

Customer Simulation Report:

Conan[®] Connector

7mm Stack Height

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- To provide customers with a Touchstone model of the Conan Connector with a flexible pin assignment
 - Modeled geometry is shown with port information
- Show wiring assignments for the 24 port Touchstone model
- Show electrical performance of the Touchstone file
 - Various electrical results are shown from the Touchstone file

- Simulation information
 - Conan Connector
 - 2 x 8 pin configuration (modeled with outer pins as grounds)
 - 7mm stack height
 - Pin pitch is 1.0mm
 - Reference planes 1mm of trace attached to SMT pad
 - Mated connectors
 - Footprint included
 - PCB's are part of the DUT
 - Port numbers – 24 ports are available

Results show

- Impedance – meets 100 ohms +/- 10% @ 50ps (10-90%)
- Insertion Loss
 - Very good up to ~ 6 GHz
 - Shorter stack heights will have resonances at higher frequencies
- Cross-talk – Relatively high for fast edge rates
 - Simple solution – space pairs apart or only on one side
 - Since NEXT is much greater than FEXT, customer may be able to group transceivers of same type next to one another

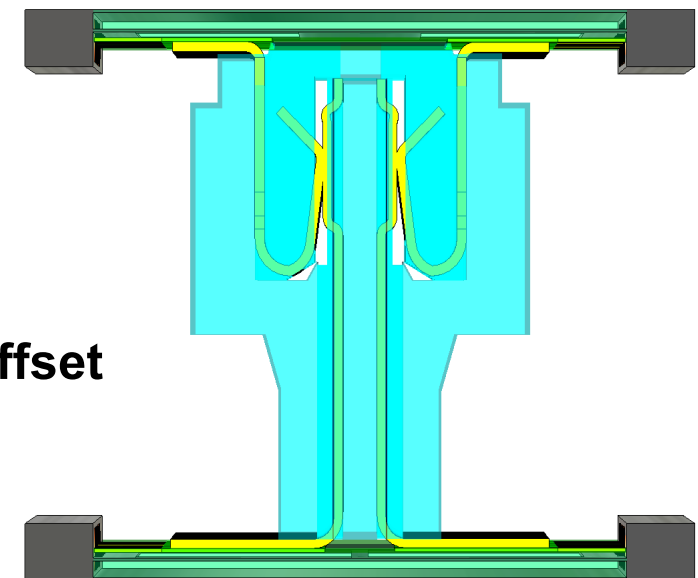
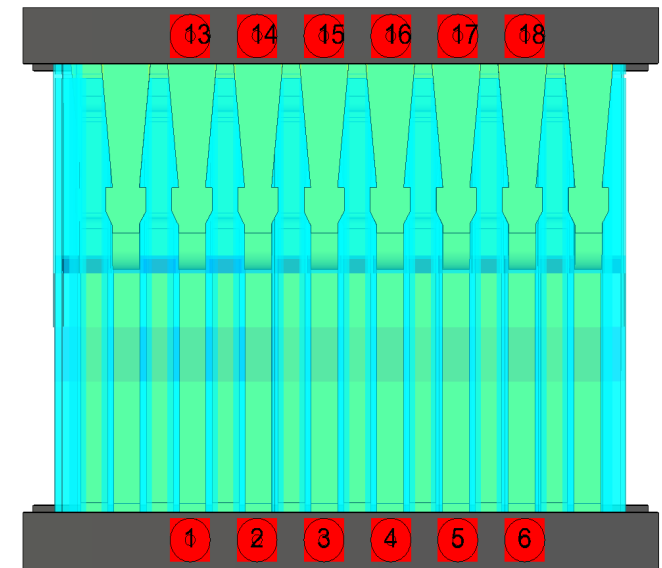
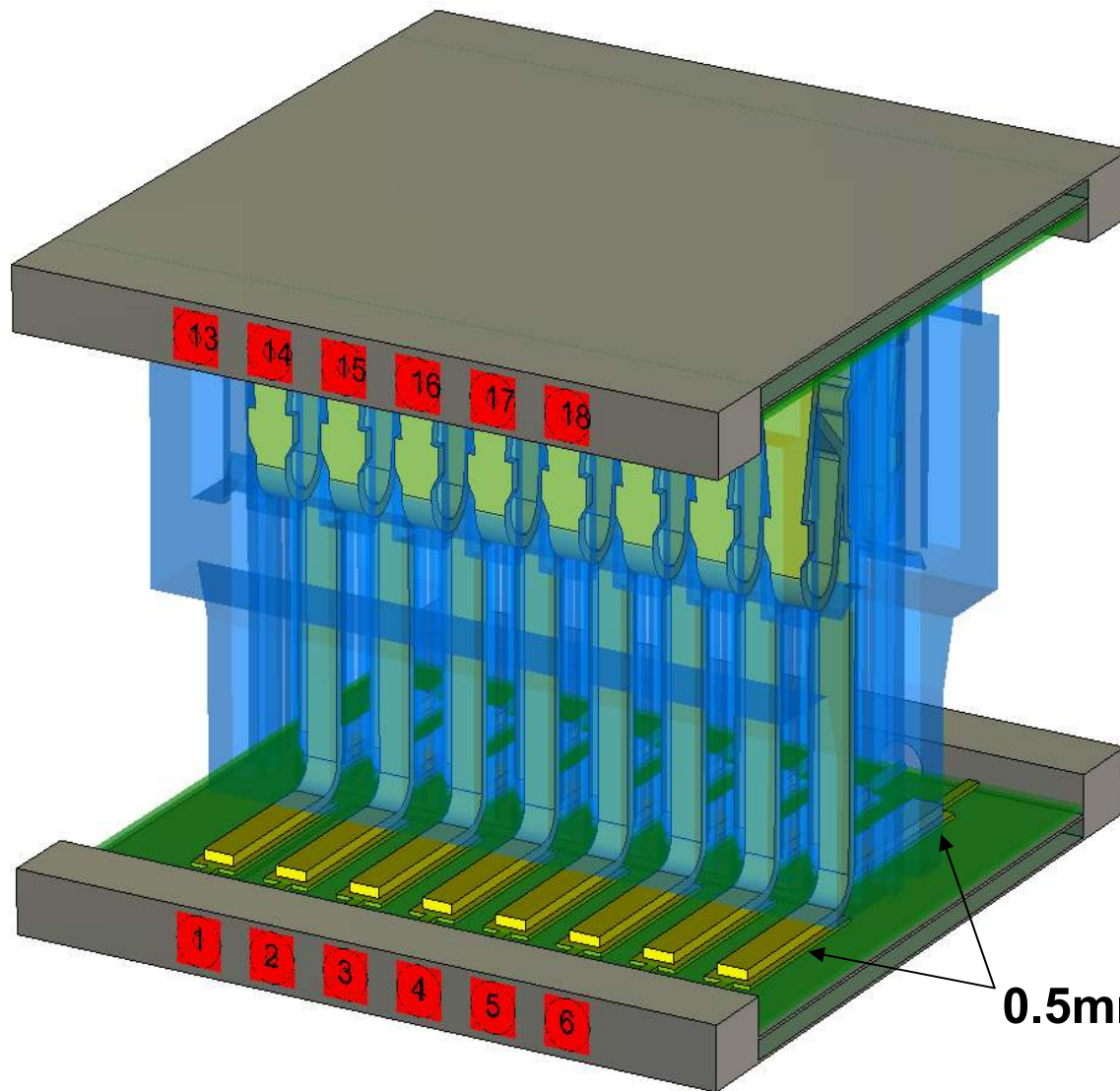
Overall impression

- The Conan 7mm should be capable of transmitting data at a rate up to 3 Gb/s

■ Simulation Details:

