FR408 Backplane: Enhanced 1 M Channels

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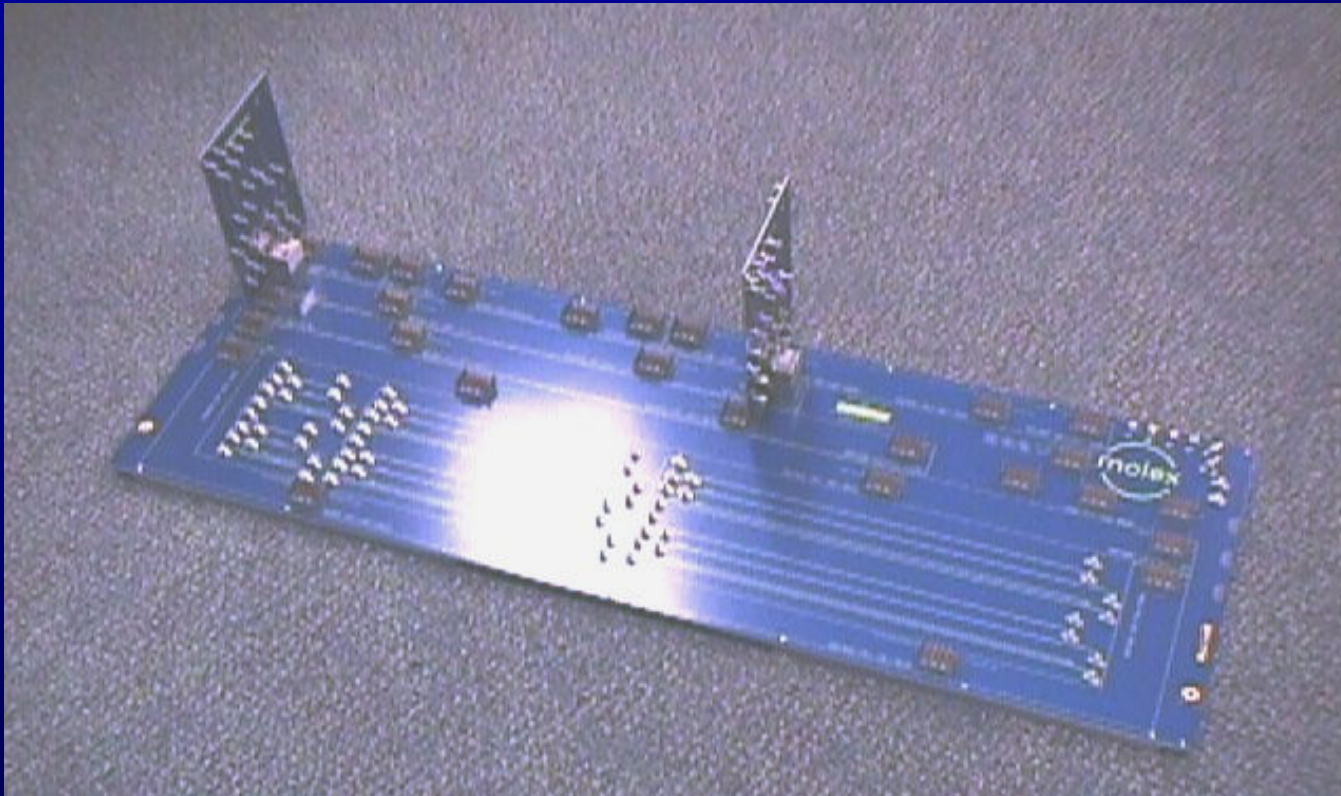
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Introduction

- **Isola FR408 reference backplane**
  - Test and demonstration vehicle
  - 1m electrically enhanced channels
  - Similar transmission performance as the standard GBX FR408 backplane, enhanced crosstalk performance

