Channel Models

John D'Ambrosia, Tyco Electronics

Channel Ad Hoc Model

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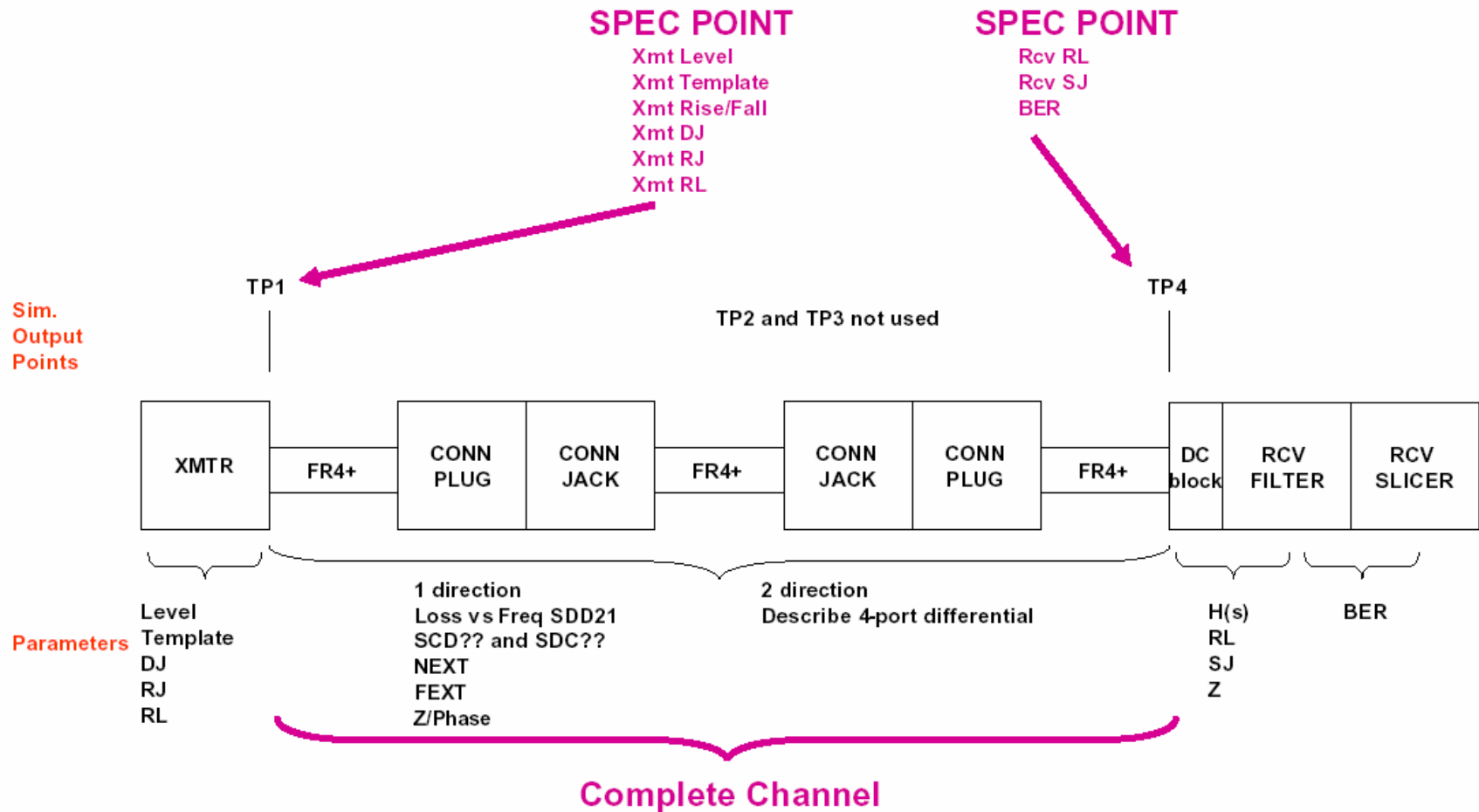
We Are Dealing with a Time-Varying Channel

SDD21

SDD21 offset for manufacturing factors

SDD21 including offset for manufacturing & environmental factors

SDD21 (dB)

