

High Speed Copper Cabling for HSSG

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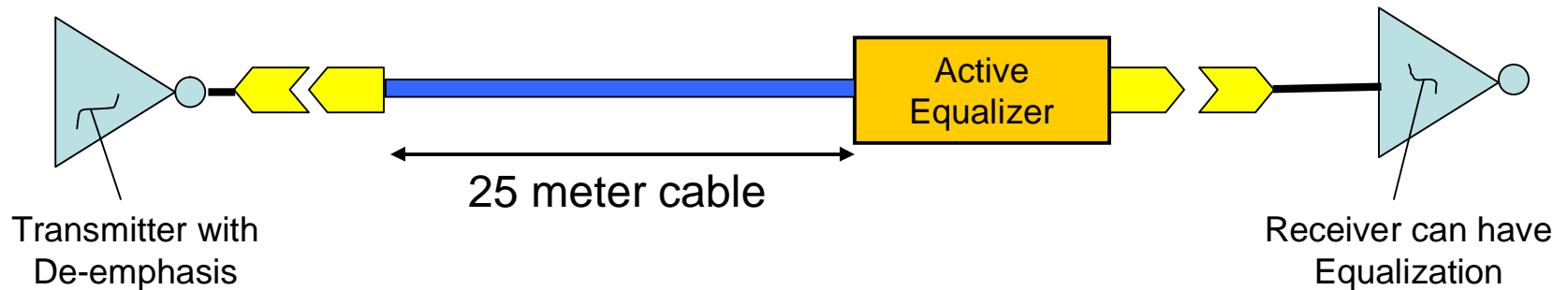
High Speed Copper Guidelines

Cables Should be characterized through at least the Fundamental Frequency of the Transmitted Signal

- Cabling must have predictable and smooth frequency response through greater than the fundamental frequency
- Insertion Loss of the assembly at the fundamental Frequency should not exceed 35 dB to work with Active EQ circuits
- Connector System must have better than -8dB return loss at the fundamental frequency
- Crosstalk should be below -40dB thru the fundamental frequency

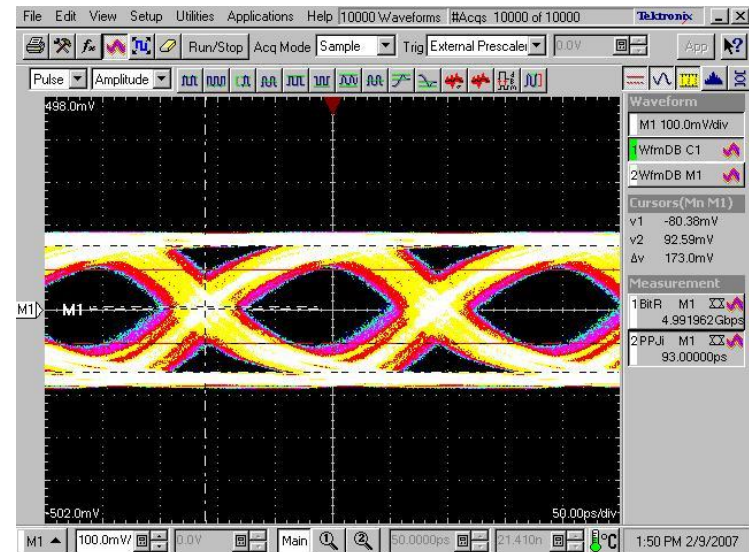
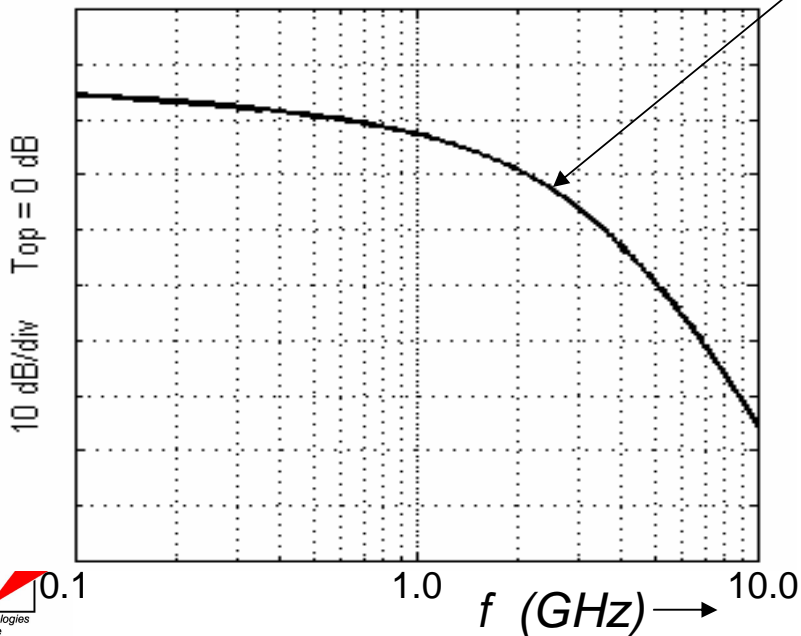
Extended Range InfiniBand Link