- **To aid the group by providing known performance variation, particularly to look at ICR**
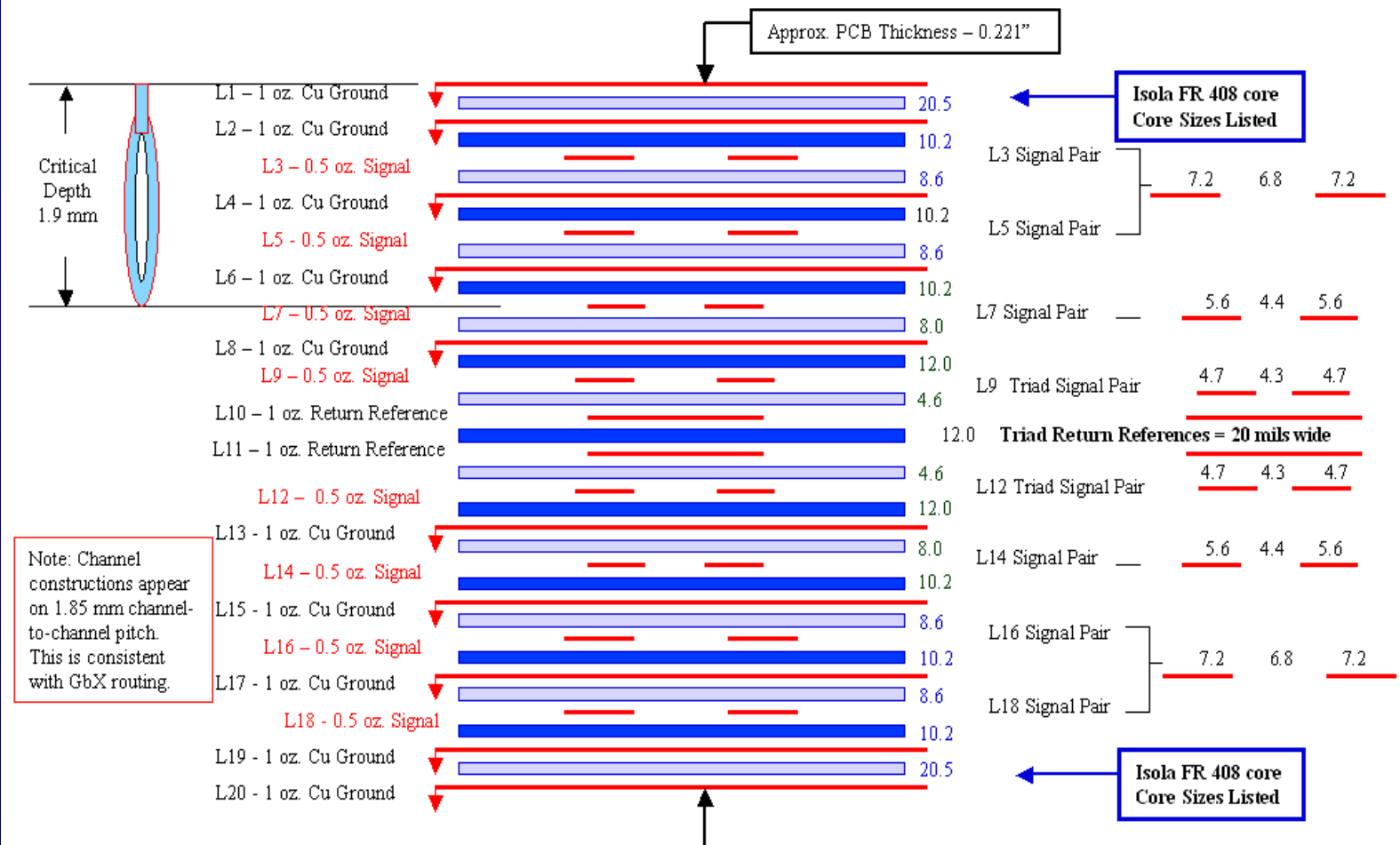
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Backplane

