SAS-2 Interconnect Signal-to-Noise Ratio Study (07-484r0)

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(11/5/2007)

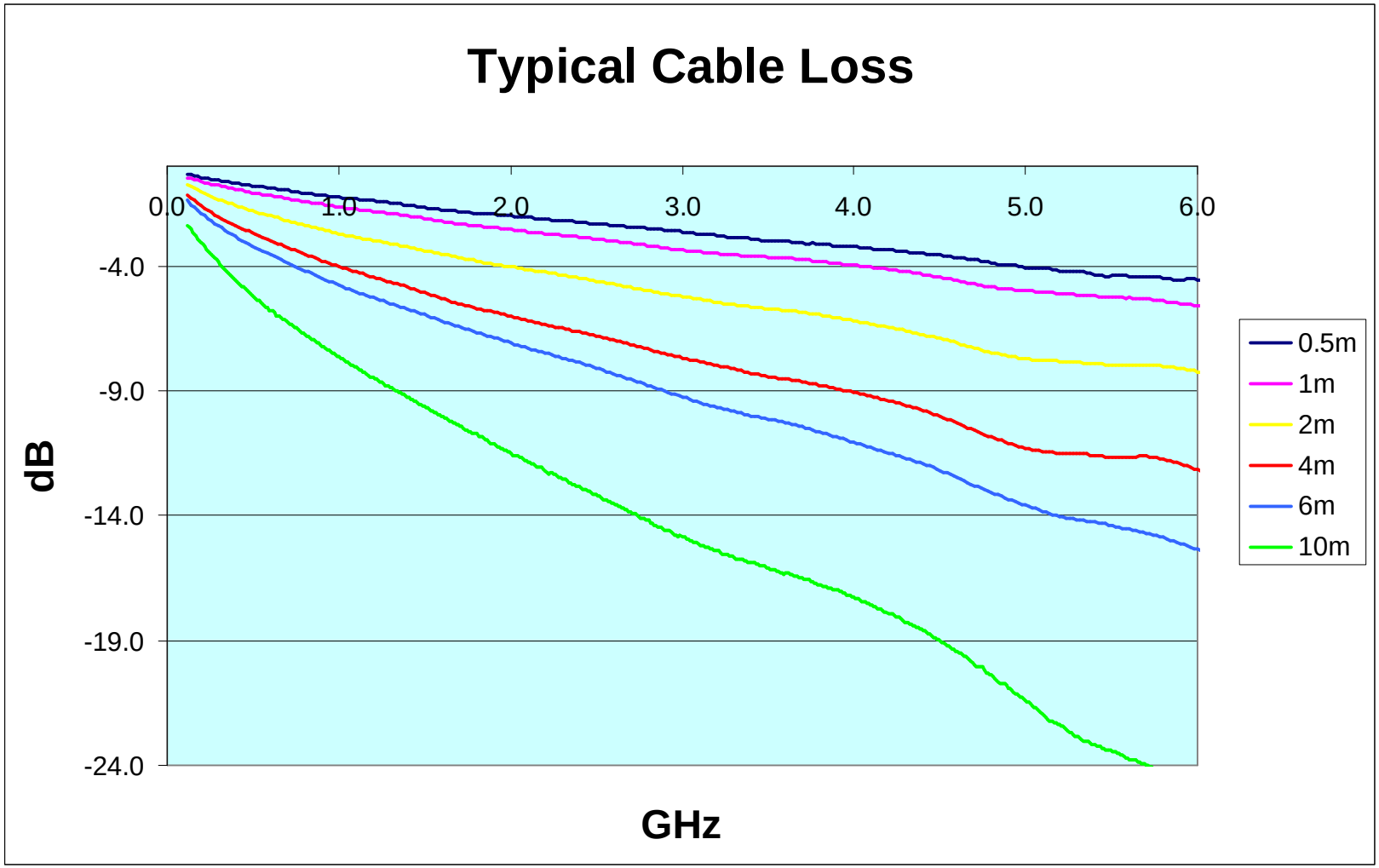
Issue

- While SAS-I and SAS-II specify crosstalk limits on some connector interfaces no guidance is provided for other components or to those involved in system integration
- Crosstalk limit lines are also problematic. Short cables tend to have higher levels of crosstalk but can deliver most of the signal to the load. Long cables deliver only a small portion of the signal to the load but may have low crosstalk levels.
- Is an “insertion loss to crosstalk ratio” specification a more appropriate way to control crosstalk?

