128 {-1} symbols.
- For 25GBASE-T1, we propose to keep the same period of this continuous pattern
 - 320 {+1} symbols followed by 320 {-1} symbols

Transmitter Linearity

- 10GBASE-T1 SNDR spec = 38dB
- Propose to keep the same 38dB for 25GBASE-T1

TX_TCLK Frequency

- For 10GBASE-T1 Test Mode 1 and Test Mode 2 square wave, the output clock frequency = $5.625\text{GHz} / 32 = 175.78125\text{MHz}$
 - Note: divide by power of 2 is preferred for accurate jitter measurements
- For 25GBASE-T1, a different TX_TCLK frequency is required
 - $175.78125\text{ MHz} = 14.0625\text{ GHz} / 80$ (not a power of 2)
 - A higher frequency output clock enables more accurate jitter measurement
 - We propose **TX_TCLK_879 = 878.90625 MHz = 14.0625 GHz / 16** for 25GBASE-T1

Jitter Requirements

- From 10GBASE-T1 to 25GBASE-T1, the unit interval is 0.4X
- We propose to scale the following jitter spec by 0.4X
 - Test mode 1 MASTER RMS jitter ≤ 0.4 ps
 - Test mode 1 MASTER P2P jitter ≤ 4 ps
 - Test mode 1 SLAVE RMS jitter ≤ 0.8 ps
 - Test mode 1 SLAVE P2P jitter ≤ 8 ps
 - Test mode 2 square wave RMS jitter ≤ 0.4 ps
 - Test mode 2 square wave P2P jitter ≤ 4 ps
 - Jitter measurement interval change to 0.4 ms $\pm 10\%$

Jitter Requirements (cont.)

- To measure the peak-to-peak deterministic jitter (DJpk-pk) follow the steps as specified in 94.3.12.6.1, with the following modifications to step 5:
- $f_n = 2.5 \text{ MHz}$, $T = 27.2 \text{ ns}$.
- Using this method, DJpk-pk shall be less than 3.6 ps.

- To measure peak-to-peak even-odd jitter (EOJpk-pk) follow the steps as specified in 94.3.12.6.2.
- Using this method, EOJpk-pk shall be less than 1.6 ps