



# Channel Simulations for 112G Backplane Analysis

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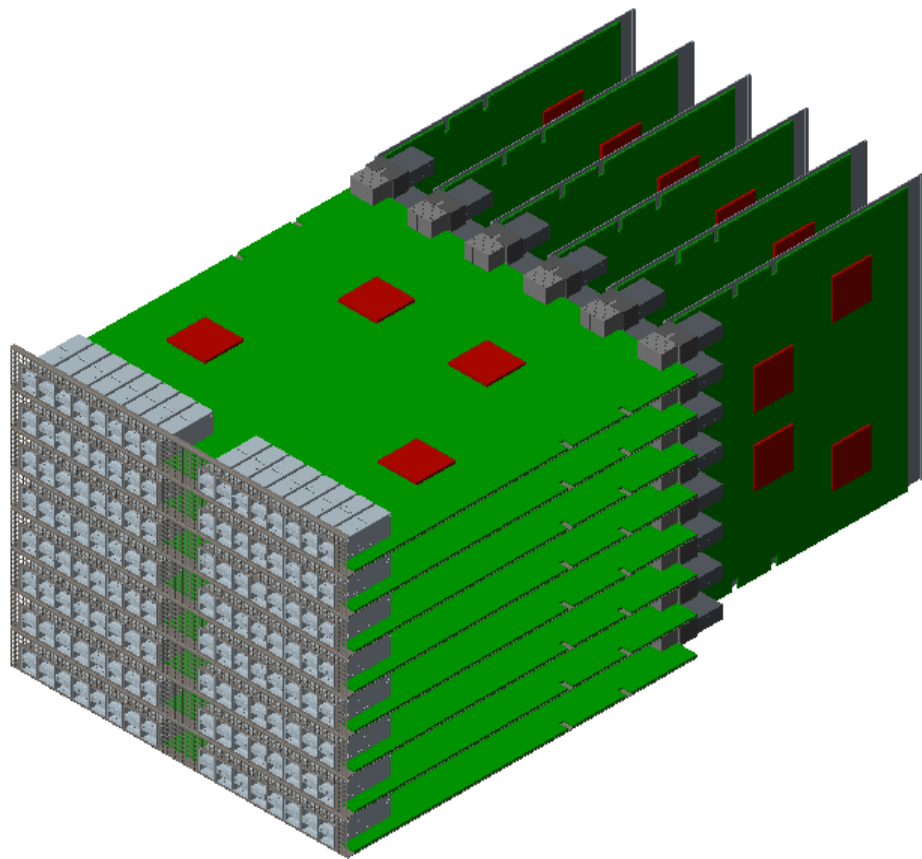
EVERY CONNECTION COUNTS



# Objective

- To support 112G backplane channel analysis, the following two backplane channel configurations are being provided:
  1. Orthogonal Channel with 4/10/12/14 inch traces on both Line Cards with Megtron-7N material (S-Parameter files: tracy\_3ck\_02\_0119.zip)
  2. Traditional Backplane Channel w/ 2/4 inch traces per Line Card with Megtron-7N material and 8/16 inch traces per Backplane with Megtron-7N material (S-Parameter files: tracy\_3ck\_03\_0119.zip)
- All Channels include Next-Gen STRADA Whisper\* backplane connectors

