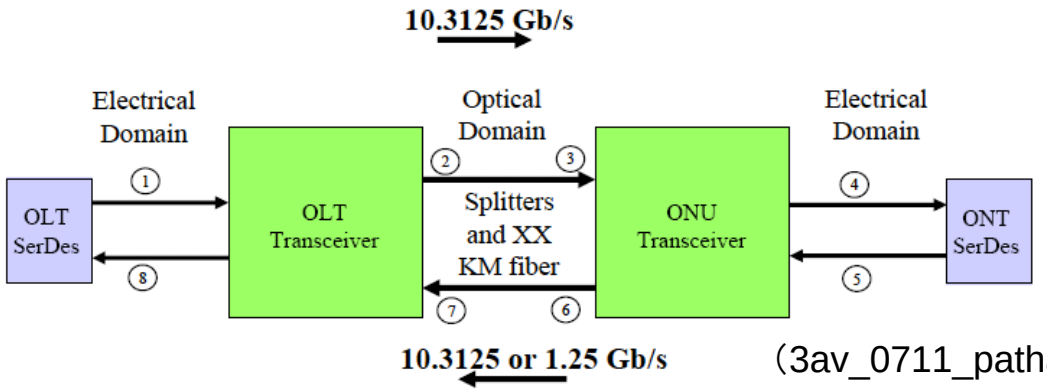
10GEPON Jitter Budget

Proposal for measurement setup

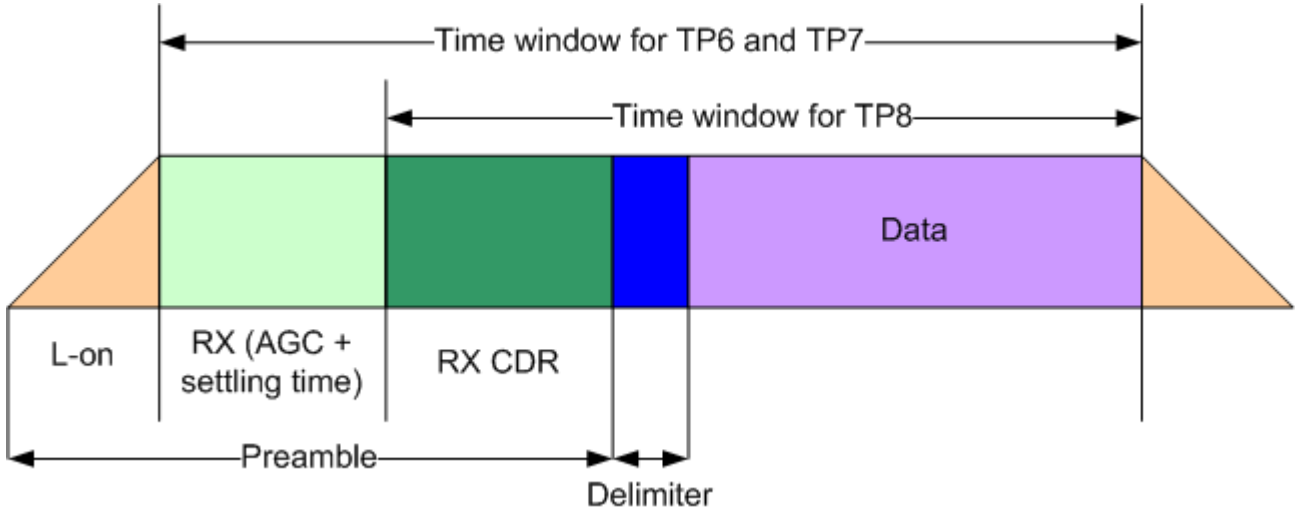
Vijay Pathak - Kawasaki Microelectronics

Jitter reference model

- Do we need a specific arrangement to measure 8 test points ?