- **Overall length: 97 cm; overall width 33 cm**
- **Thickness: 5.7 mm**
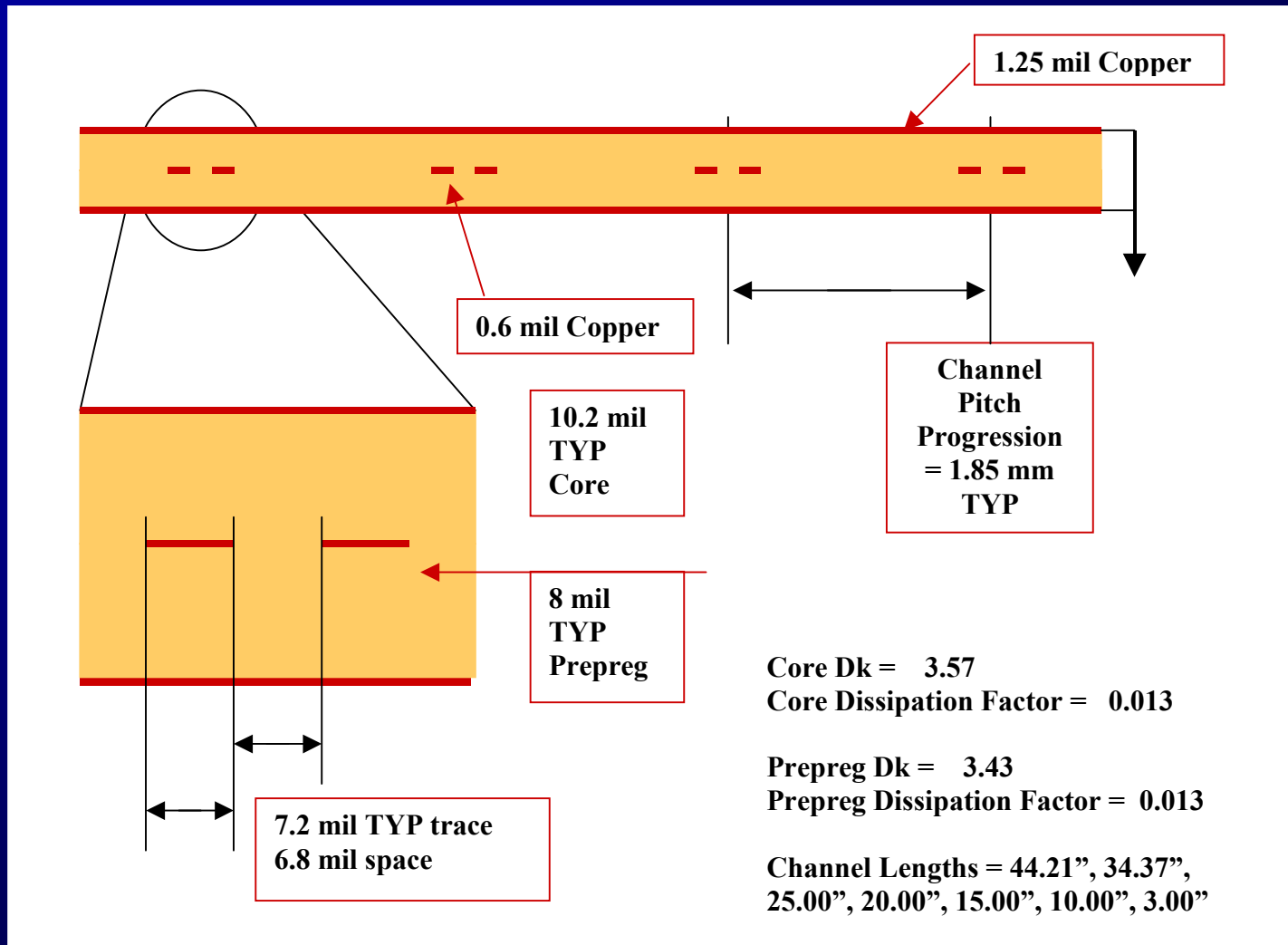- **1.85 mm channel pitch progression maintained over length of channel**

Backplane Construction

PCB Stack – Channel Construction Group 2A
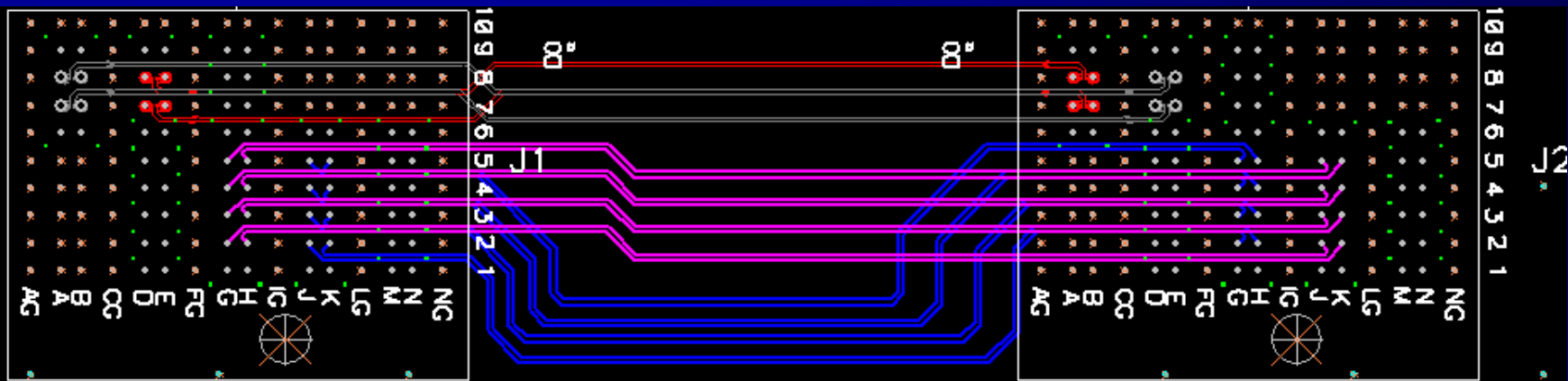
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Backplane Construction