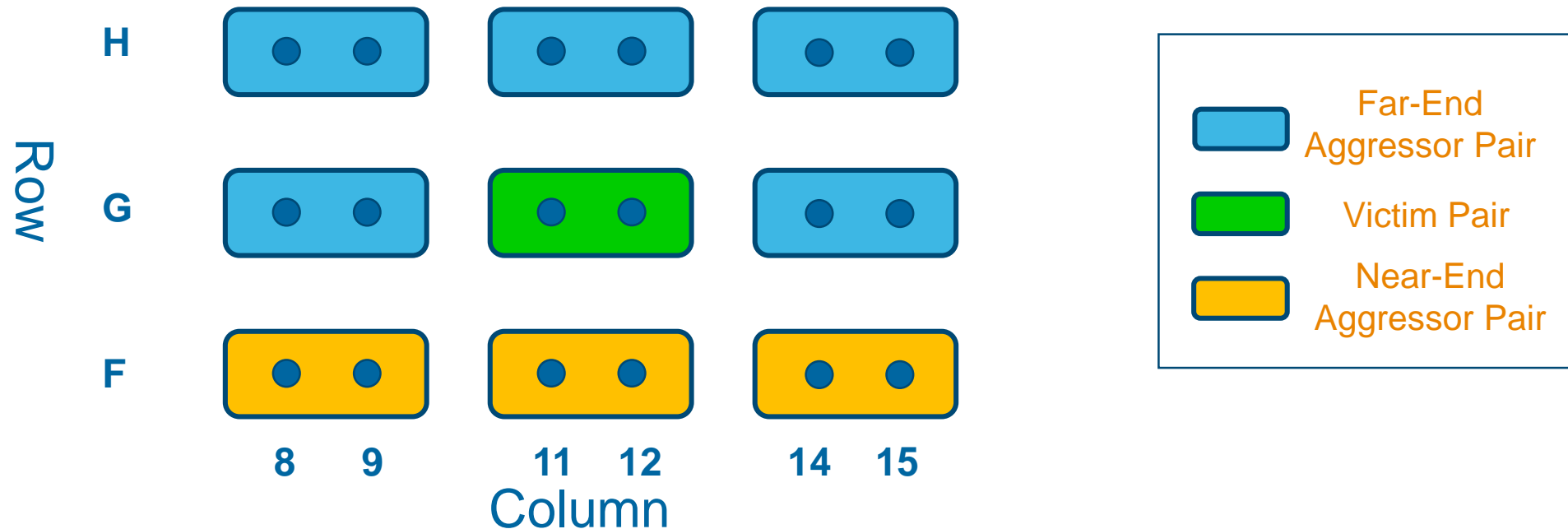
# Orthogonal Backplane Channel



- 8/20/24/28" PCB Trace Total
  - 4/10/12/14" Trace per board
  - 6/6/6 trace geometry
  - Meg7N Laminates
  - HVLP Foils
- 140mil (3.56mm) Thick PCBs
  - Victim pair uses layer 2 routing
  - Victim pair: 15mil Stub w/ Shallow EON Technology
  - Aggressor Pairs are thru board to bottom layer
- Next-Gen STRADA Whisper Connector Model
  - Direct-Plug Orthogonal
  - Stub resonance has been addressed
  - Additional noise control features
- S-Parameter files: [tracy\\_3ck\\_02\\_0119.zip](#)

# Orthogonal Backplane Channel Crosstalk

Pin Configuration and File Format



- The S-Parameter package includes separate .s4p files for THRU pair and crosstalk pairs
- Pair G11/12 is the central victim pair. Crosstalk files aggress upon this pair
- Near-End and Far-End Crosstalk available in a typical TX/RX Pattern
- 0-60GHz in 10MHz steps
- S-Parameter files: tracy\_3ck\_02\_0119.zip