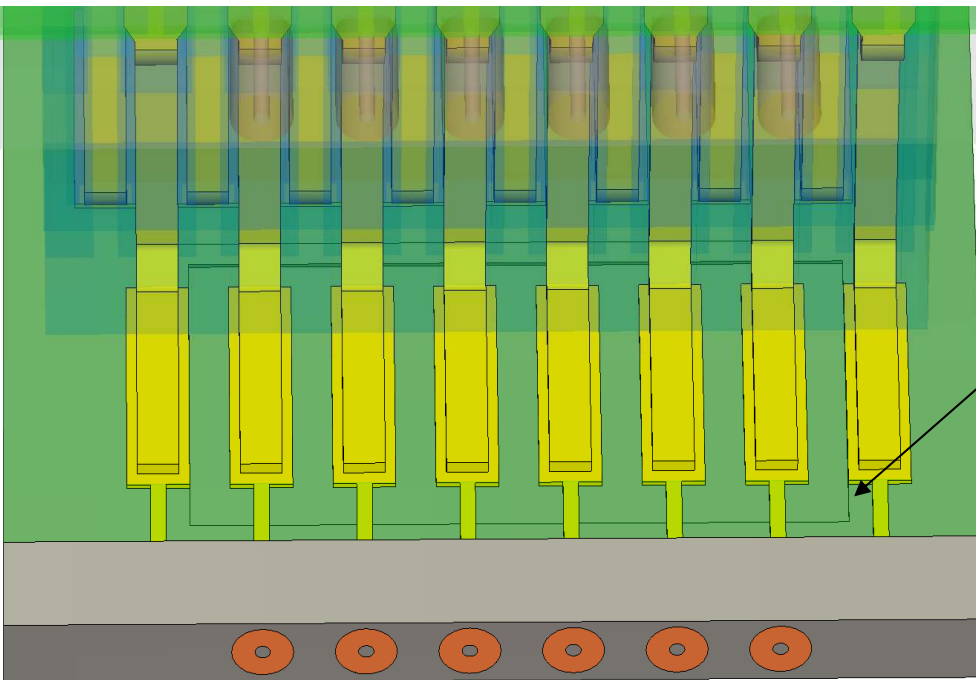
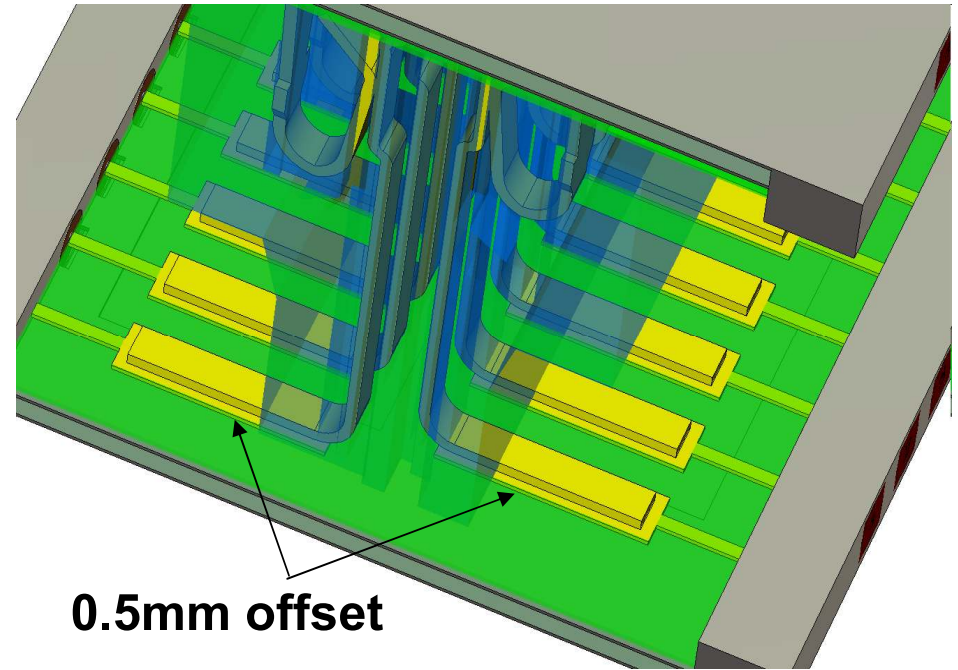
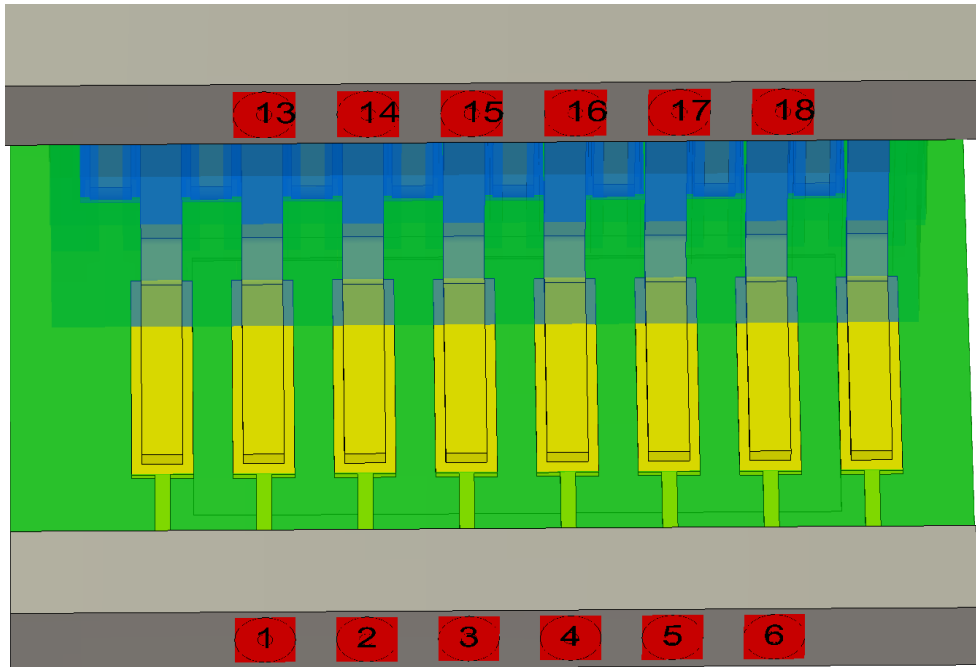
- 3-D simulation using CST MWS 2008.07 (0.0 to 20.05 GHz)
- CST project: CN_7mm_v4
- Touchstone file info: (See pictures for help)
 - Model file name: CN_7mm_v4_woren_401.s24p
 - Full 24 port file ~ 9 MB
 - (0.0 to 20.0 GHz @ 401 points, without renormalization)

