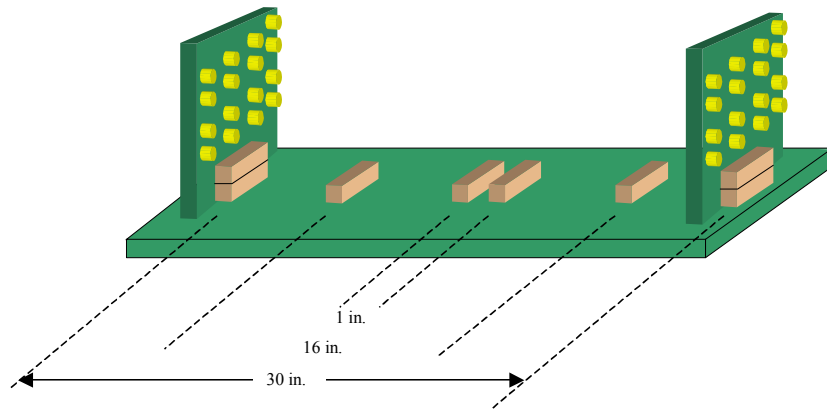

Channel Comparisons to Proposed Channel Model

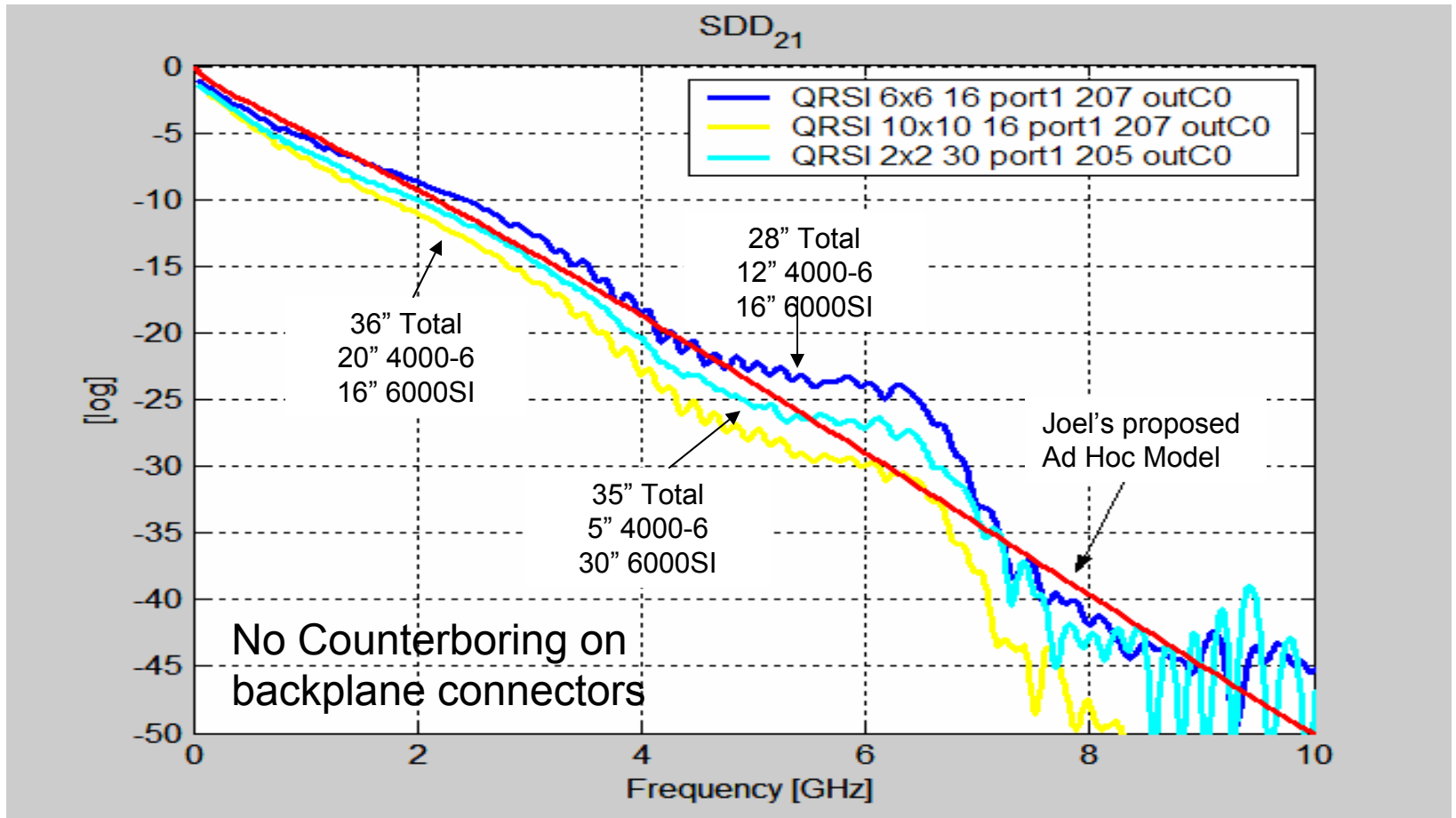
John D'Ambrosia
Tyco Electronics

Tyco Electronics - HM-Zd QuadRoute Test Platform



- ***SMA Line Cards***
 - Nelco 4000-6
 - 2.5", 6", and 10" trace
 - 6 mil trace width, 100 Ω Differential
 - 0.092" thickness
 - 4 Signal layers throughout board
- ***Platform #1 – HM-Zd QuadRoute Backplane***
 - Nelco 6000SI (highest performance material backplane tested with variable length line cards)
 - 2", 16", and 30" traces
 - 4.75 mil trace width
 - 0.125" thickness, 100 Ω Differential
 - 8 Signal layers throughout board
 - Same routing capacity as 16 signal layers
- ***No design optimization.***
- ***No counterboring at any of Z-PACK HM-Zd connector holes***