# Orthogonal Backplane Channel Results

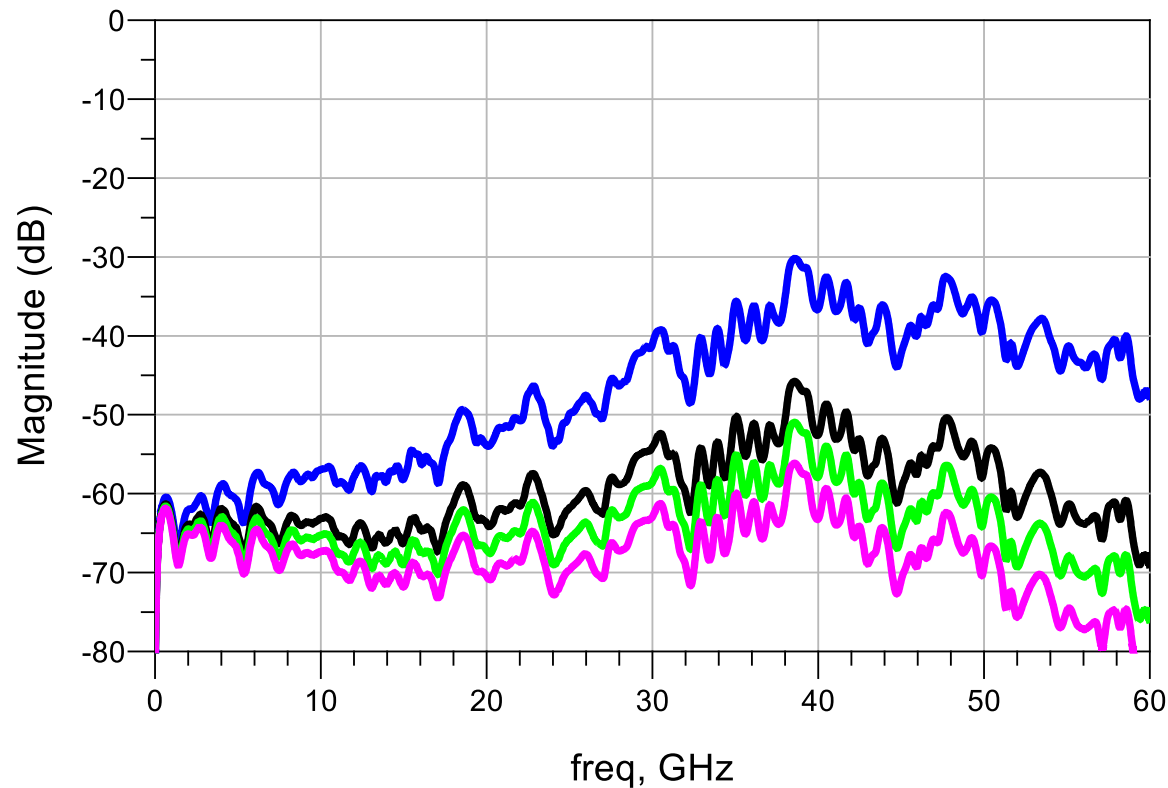
DPO - IL 12dB@26.56GHz - 4" Line Cards

DPO - IL 24dB@26.56GHz - 10" Line Cards

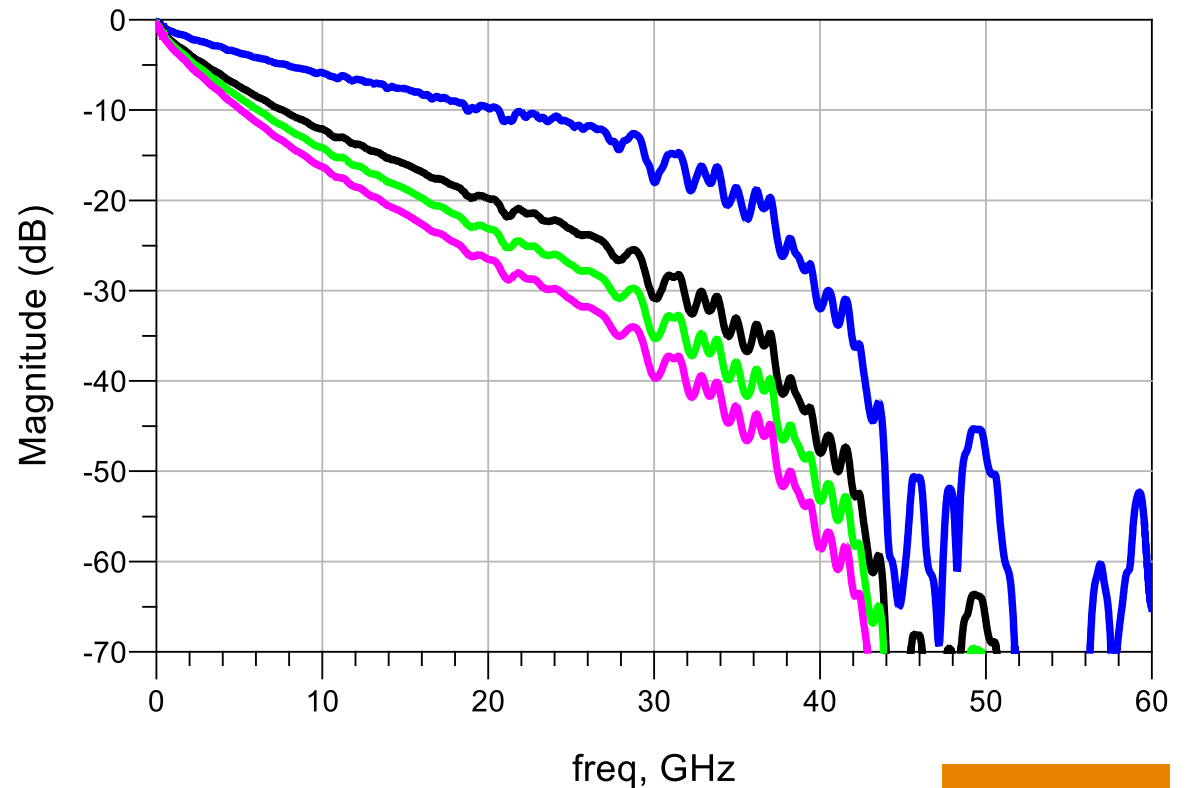
DPO - IL 28dB@26.56GHz - 12" Line Cards

DPO - IL 32dB@26.56GHz - 14" Line Cards

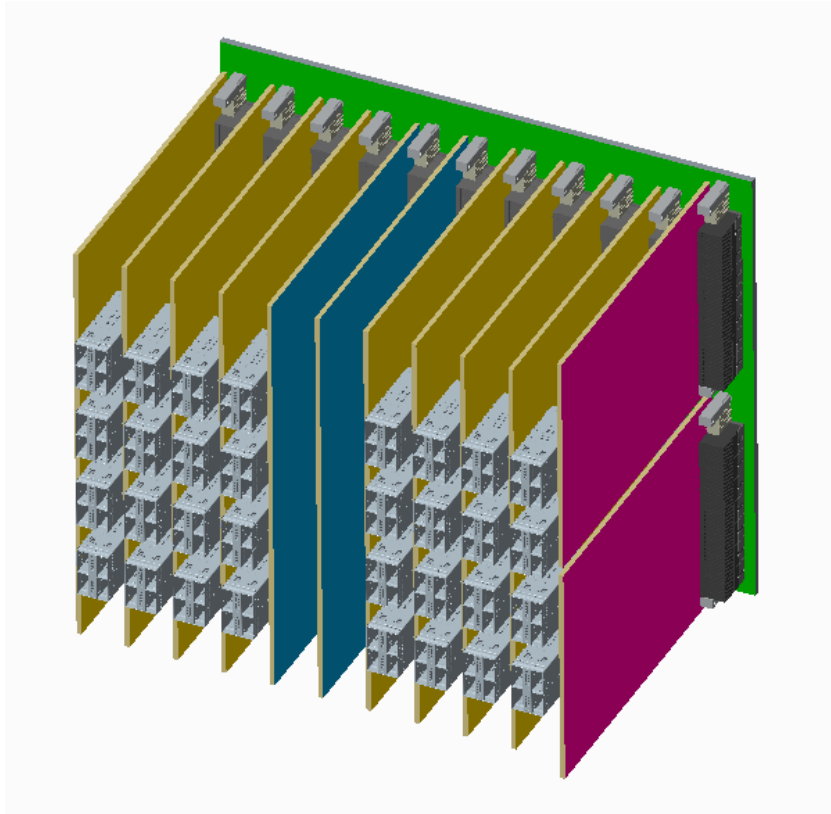
## TX/RX 8-Aggressor PowerSum Crosstalk



## Differential Insertion Loss



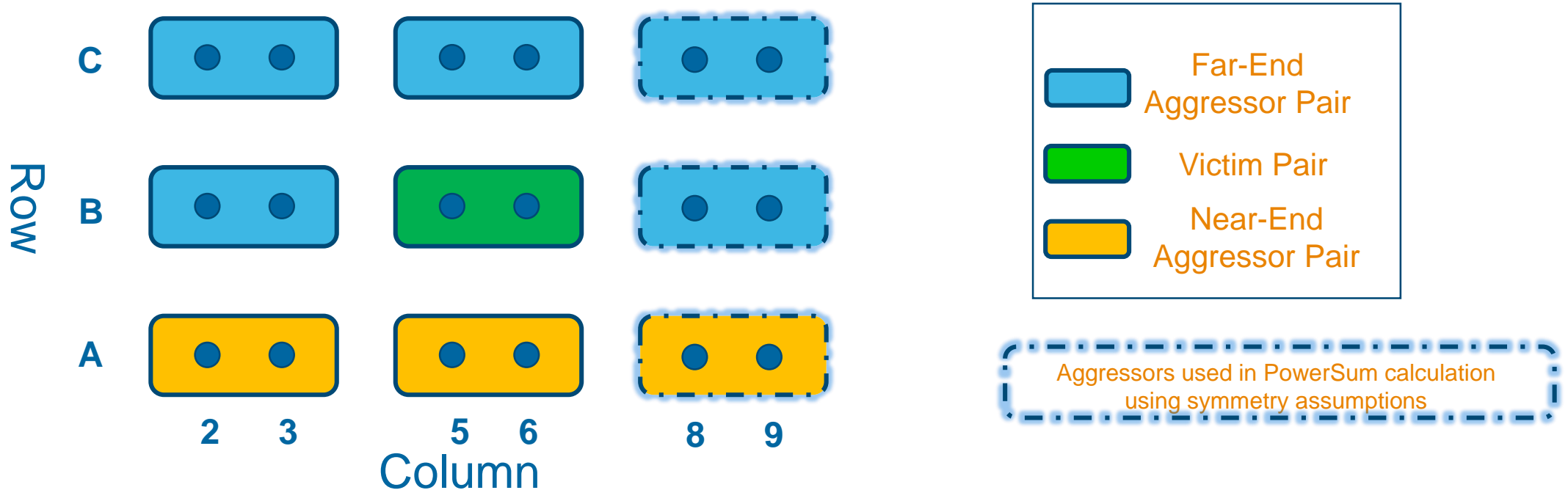