Conan 7mm Connector



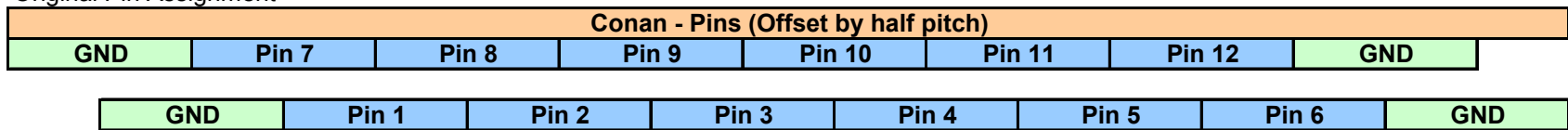
Additional pins were set to ground in post processing to determine wiring configurations. Crosstalk tables show new pin assignments.

Conan 7mm Connector

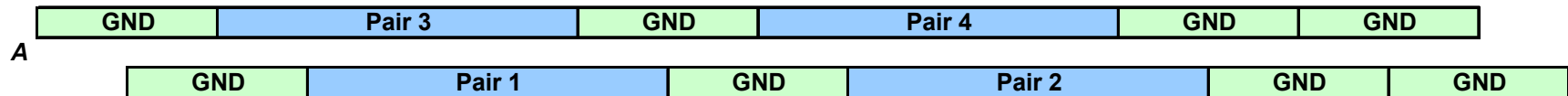


Void placed in next adjacent ground plane to improve impedance matching of signals on SMT pads.