Operation at 5 Gb/sec available now



Insertion Loss @ 2.5 GHz
is about 35 dB

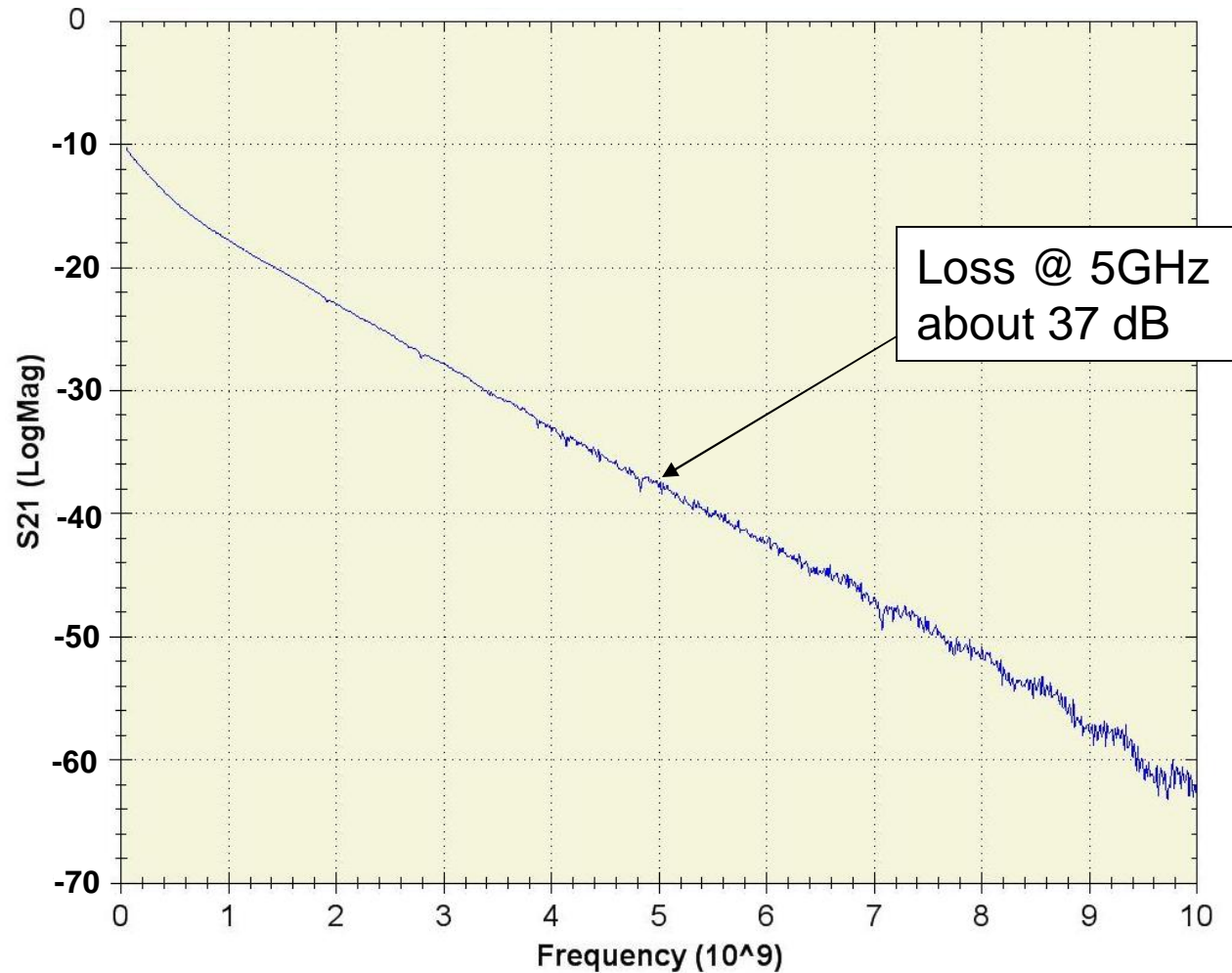
25m of AWG 26(1) 100 Ohm EO+ Twinax +



Error Free Data up to 6.25 Gb/sec
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Cable Assembly Insertion Loss