1.25 mil Copper

0.6 mil Copper

10.2 mil TYP Core

8 mil TYP Prepreg

7.2 mil TYP trace
6.8 mil space

Channel Pitch Progression = 1.85 mm TYP

Core Dk = 3.57
Core Dissipation Factor = 0.013

Prepreg Dk = 3.43
Prepreg Dissipation Factor = 0.013

Channel Lengths = 44.21", 34.37", 25.00", 20.00", 15.00", 10.00", 3.00"

Channel Routing Example

TRANSMIT – LAYER 3 – SIGNAL 1 – BACK DRILL
RECEIVE – LAYER 18 – SIGNAL 8

- **Shows 8 inch channel to save space**
- **1 m channel is similar**
- **Channel nomenclature from connector pin locations**
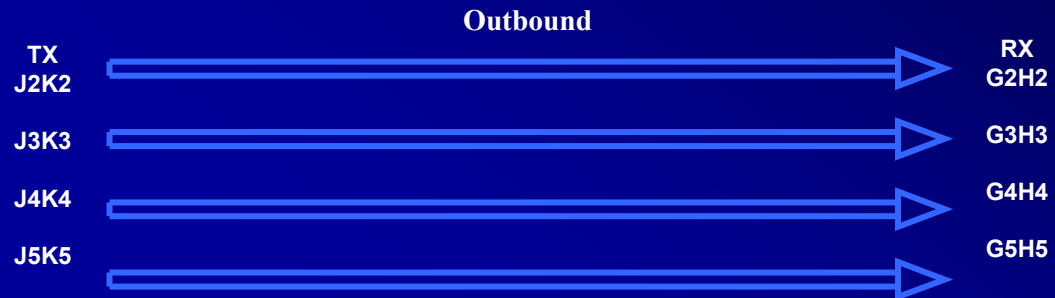
Channel Nomenclature

- **Aids interpretation of posted data**

- **Description to be posted to Channel Model Library**

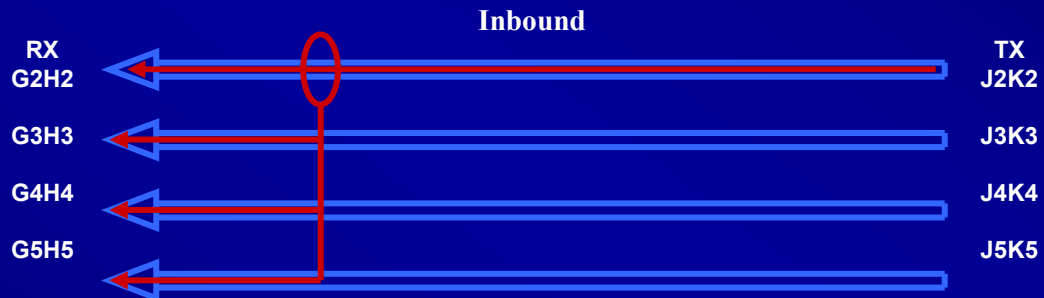- **All FR408 channels discussed here are backdrilled or bottom-routed**