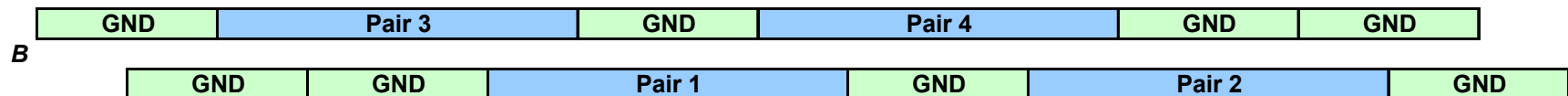
Original Pin Assignment



Configuration A

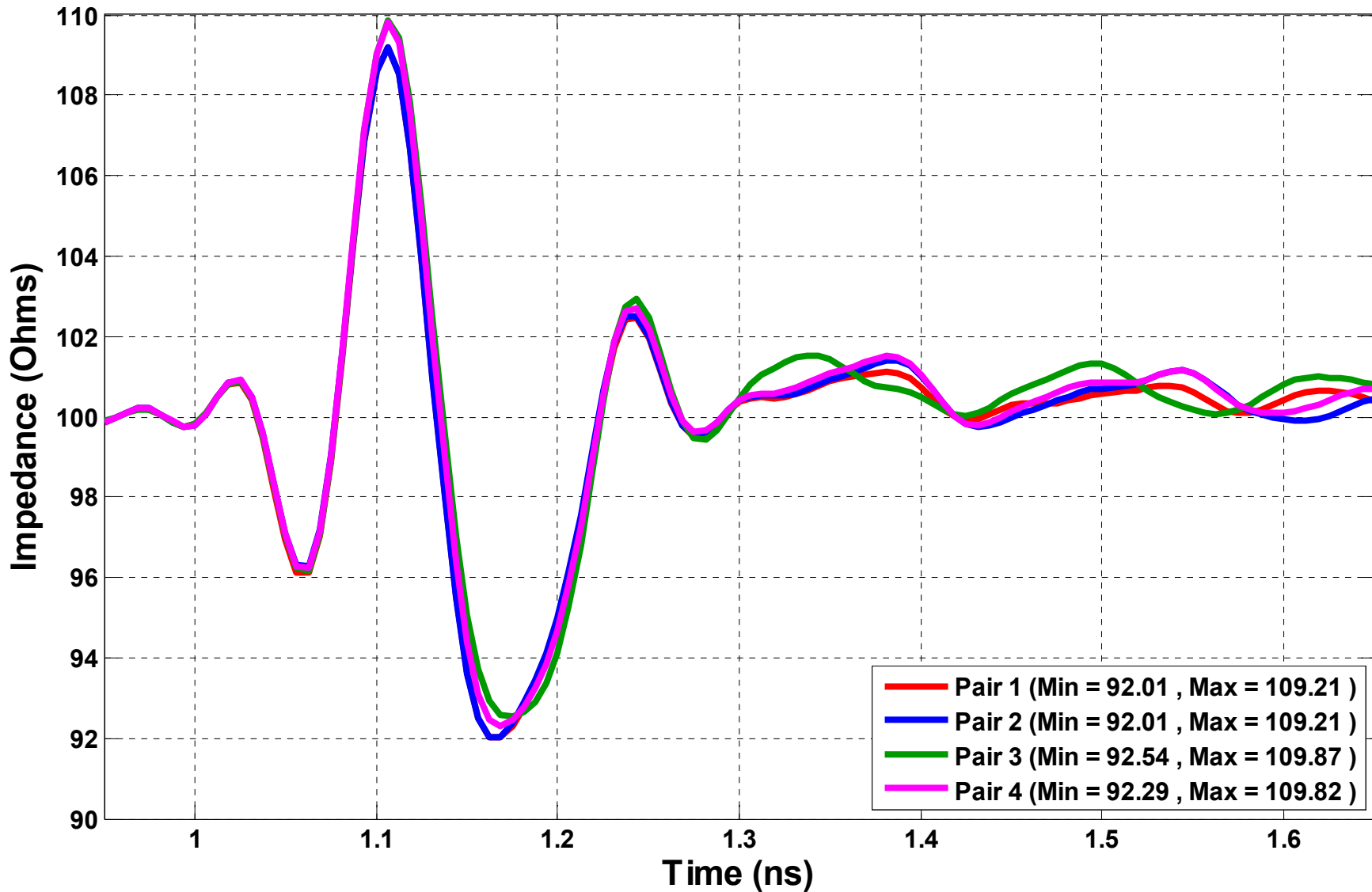