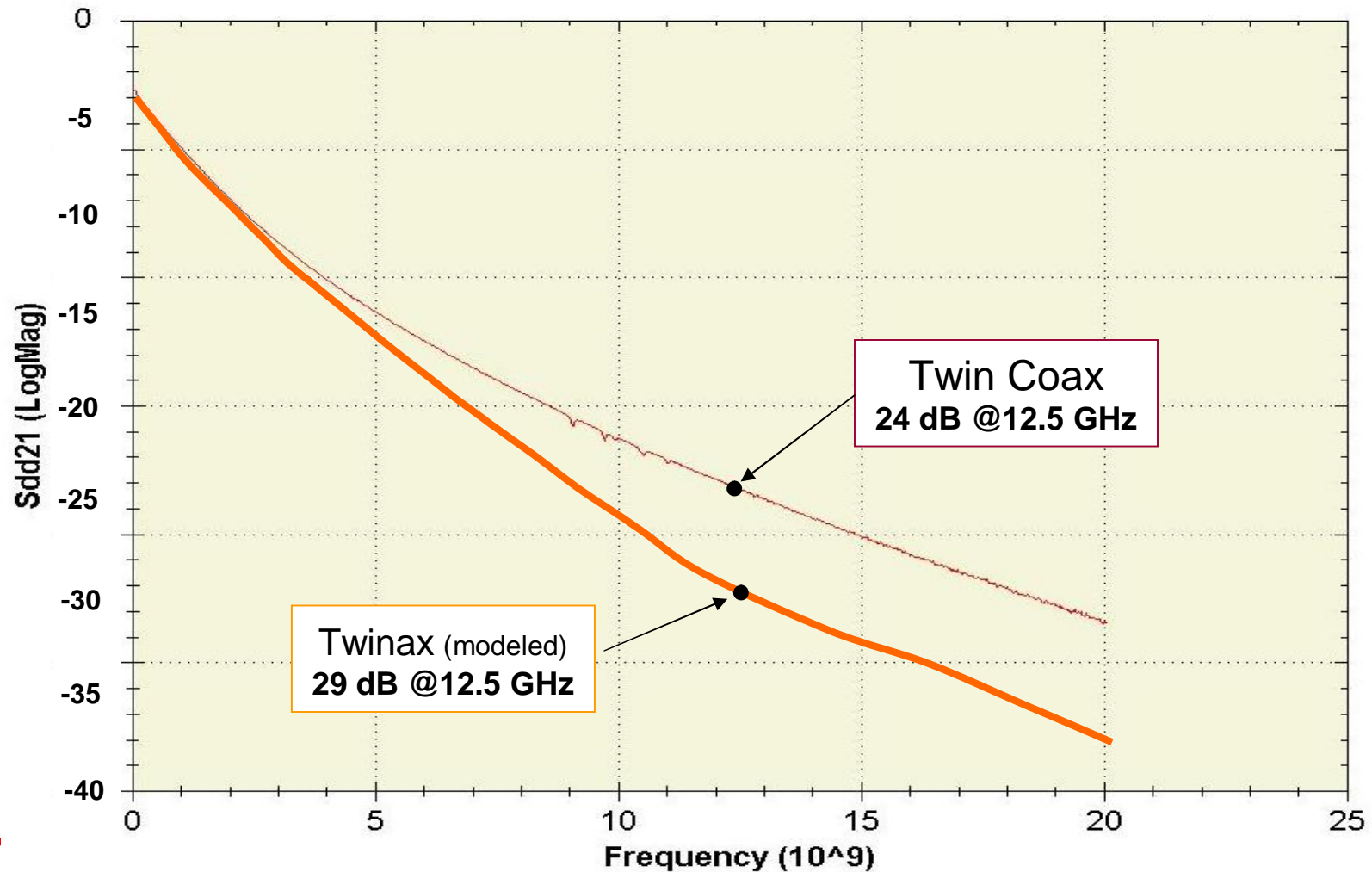
for 20 meter length AWG24 Twinax
Cable has been shown to work at 10 Gb/sec



Cable Designs for 25 Gb/sec

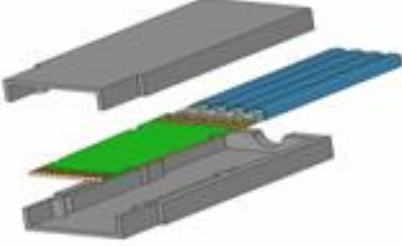

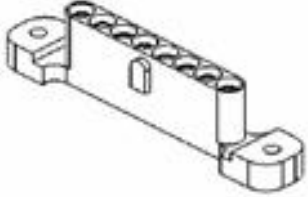
10 meter AWG24 loss comparisons

Coax has lower loss but twinax designs are improving and have smooth frequency response thru 15 GHz