Impact of manufacturing variation

2.5 GHz

SDD21
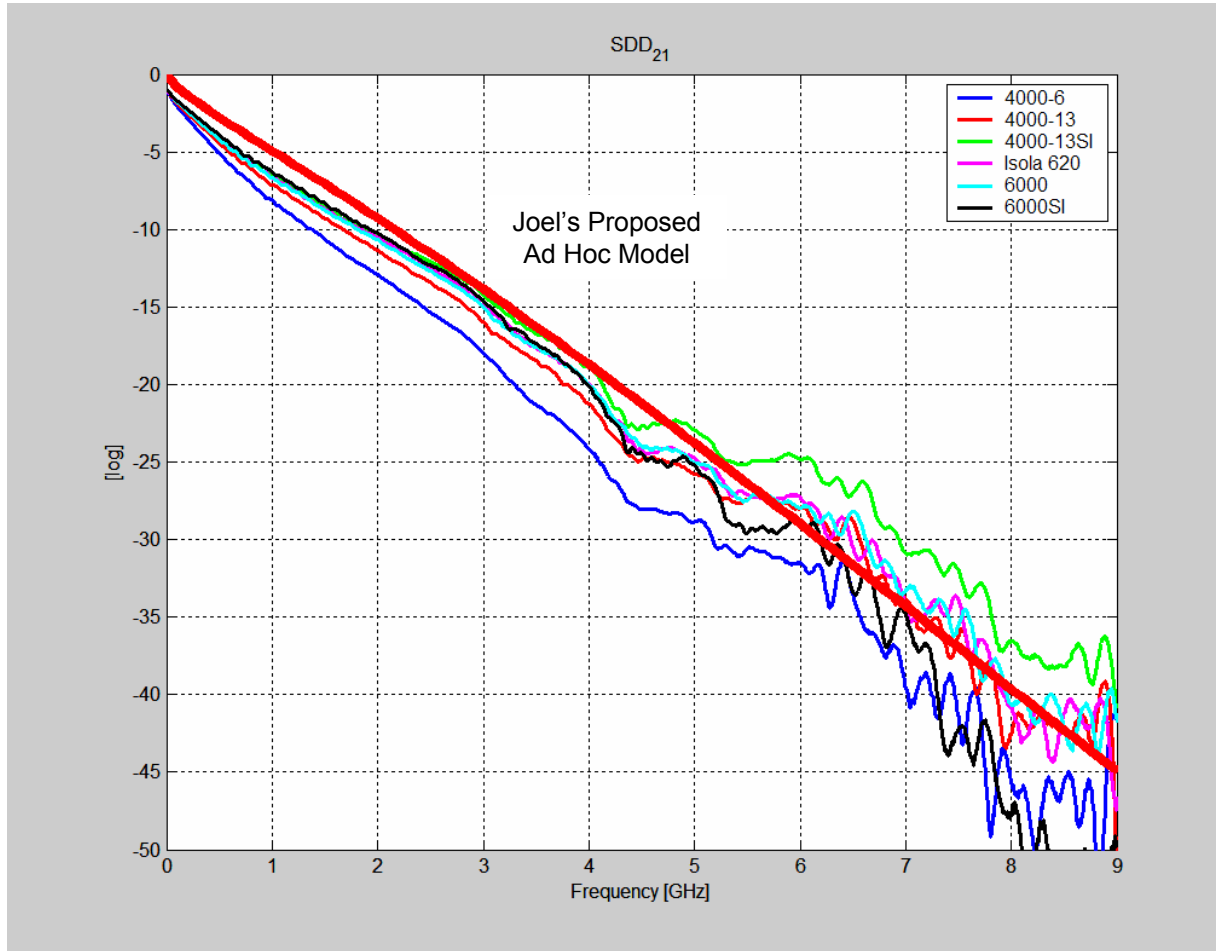
Impact of environmental variation

5.0 GHz

Design Target
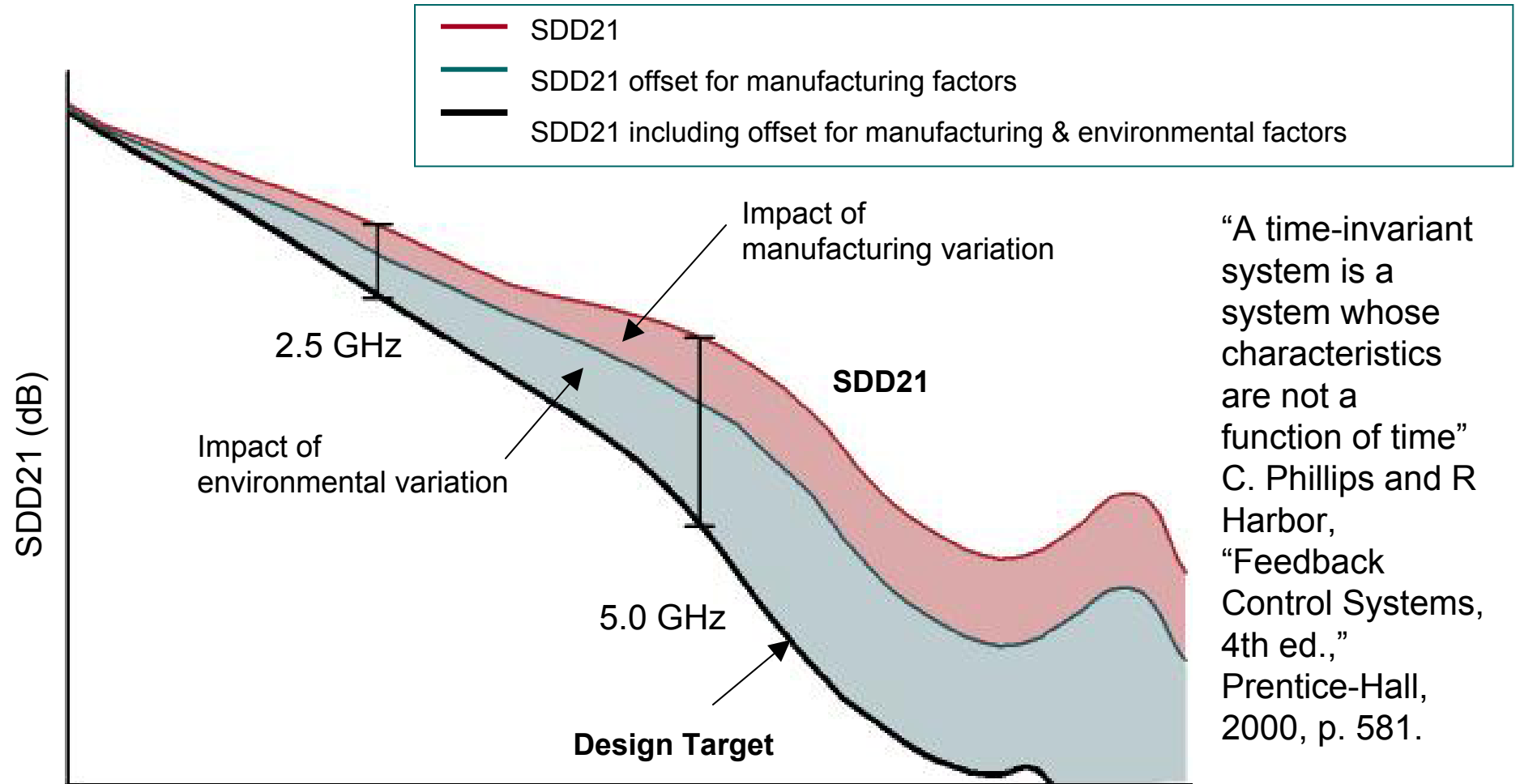
"A time-invariant system is a system whose characteristics are not a function of time" C. Phillips and R Harbor, "Feedback Control Systems, 4th ed.," Prentice-Hall, 2000, p. 581.

