



10GEPON Jitter Budget

Ad-Hoc Group Report

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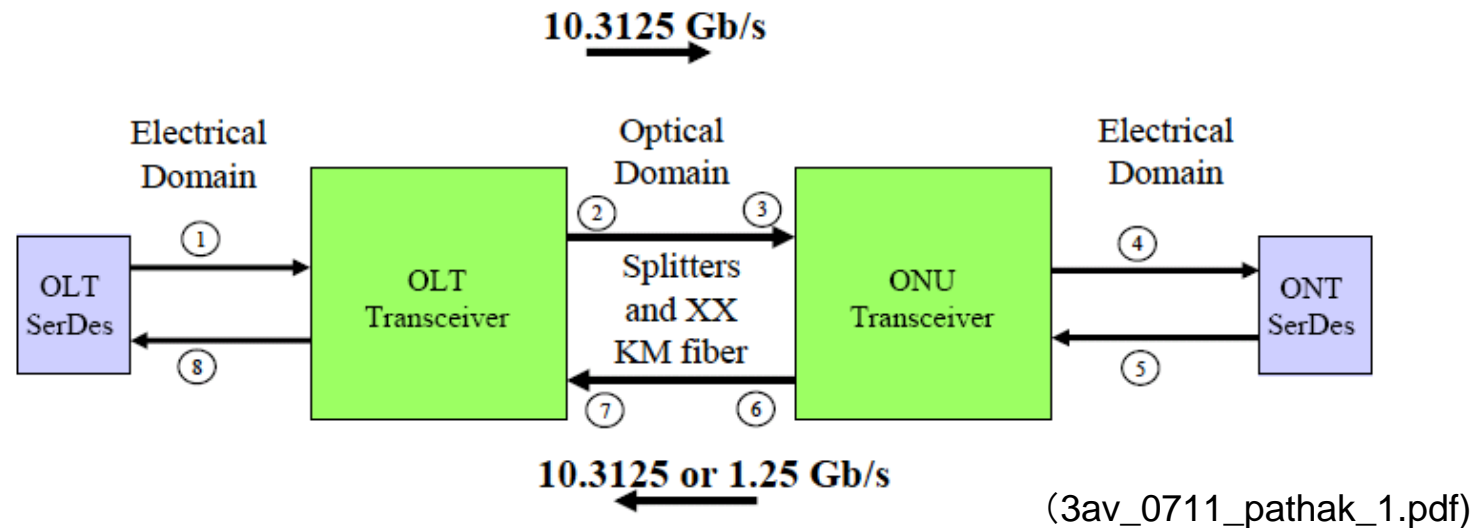


Jitter Budget Ad-hoc group attendees

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Ryan Hirth	Teknovus
Eric Lynskey	Teknovus
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Shinji Tsuji	Sumitomo Electric
Naoki Suzuki	Mitsubishi Electric
Seiji Kozaki	Mitsubishi Electric
Takeshi Nagahori	NEC
Hiroshi Hamano	Fujitsu Laboratories
Jessica Xin Jiang	Salira System Inc
Bidyut Parruck	Cortina Systems

Objective

- Objective of the group is to define preliminary values for test points TP1-TP4 and TP5-TP8 in the jitter reference model



Approach

- Group started with 3av_0803_haim_1 and decided the test points TP4A and TP8A are beyond the scope of this group. However the spread sheet presented by Haim is a good starting point for studying jitter contributions from multiple sources
- Circuit techniques such as pre-emphasis and receiver equalization that may be required to achieve the proposed jitter budget is a matter of implementation and not part of standardization process
- Proposed jitter values are based on part simulated and part actual results and may be changed at a later date on the **strength of supporting data**
- Upstream jitter budget for PRX10, PRX20, PRX30 is assumed to be same as IEEE802.3ah ref. Table 60-11

Table 91-aa 10GBASE-PR10, PR20, PR30, PRX10, PRX20, PRX30 downstream jitter budgets (informative)

Reference Point	Total Jitter pk-pk (ps)	Total Jitter (UI)
TP1	24	0.25
TP2	34	0.35
TP3	53	0.55
TP4	68	0.70

Notes

- a. These are preliminary jitter values based on simulations @ BER=1E-12 and need to be finalized**
- b. All jitter values relate to high frequency (>4 MHz) jitter**
- c. 0.1 UI of sinusoidal jitter stress is assumed at the receiver**
- d. The Gaussian jitter is assumed to be weak function of BER**
- e. In downstream external modulator is assumed**
- f. Transmit Eye mask needs to be added later on**

Table 91-bb 10GBASE-PR10, PR20, PR30 upstream jitter budgets (informative)

Reference Point	Total Jitter pk-pk (ps)	Total Jitter (UI)
TP5	24	0.25
TP6	39	0.40
TP7	48	0.50
TP8	68	0.70

Notes

- a. These are preliminary jitter values based on simulations @ BER=1E-12 and need to be finalized**
- b. All jitter values relate to high frequency (>4 MHz) jitter**
- c. 0.1 UI of sinusoidal jitter stress is assumed for the receiver**
- d. The Gaussian jitter is assumed to be weak function of BER**
- e. In Upstream direction direct modulator is assumed**
- f. Transmit Eye mask needs to be added later on**

Table 91-cc 10GBASE-PRX10, PRX20, PRX30 Upstream jitter budgets 1G (informative)

Reference Point	Total Jitter pk-pk (ps)	Total Jitter (UI)
TP1	192	0.24
TP2	320	0.40
TP3	392	0.49
TP4	536	0.67

Notes

a. These numbers are reproduced from IEEE802.3ah specifications Table 60-11 and may be revised if supported by new data .

b. Transmit eye mask similar to IEEE802.3ah specifications needs to be added

Conclusions

- Finalizing jitter budgets will be a long process and would require supportive data from transceiver and SerDes components
- Downstream and Upstream jitter values listed here are similar to OIFs CEI-11G-SR specifications for TP4 and TP8 values. Also in UI terms they are similar to 1G EPON specifications
- Transmit Eye masks need to be added after supportive data
- We now have a baseline jitter specs to develop solutions and revisit these numbers at a later date.
- Thanks to everyone who contributed to the generation of these specs.