Model Comparison

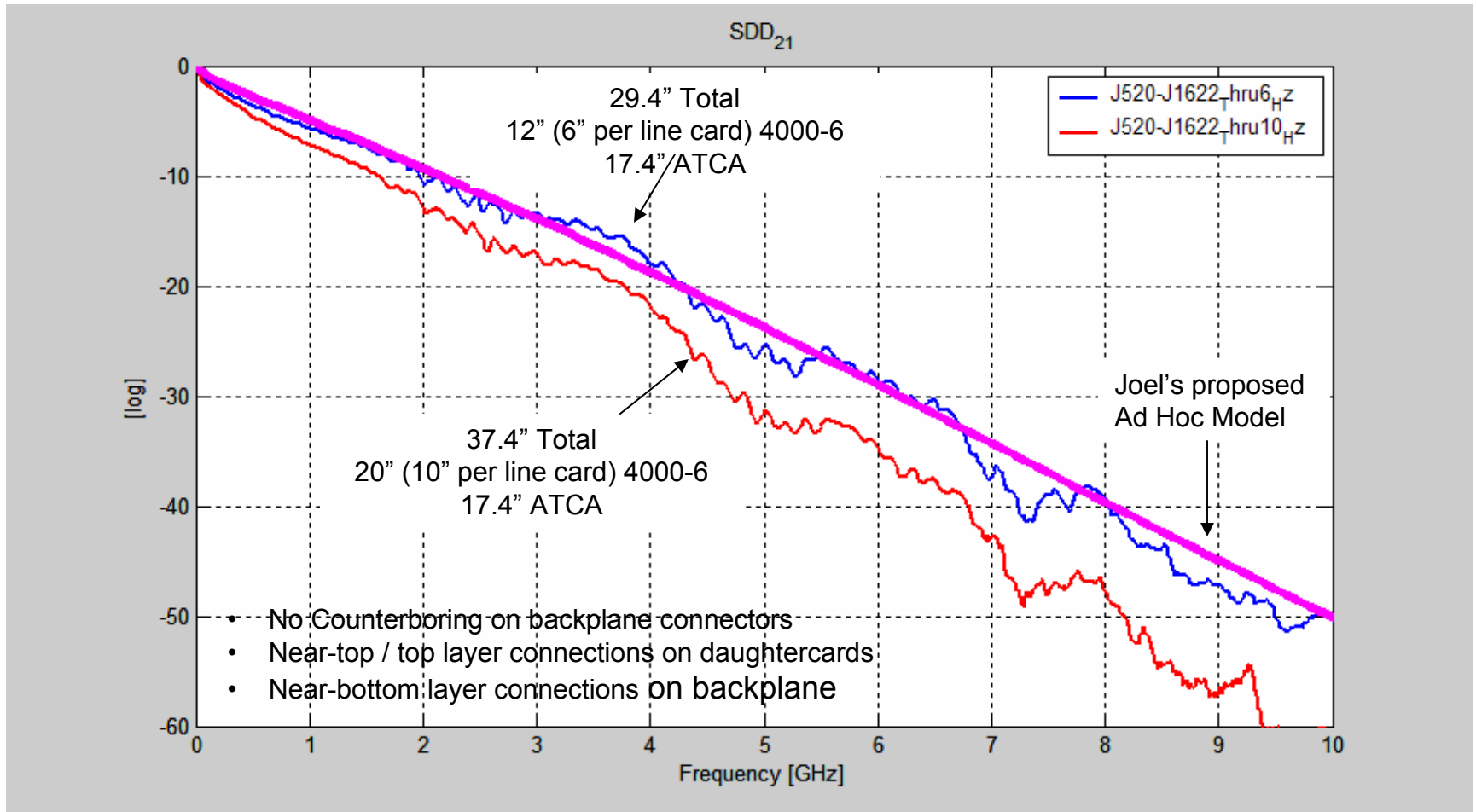


Relative Cost Related to Implementation

- Tyco Electronics HM-Zd QuadRoute Implementation
 - 4.75 mil wide traces
 - Routes 2 pair in-between signal columns
 - 20 layers board with 8 signal layers, 3.175mm
 - Same routing density as 36 layer design
 - Reduces stub effect
 - Approximate 5:1 aspect ratio
- Cost Comparison
 - 4000-13 – Material – 2x over 4000-6
 - Board Cost - Estimate 30% cost savings over 36 layer 4000-6 design
 - Typical panel size
 - Typical production quantity
- Kaparel
 - Full Mesh ATCA backplane using QuadRoute technique
 - 18 layers (4000-13SI)
 - No counterboring



Model Comparison



Conclusions

- Proposed Ad Hoc Model seems reasonable
 - QuadRoute Backplane
 - “Learning” platform for understanding channel behavior
 - Not optimized for length
 - No Counterboring
 - Lower frequency difference
 - Due to skin effect losses of thin traces
 - Anticipate at 1m that wider traces than 4.75 mils on backplane would be considered to be used
 - Length distribution of system on daughtercards makes material selection on daughtercards critical
 - ATCA 30” channel has approximately 1/3 length on line cards