Connector Types

Several design options are available which can meet the requirement

Connector Type	Crosstalk thru 15 GHz	Return loss thru 15 GHz	
	Card Edge	-40 dB	-5dB *
	Cable Adapted Backplane	-40dB	-8dB
	Multi-Coax Array	-45dB	-15dB

* Can be improved relatively easily

100 Gb/sec over Copper

Conclusions

- Current Cable and Connector Technology can meet the requirement using 10 lanes @ 10 Gb/sec
- Current Technologies for copper cabling can be scaled to meet higher data rates up to 25 Gb/sec using the same loss parameters
- Existing Coaxial Cabling solutions can meet the demand for 25 Gb/sec for demonstration purposes and low volume production
- Enhanced Twinax Cable and Connector Solutions can be available to meet the requirements for data rates of 25 Gb/sec

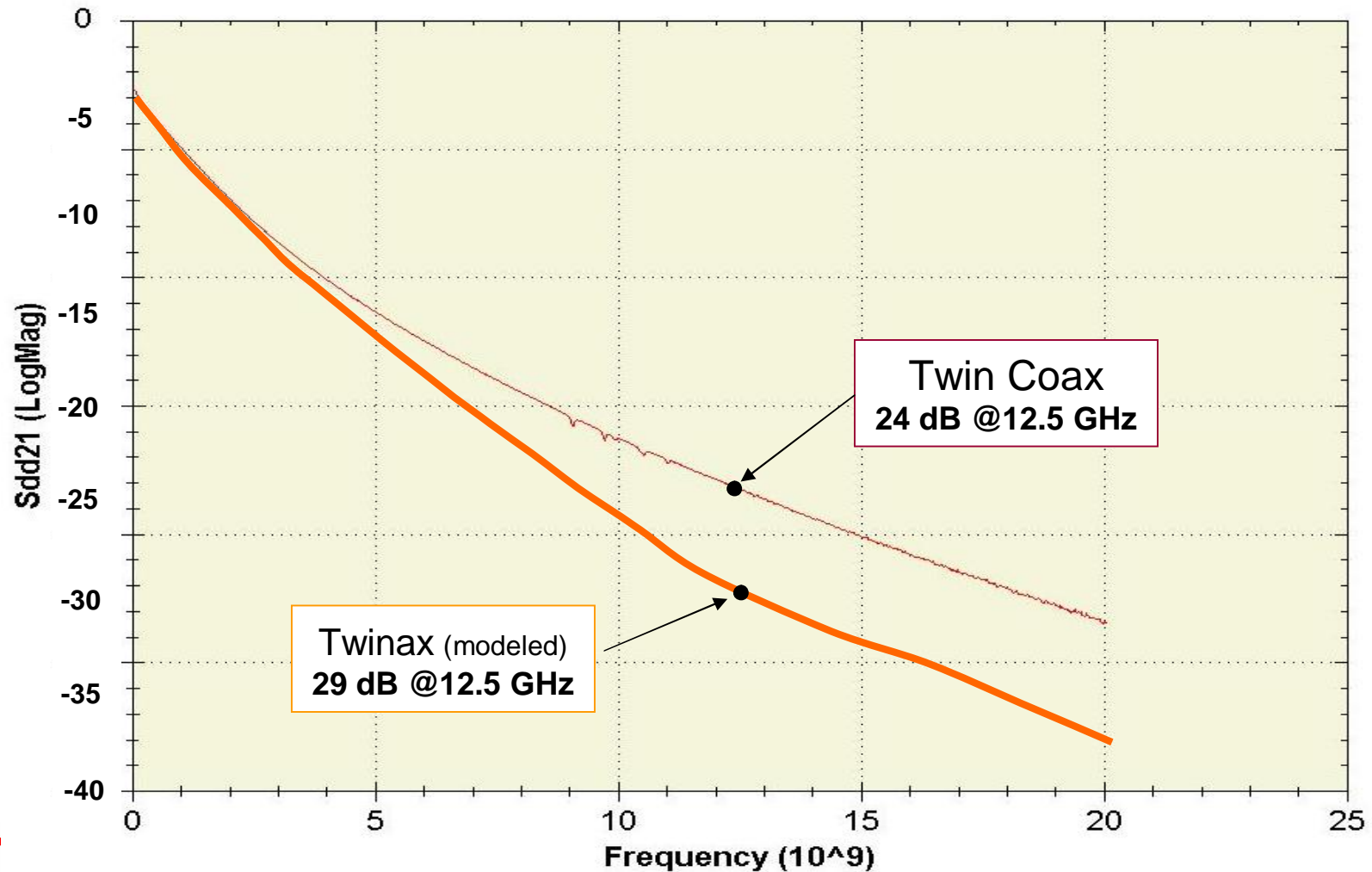


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