GbX^{TM} Terminal Positions Designated By Flags For Each Backplane Connector

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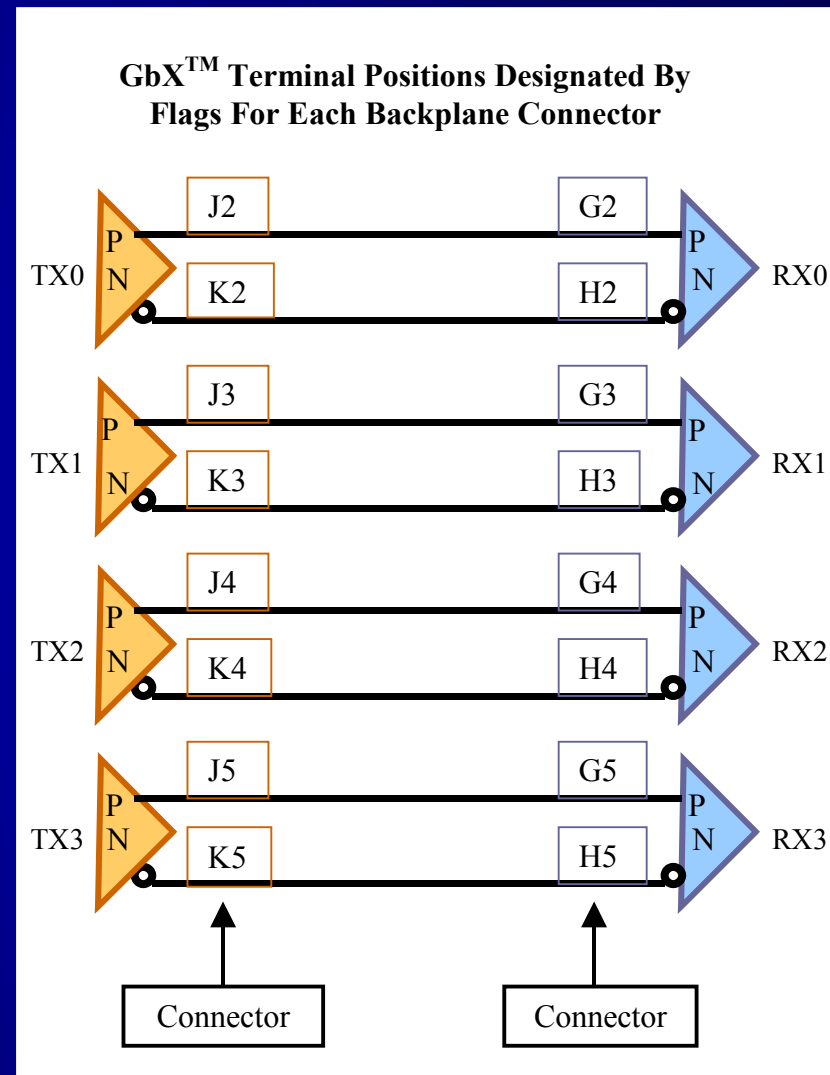
NEXT and FEXT Measurements

Inbound FEXT Example

Layer 3 (top) backdrilled

Layer 18 (bottom)

Outbound

TX J2K2	→	RX G2H2
J3K3	→	G3H3
J4K4	→	G4H4
J5K5	→	G5H5

Inbound

RX G2H2	←	TX J2K2
G3H3	←	J3K3
G4H4	←	J4K4
G5H5	←	J5K5

Inbound Thru Channel → sj2k2g2h2

• Associated FEXT Channels → Located in Inbound FEXT Channel Folder
   • sj2k2g3h3
   • sj2k2g4h4
   • sj2k2g5h5
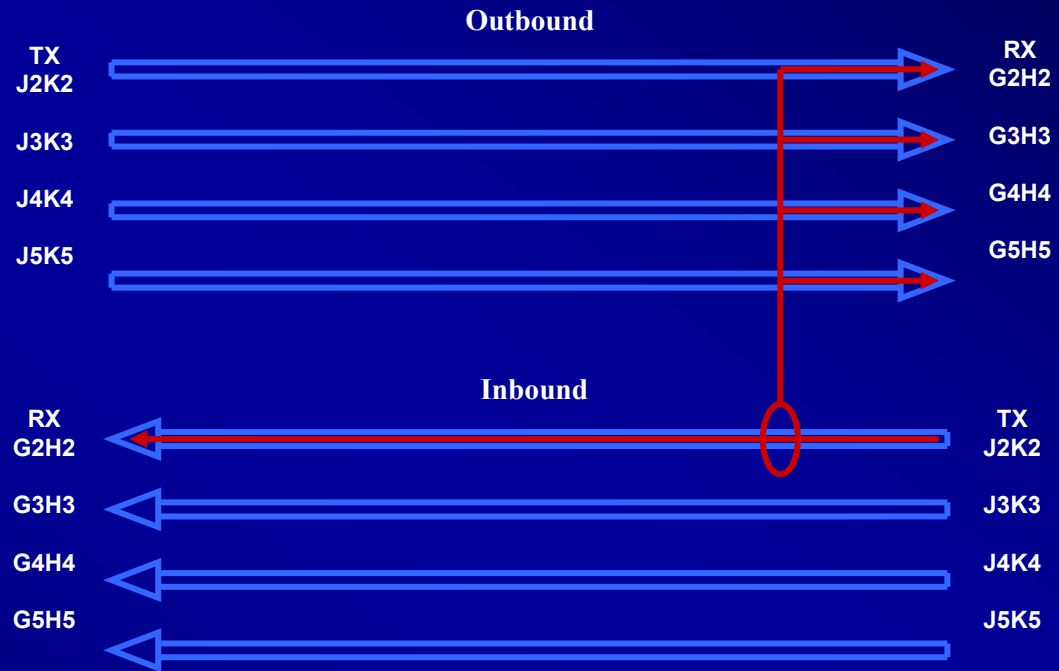
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NEXT and FEXT Measurements