# Traditional Backplane Channel



- 12"/24" PCB Trace Total
  - 2"/4" Daughtercard Trace per Board
  - 8"/16" Backplane Trace
  - 6/6/6 Geometry
  - Meg7N Laminates
  - HVLP Foils
- 230mil (5.86mm) Backplane Footprint
- 133mil (3.38mm) Daughtercard Footprint
- Next-Gen STRADA Whisper Connector Model
  - Additional noise control features
  - Stub resonance addressed
- S-Parameter files: [tracy\\_3ck\\_03\\_0119.zip](#)

# Traditional Backplane Channel Crosstalk

Pin Configuration and File Format



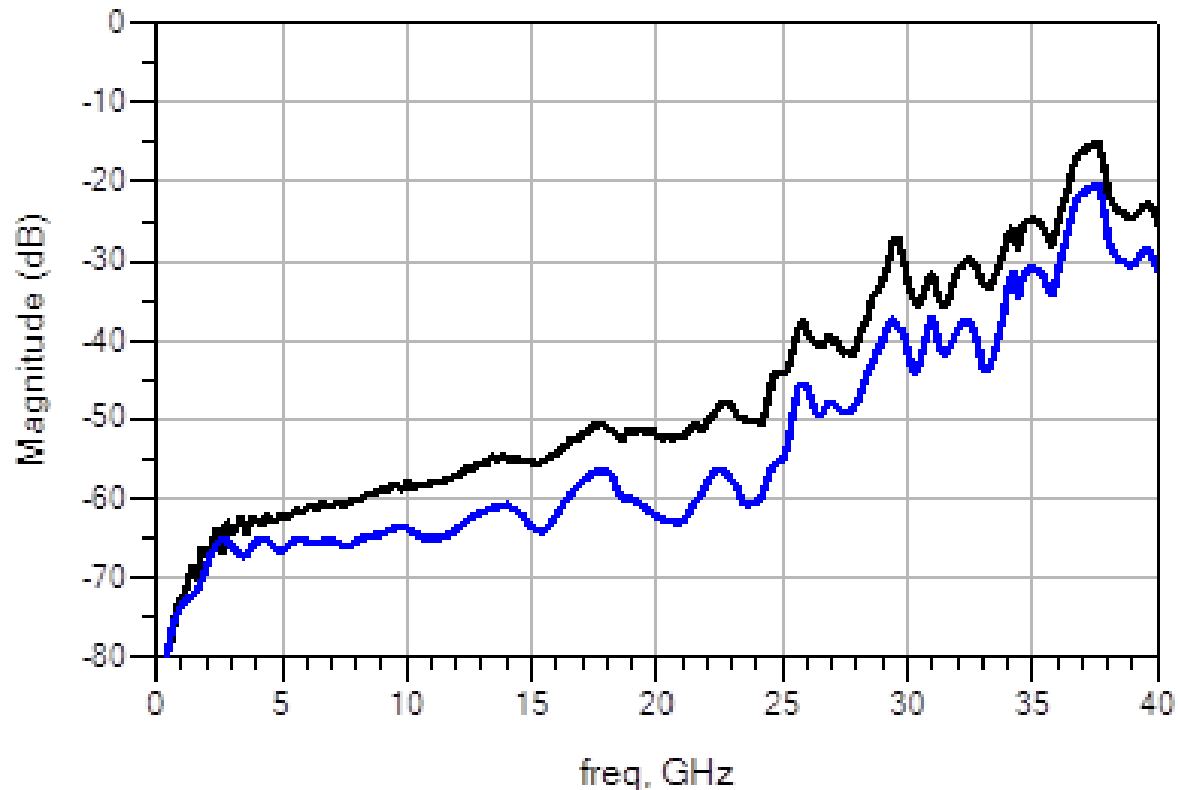
- The S-Parameter package includes separate .s4p files for THRU pair and crosstalk pairs
- Pair B5/6 is the central victim pair. Crosstalk files aggress upon this pair
- Near-End and Far-End Crosstalk available in a typical TX/RX Pattern
- Test vehicle has 6 pairs, 3 more aggressors are added by symmetry
- 0-40GHz in 10MHz steps
- S-Parameter files: tracy\_3ck\_03\_0119.zip