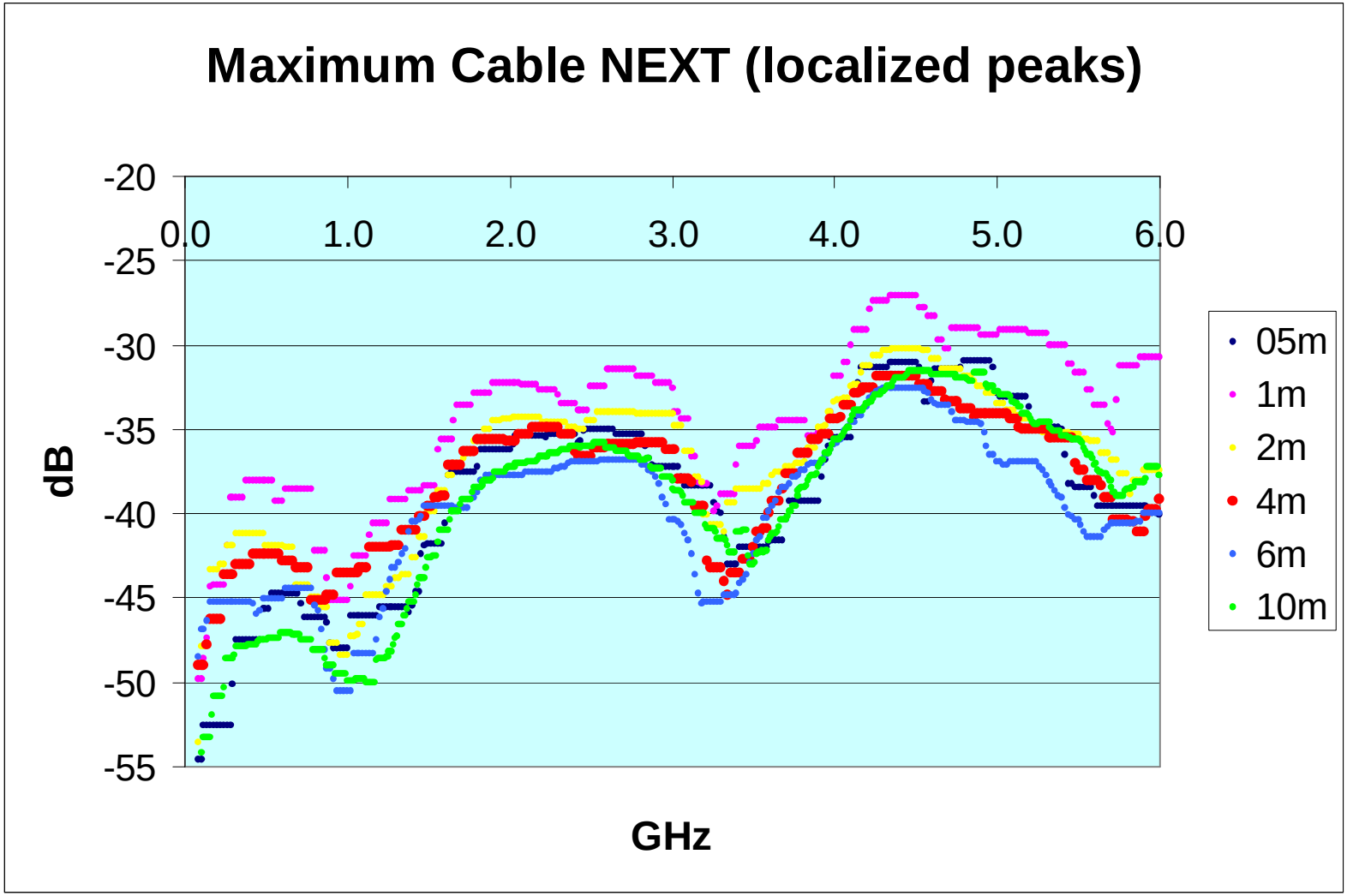
Measurements

- A sampling of cables lengths from 0.5 to 10 meters is first characterized for crosstalk and insertion loss.
- The data is then processed to estimate the insertion loss to crosstalk ratio from 100MHz to 6GHz