Inbound NEXT Example

Layer 3 (top) backdrilled

Outbound

TX J2K2	→	RX G2H2
J3K3	→	G3H3
J4K4	→	G4H4
J5K5	→	G5H5

Layer 18 (bottom) backdrilled

Inbound

RX G2H2	←	TX J2K2
G3H3	←	J3K3
G4H4	←	J4K4
G5H5	←	J5K5

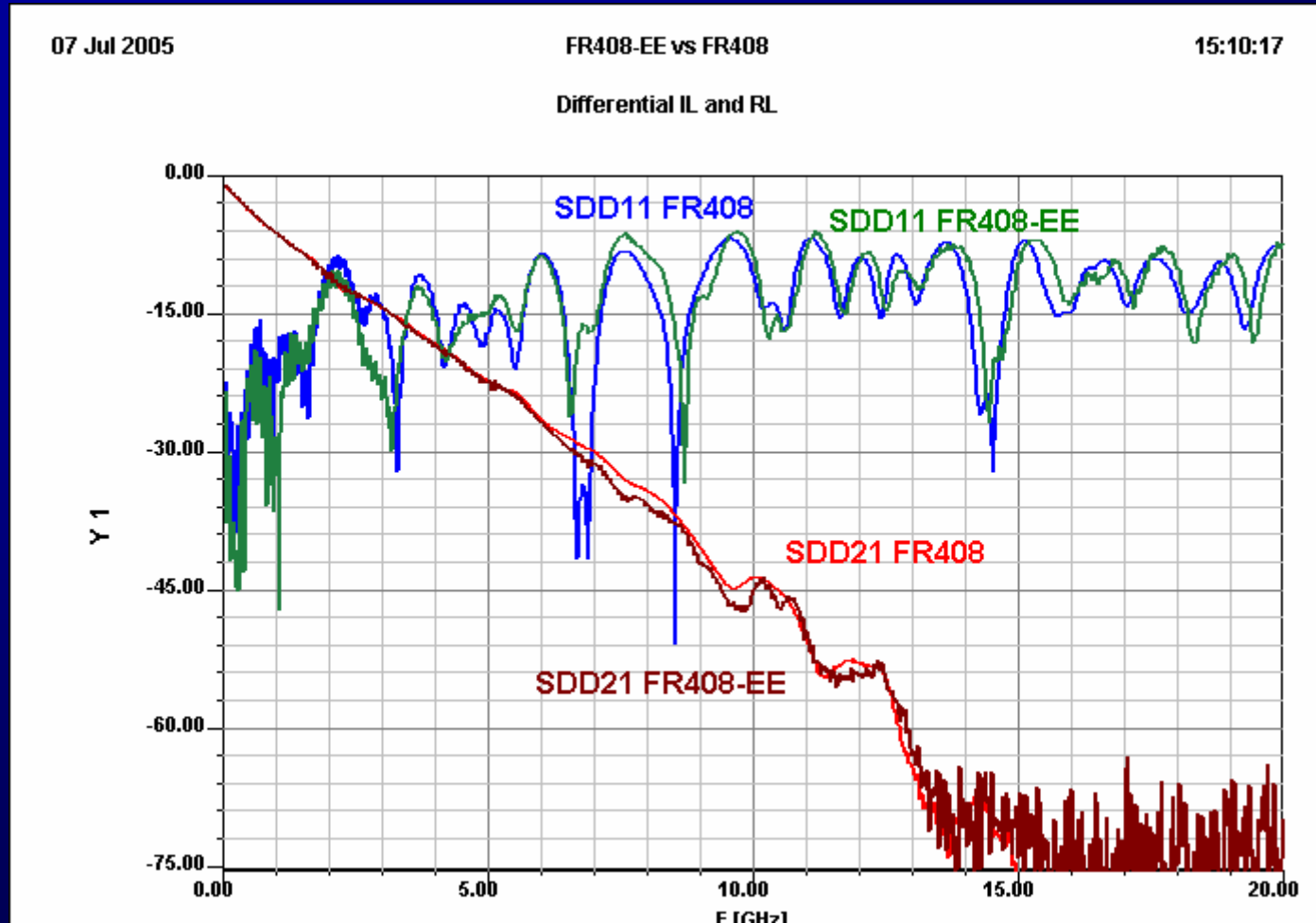Inbound Thru Channel → sj2k2g2h2

• Associated NEXT Channels → Located in Inbound NEXT Channel Folder
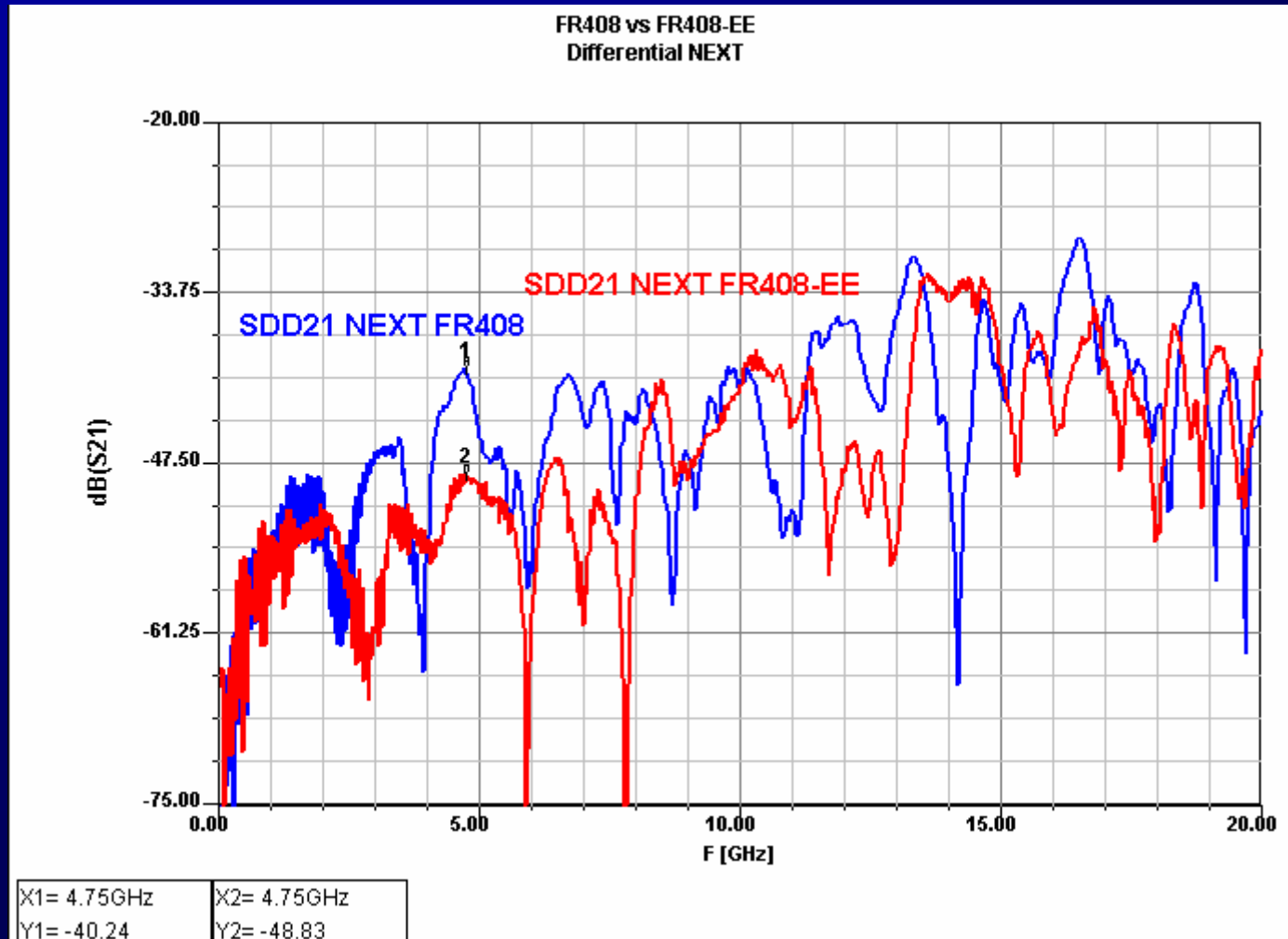   • sj2k2g2h2
    • sj2k2g3h3
    • sj2k2g4h4
    • sj2k2g5h5

