Measured Jitter Tolerance of 10 Gbit/s Transponder Modules and Related Penalties

Presentation for

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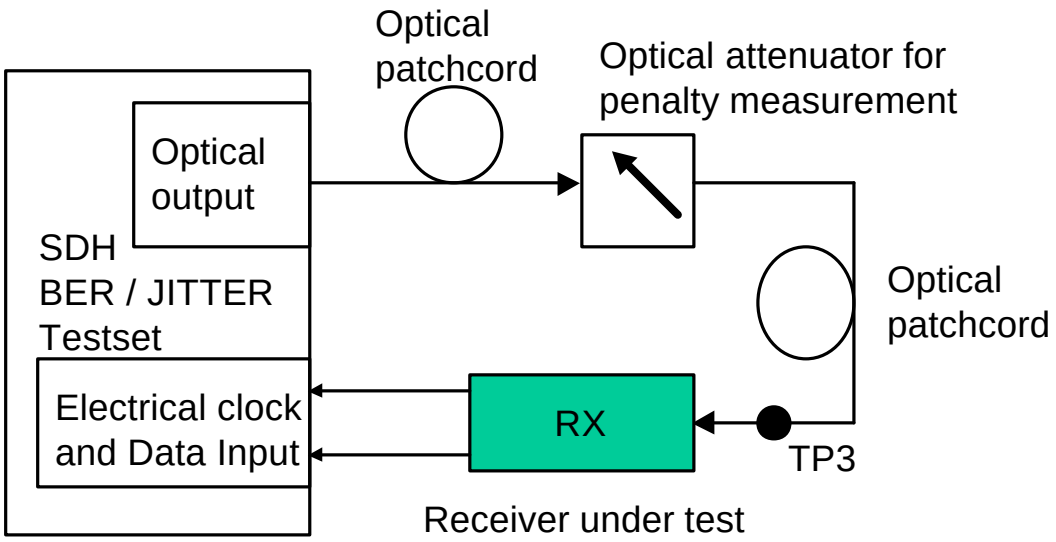
Background for jitter tolerance evaluation

- The tolerance values in 802.3 are significantly higher than in SDH
- The penalty related to the given P-P jitter has to be considered for the sensitivity, as the stressed sensitivity is given with jitter
- The feasibility investigation at 1550 nm has been done without extra jitter (Only path penalty has been confirmed , the horizontal portion of which is however part of the jitter spec following the 802.3 method)