# Traditional Backplane Channel Results

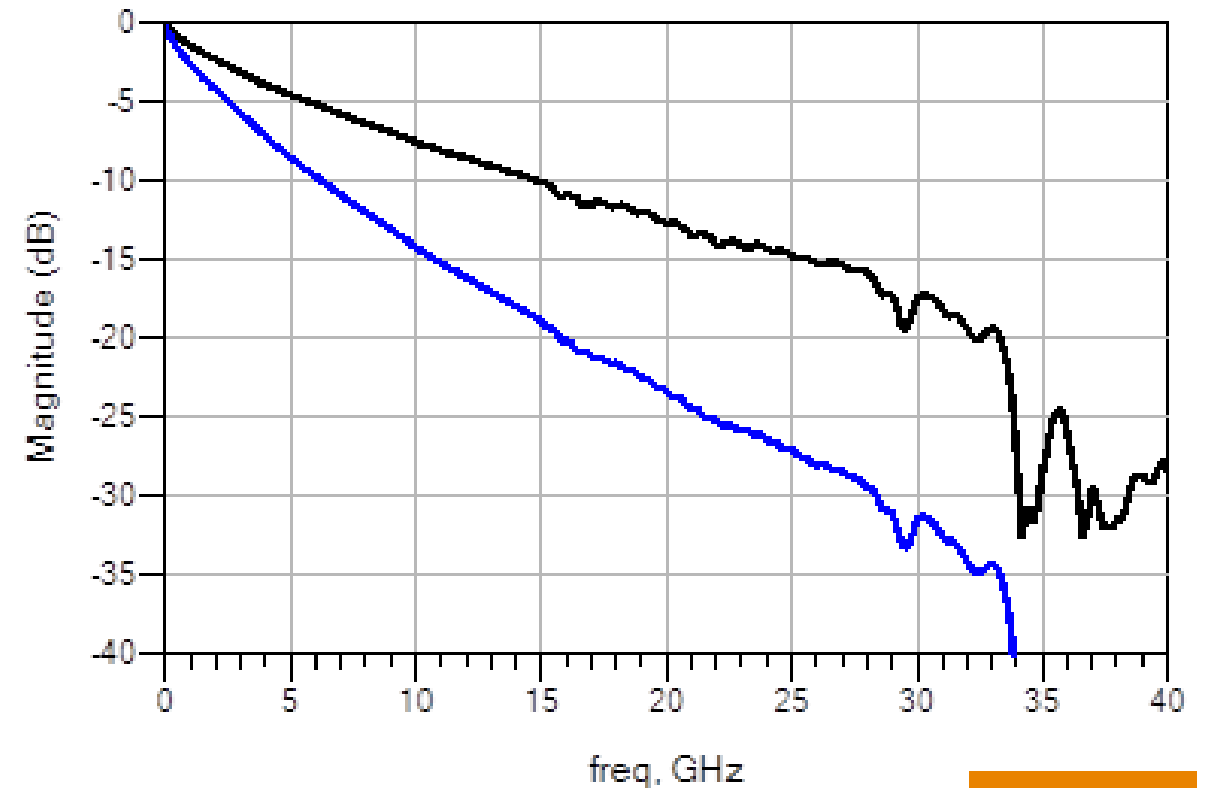
BP\_SYSTEM\_DC2" \_BP8"

BP\_SYSTEM\_DC4" \_BP16"

TX/RX 8-Aggressor PowerSum Crosstalk



Differential Insertion Loss





# Summary

- Six channel models have been contributed for study group analysis as 112Gbps backplane channels
  - Orthogonal backplane channel S-Parameter files: tracy\_3ck\_02\_0119.zip
  - Traditional backplane channel S-Parameter files: tracy\_3ck\_03\_0119.zip
- Connector/channel power sum noise suggest these are good candidates for 112Gbps backplane analysis
- Solutions provide high density and enable 112G backplanes reaches
- An improved backplane connector is included in the channels