Configuration B



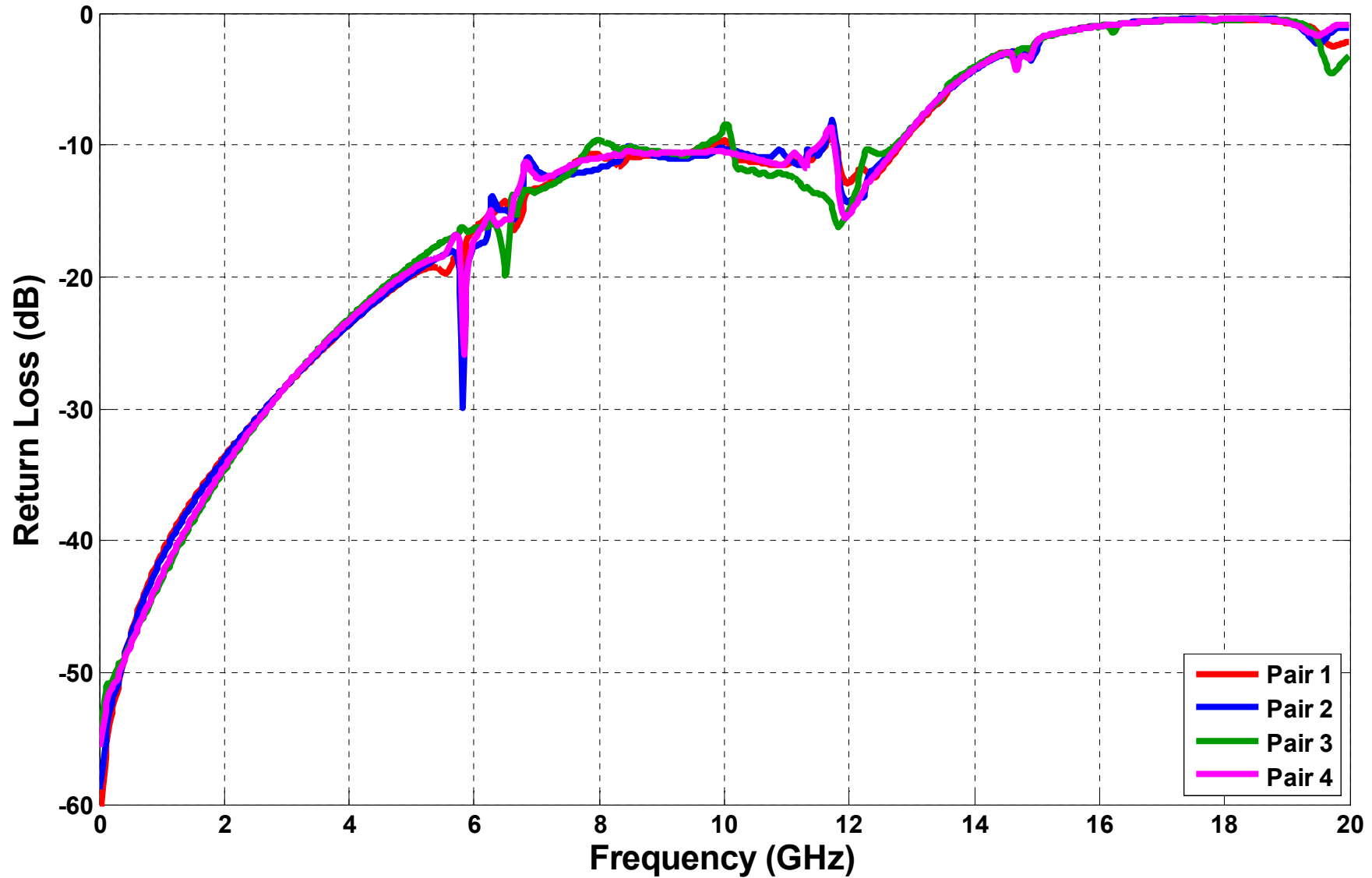
Configuration A

Conan 7mm A - DIFFERENTIAL IMPEDANCE - Risetime = 50 ps (10-90%)