Configuration



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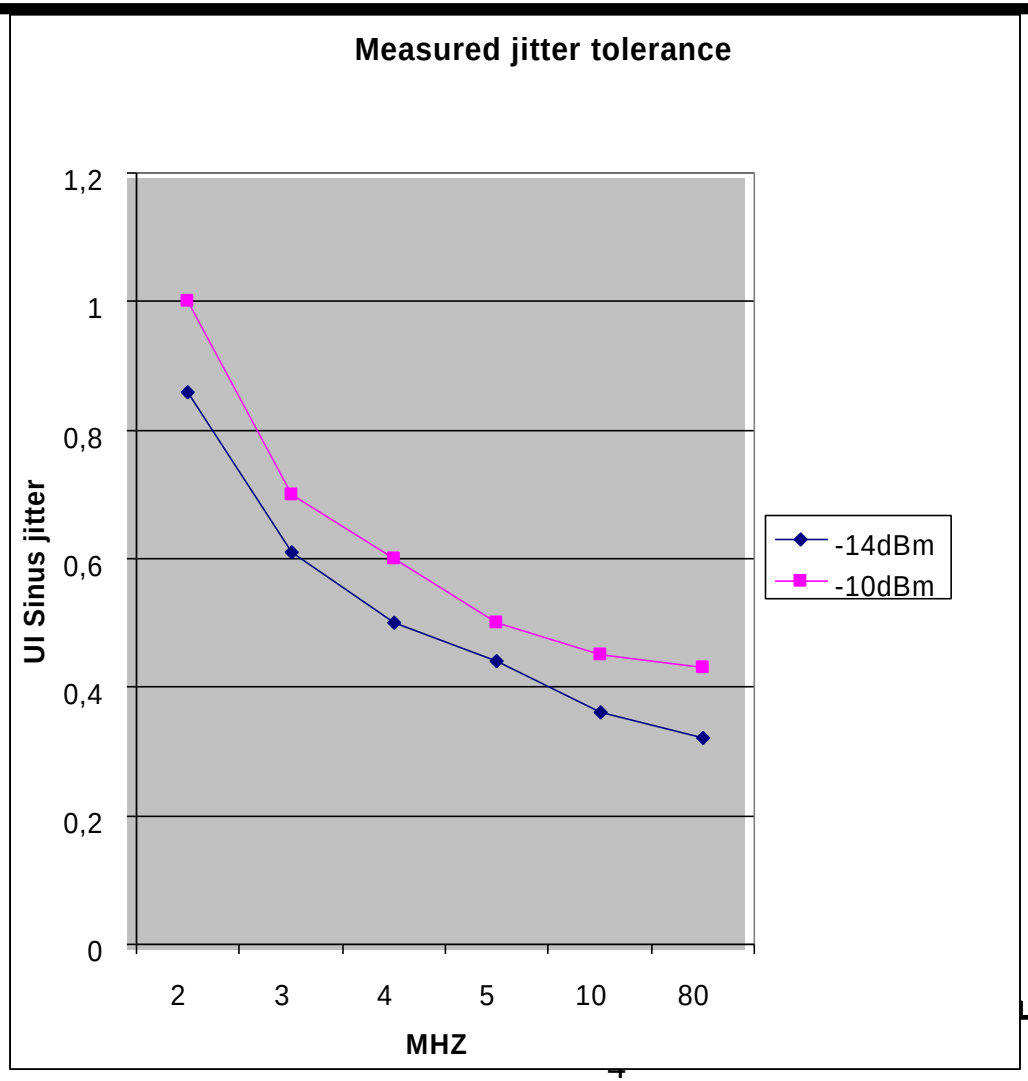
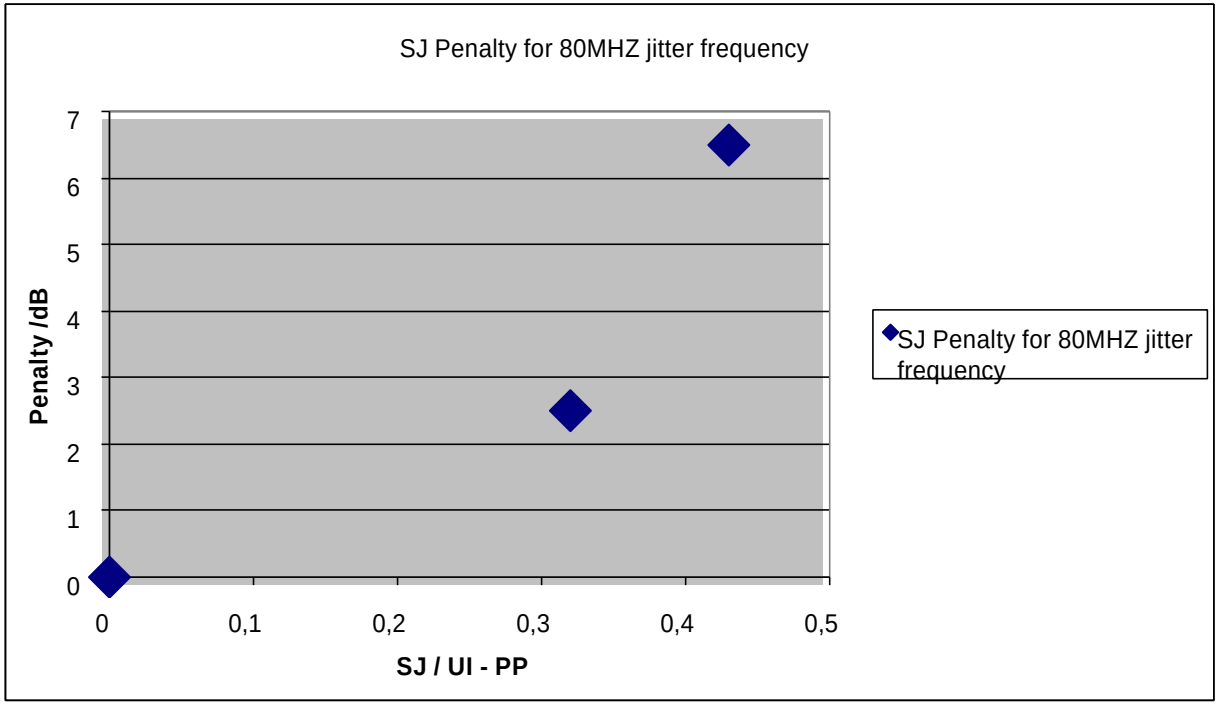
Measured Jitter tolerance (BER=10^{-12}) over sinus jitter frequency



Measured sensitivity penalty versus input Jitter @ BER 10^{-12} and 80 MHZ sinus jitter frequency



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Conclusion for 10G Ethernet Phy

- **Upper total BOL, Room temperature, Lab environment limit is a bit above approximately 0.4 UI for different commercial transponders**
- **Jitter penalty value of SDH spec is confirmed (Less 1 dB penalty @ 0.15 UI- PP sinus jitter)**
- **PP jitter of 0.35/0.3 UI PP lead to penalty of ~3dB/2.5dB**
- **Specification of jitter parameters needs to be revised to allow use of component technology available on the market.**
  - **There is room for 2 dB total penalty between verified sensitivity without jitter incl. margins and the stressed sensitivity which should include jitter and vertical eye mask penalty.**
    This means maximum PP jitter has to be reduced significantly.

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