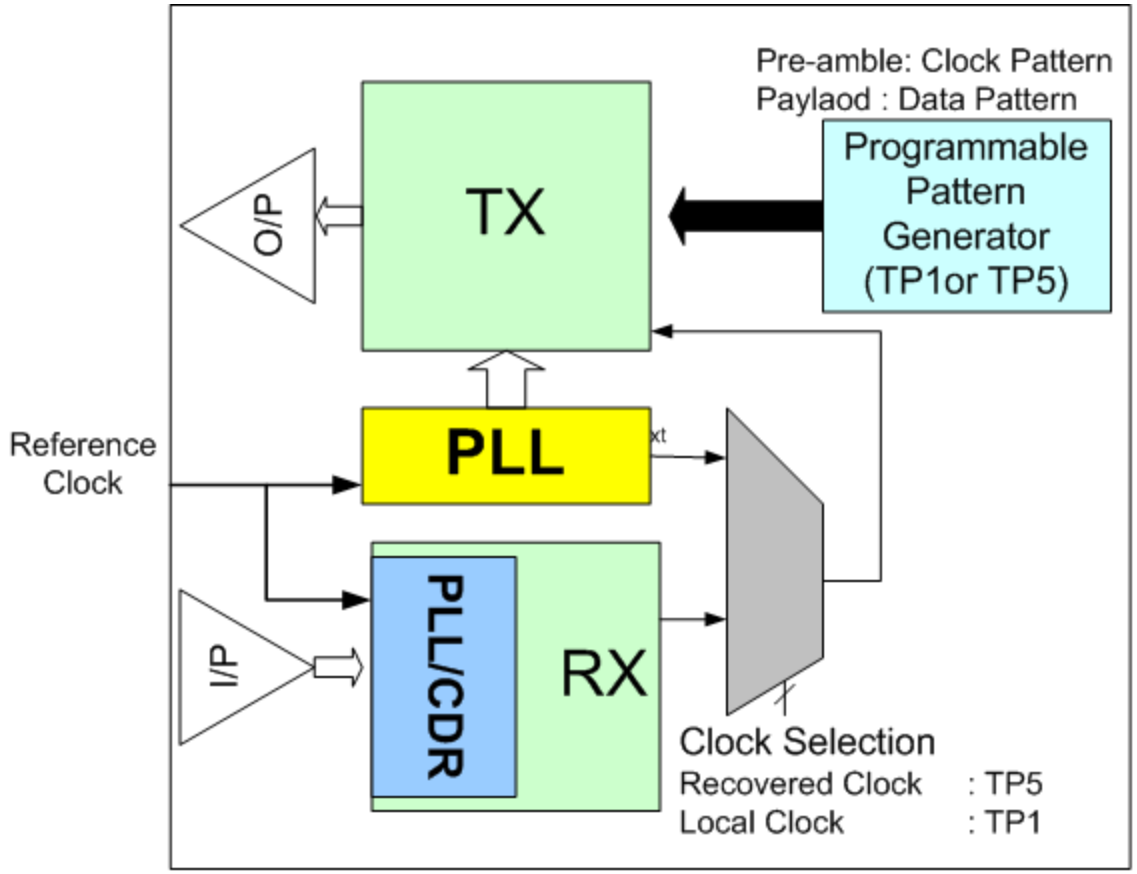
（3av_0711_pathak_1.pdf)



Motivation

- Jitter characteristics are different during pre-amble and payload
- Burst mode CDR locks to pre-amble pattern
- To measure jitter accurately , most measurement equipment require continuous stream of patterns
- Once data is captured in “measurement equipment memory” various computations can be done
- There is a need to have simple arrangement which can
  - measure transmit jitter at both OLT & ONU
  - distinguishes between clock and data patterns
  - exercises realistic clock and data paths
  - leverages features of jitter analyzing scopes