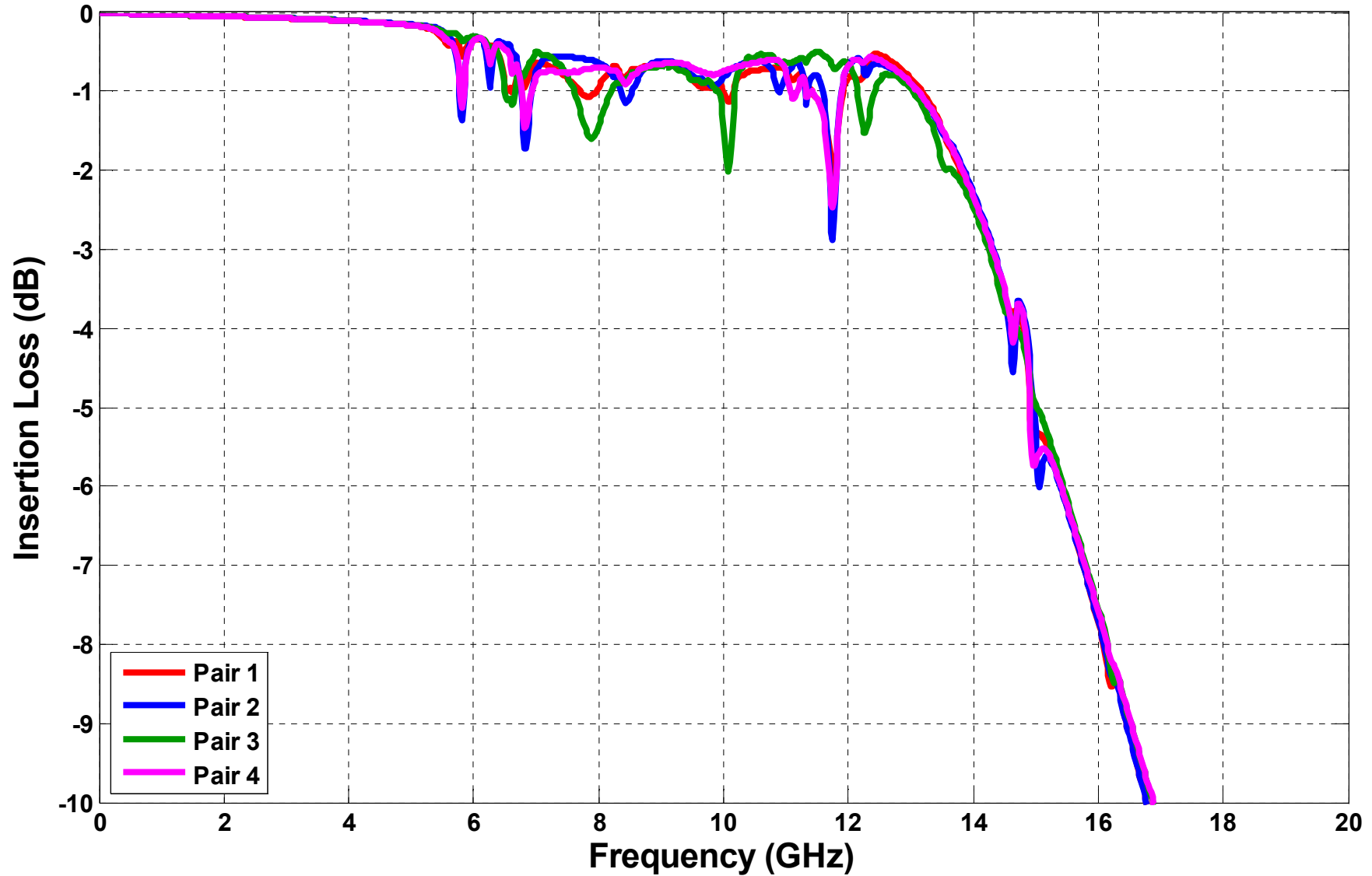
Configuration A

Conan 7mm A - DIFFERENTIAL RETURN LOSS



Configuration A

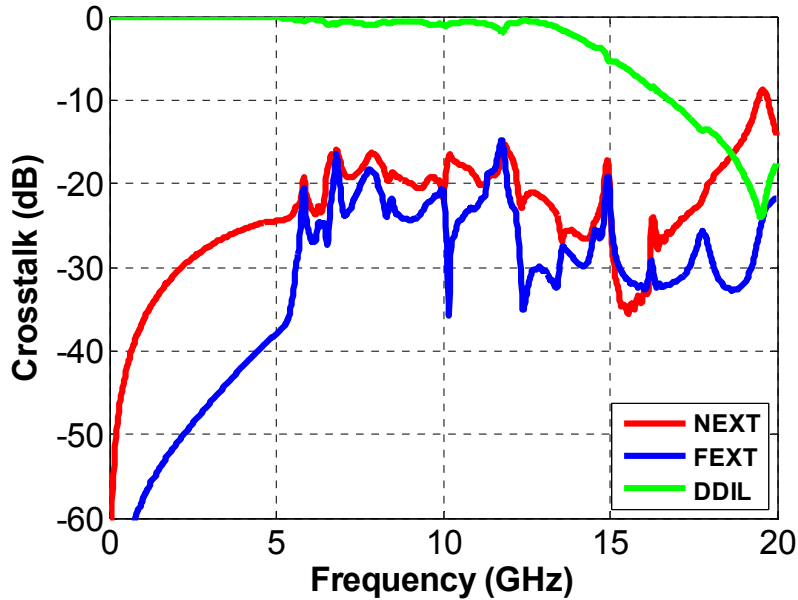
