Interference Tolerance simulations

Magesh Valliappan

Overview

- Salz SNR based analysis
- Simulation results with DCD and rise time variation
- Effect of cresting factor of crosstalk

ICR plot

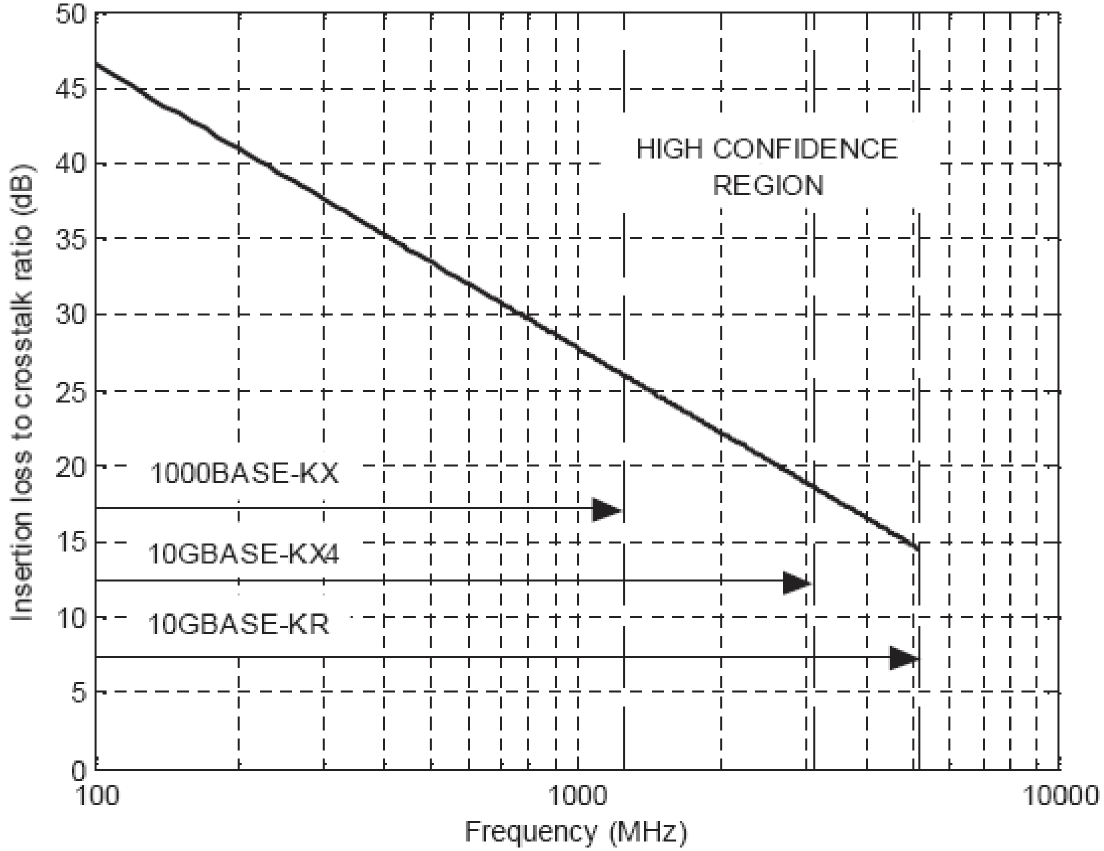

Figure 69B–1—Insertion loss to crosstalk ratio limit

Salz SNR analysis

- Salz SNR –
  - SNR of optimal FFE/DFE linear receiver in PAM system in the presence of only additive gaussian noise
  - Mean(20*log10(1+folded_SNR)) over the frequencies within Fs/2
    - Folded SNR obtained by aliasing the linear SNR
  - Published in IEEE journal paper & used in multiple standards for feasibility analysis
  - ICRmin = SNR versus frequency for similar thru and aggressor PHYs
  - Salz SNR = 23.5dB
  - Salz SNR with increased crosstalk amplitude = 20.0dB
  - Salz SNR with same amplitude and ~2.5dB equalization difference = 22.0dB
  - Split rise time effect – TBD
  - No margin left for implementation
  - 9.6mV RMS with Charles' XTLK PSD is not feasible
  - 6.4mV RMS may have margin, but DJ, DCD, RJ, finite DFE, finite FFE or equivalent needs budget….
  - DSL standards required 6dB Salz margin in theoretical analysis

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Broadband noise results

- Noise spectrum is flat to 10G
- DCD = 0, noise RMS = 4.6mV RMS
- DCD = 0.035UIpp, noise RMS = 4.2mV RMS

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Cresting factor

- Cresting factor of crosstalk is less than that of gaussian noise
- Reduce RMS gaussian noise to compensate
- Expect a factor of about ~ 1.25

Conclusion

- Use 4.2mV RMS for EIT test
  - Include factor of 1.25 for equalization difference between Thru and XTLK
  - Include factor of 1.25 for cresting factor of crosstalk relative to gaussian

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