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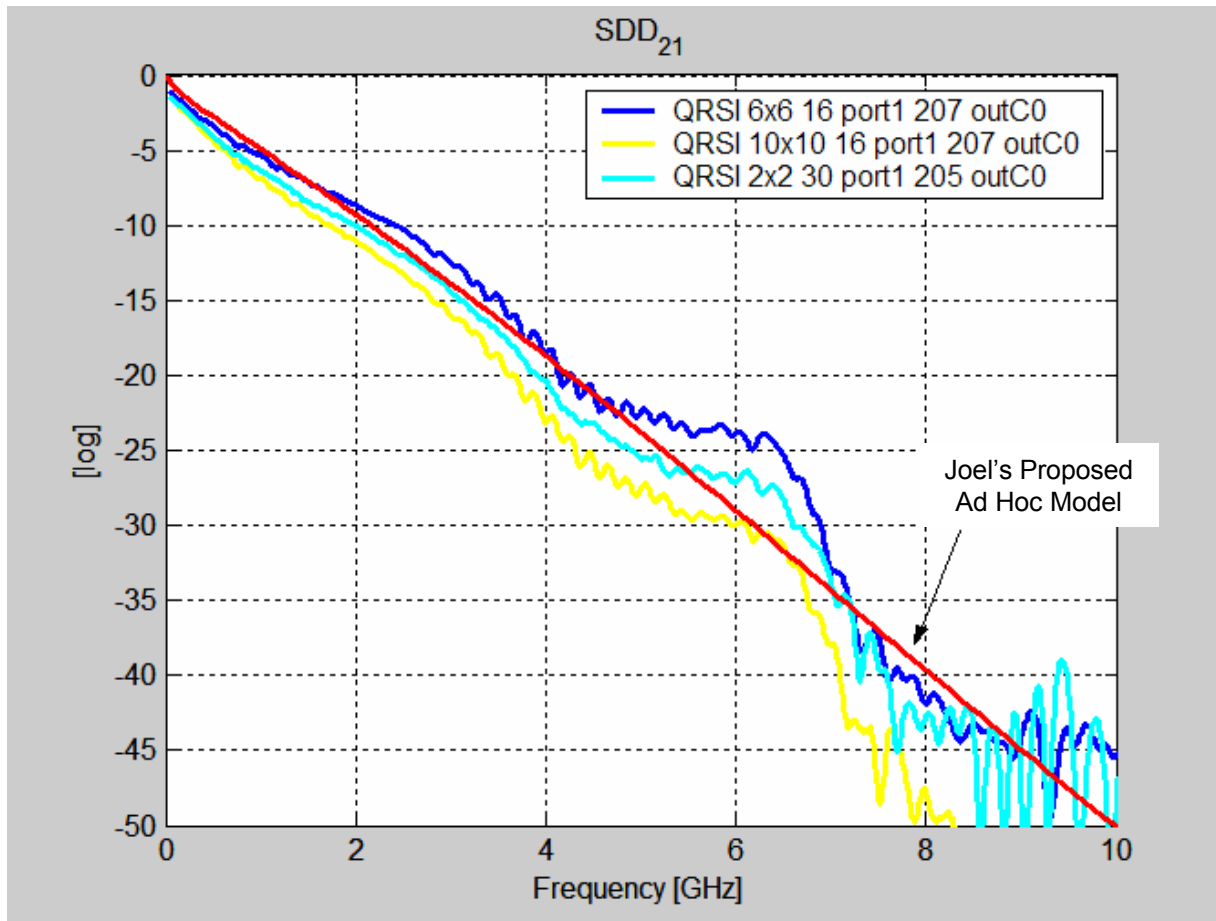# Proposed Ad Hoc SDD21 Channel Model
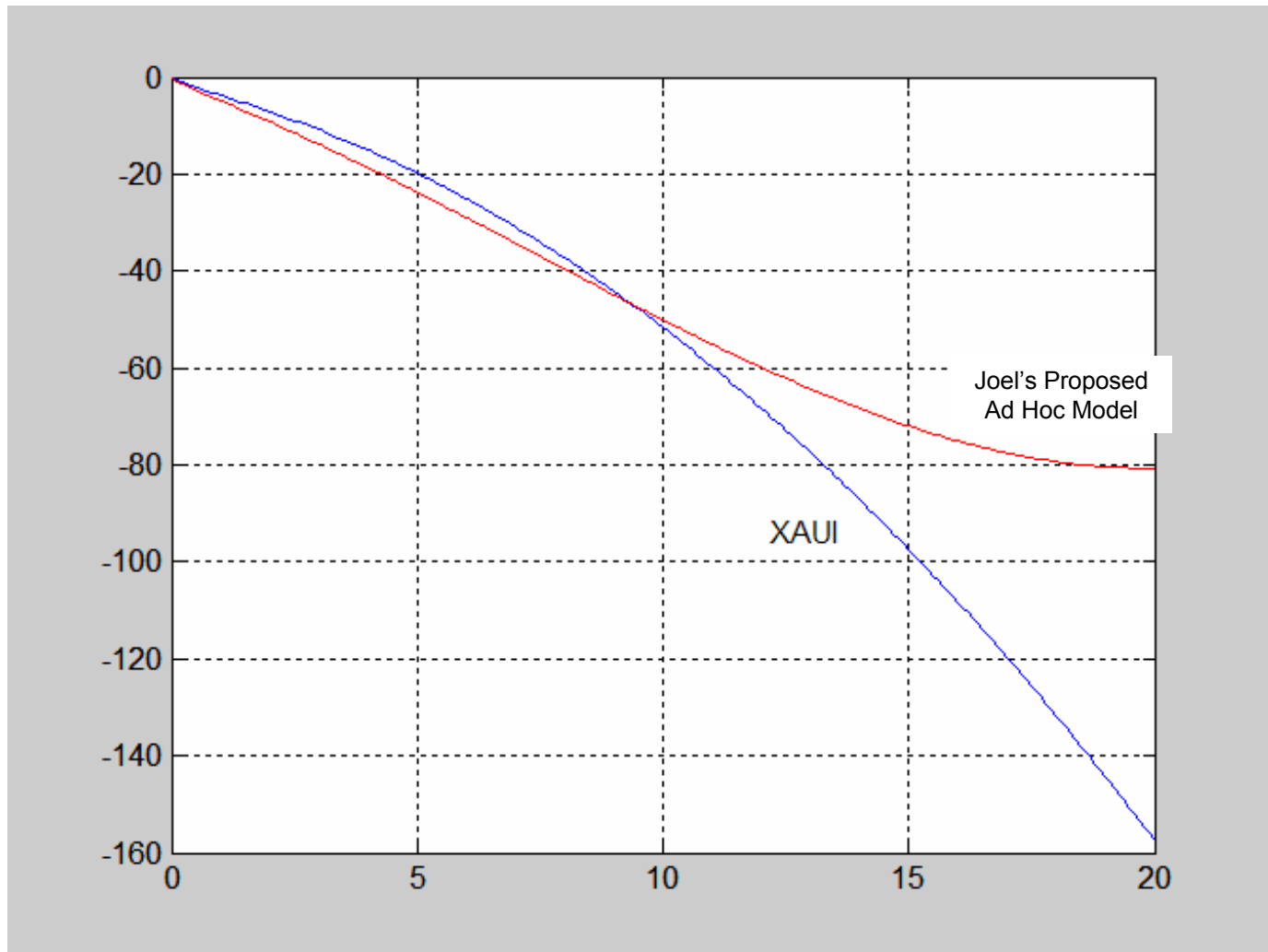
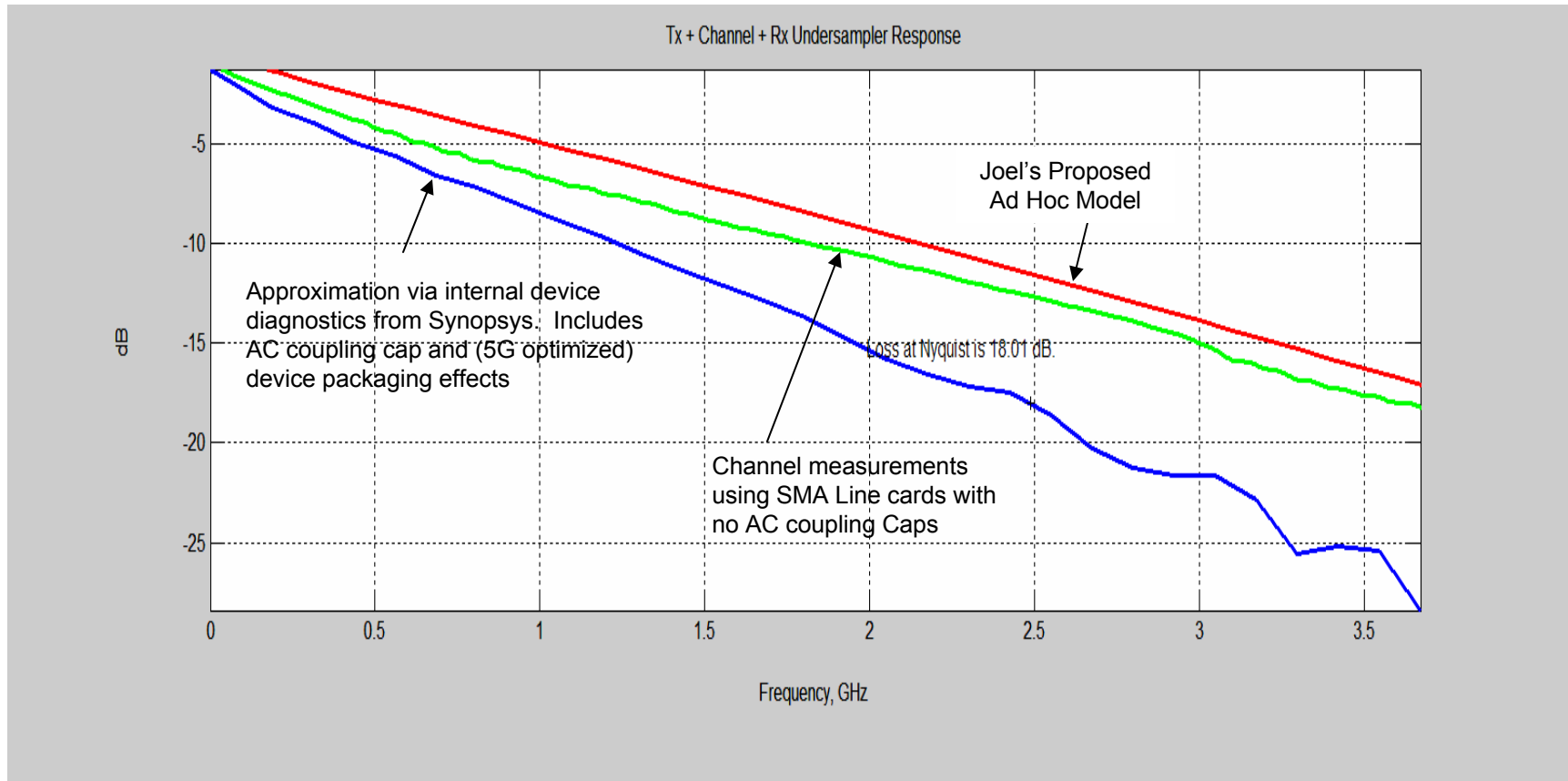# Different Materials – 34" Channels

- QuadRoute Backplanes

  - 4.75 mil wide traces on all but 4000-6 version (4mil wide)

- Uses HM-Zd SMA Line Card

  - 4000-2

  - 6 mil wide traces

- No Counterboring on HM-Zd connector

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Different Lengths

- QuadRoute Backplanes
  - 6000SI
  - 4.75 mil wide traces on
- HM-Zd SMA Line Card
  - 4000-6
  - 6 mil wide traces
- No Counterboring on HM-Zd connector
- Distribution of length on line cards / backplanes and associated materials important

Where We Define the Model…..

Tx + Channel + Rx Undersampler Response

Joel's Proposed
Ad Hoc Model

Approximation via internal device
diagnostics from Synopsys. Includes
AC coupling cap and (5G optimized)
device packaging effects

Loss at Nyquist is 18.01 dB.

Channel measurements
using SMA Line cards with
no AC coupling Caps

Frequency, GHz

dB

6000_Link3_Left_Channel0