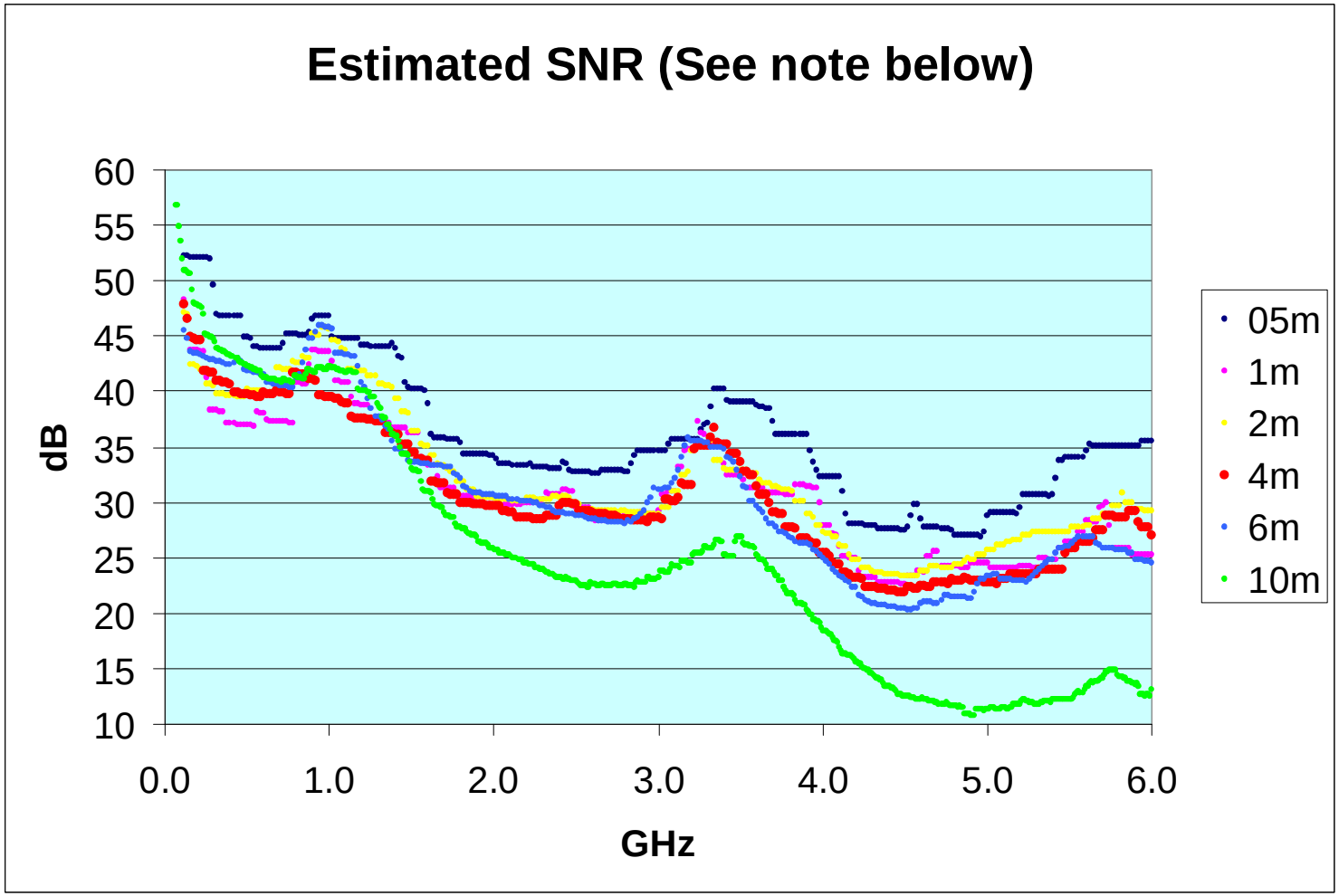
Typical Insertion Loss



Cable NEXT (Smoothed by using peak value in sliding window)



Estimated Insertion Loss to NEXT ratio



The crosstalk curves used to derive this estimate may include a resonance response. Frequencies where the resonances cancel out will still be problematic for digital signaling

Conclusions

- Using this type of approach for noise will not penalize short interconnect.
- Also, an SNR type of specification will encourage those developing lossy interconnects (10m cable or more) to focus on minimizing crosstalk.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