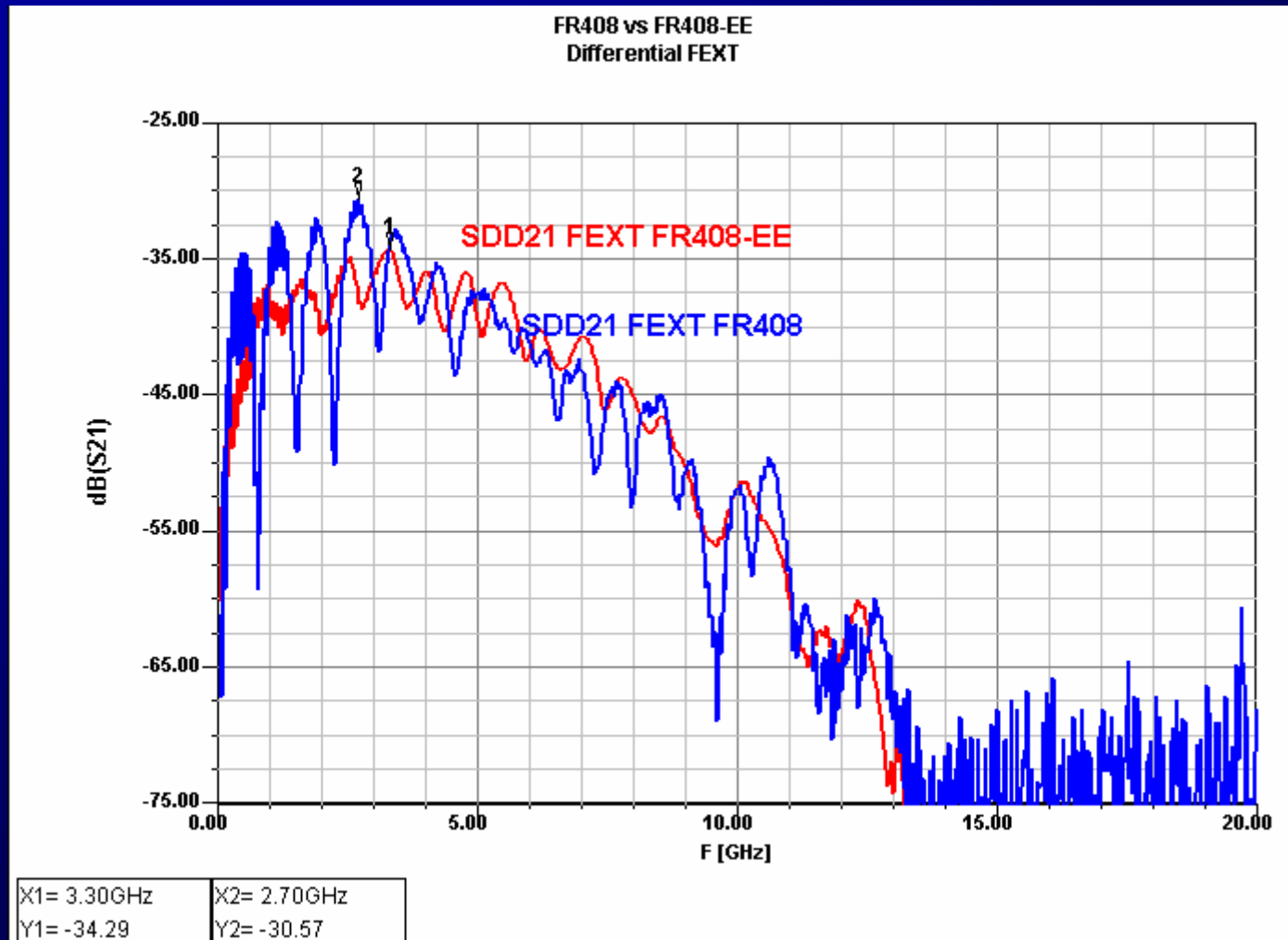July 13 2005

Test Results and Comparison: SDD21 Outbound

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Test Results and Comparison: SDD21 NEXT

FR408 vs FR408-EE
Differential NEXT

Test Results and Comparison: SDD21 FEXT

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Summary

- **Isola FR408 backplane 1 m channels**
    - Electrically enhanced performance
- **S-parameter measurements up to 20 GHz**

- **Compared with FR408 backplane standard 1 m channels:**
    - NEXT improvement by ~ 8 dB
    - FEXT improvement by ~ 3.7 dB
- **Please use in simulations to study performance, ICR effects, etc**

Thank You