SerDes DFT Setup for TP1 and TP5 measurements



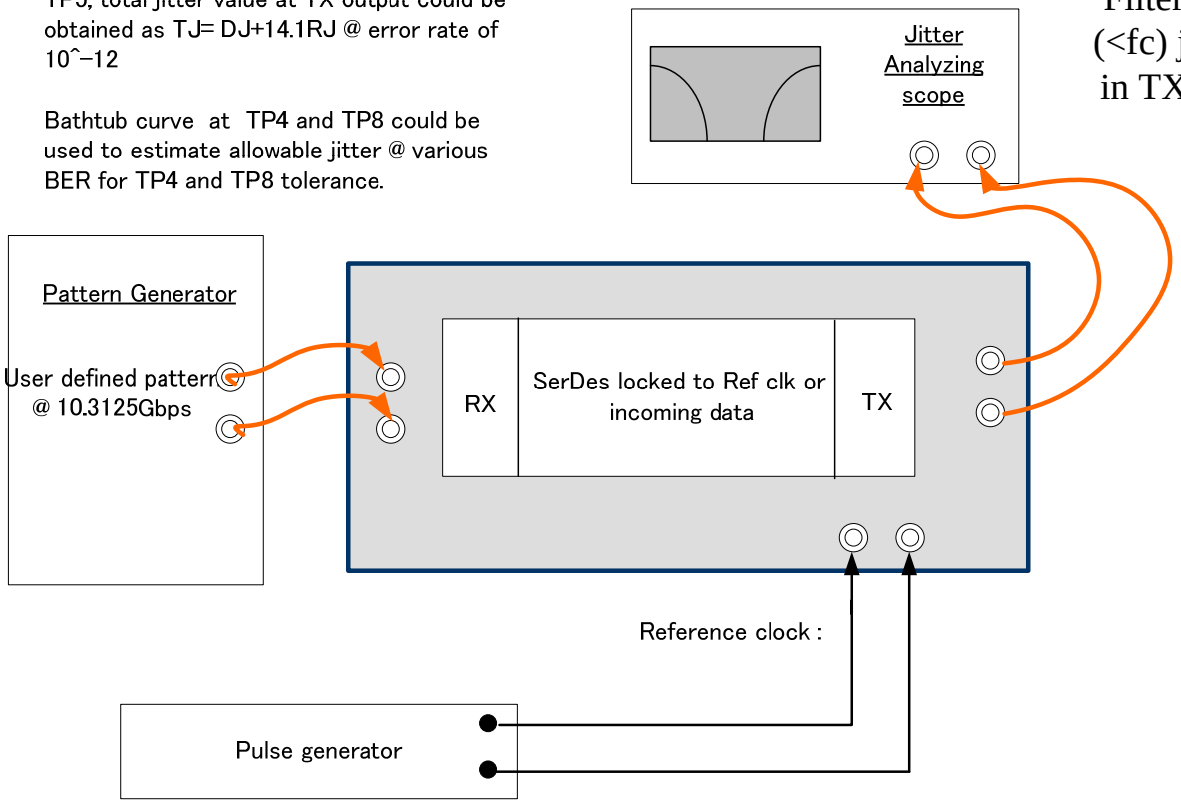
SerDes Bench measurement setup for TP1 and TP5 jitter measurement

This setup could extract following information through bathtub curve measurements at TP1 and TP5

From Bathtub curve measured at TP1 and TP5, total jitter value at TX output could be obtained as TJ= DJ+14.1RJ @ error rate of 10^−12

Bathtub curve at TP4 and TP8 could be used to estimate allowable jitter @ various BER for TP4 and TP8 tolerance.

Filter low frequency (<fc) jitter componets in TX measurements



Note : Pattern generator and ref clock generator synchronized with some frequency offset.
Oscilloscope is triggered on incoming pattern.

Proposal

- Provide programmable pattern generator in OLT and ONU
  - clock pattern to capture preamble characteristics
  - data pattern to capture payload characteristics
  - continuous stream to make accurate measurements
  - Jitter contributions for f<fc should be ignored
- Once data is stored
  - Dj, Rj can be used to compute Tj @ specified BER
  - Bath tub curve could be used to define allowable jitter tolerance at specified BER.
- All jitter budgets should be informative and be used as a guideline for component inter-operability

Straw Poll

- Programmable pattern generator to be included in OLT and ONU to allow realistic jitter measurements

Yes _____

No _____

No comment _____