Conan 7mm A - DIFFERENTIAL INSERTION LOSS



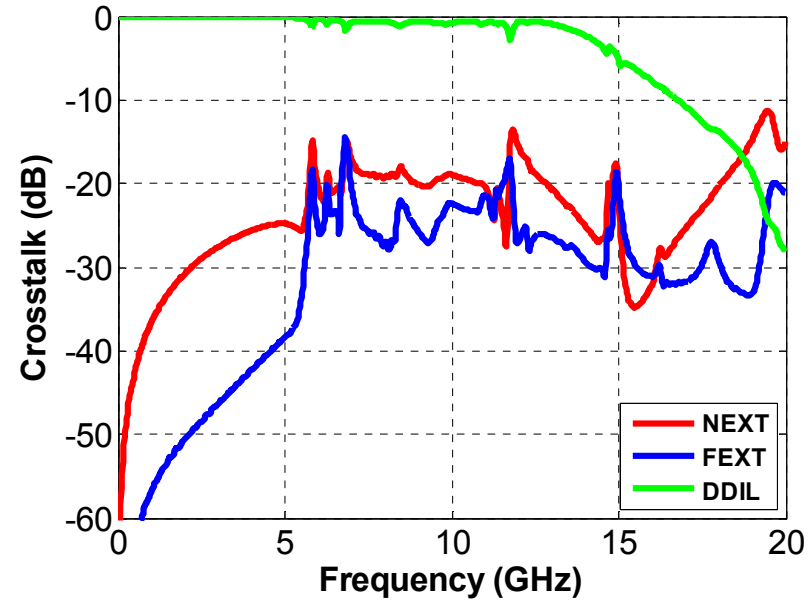
Power Sum Crosstalk – Configuration A



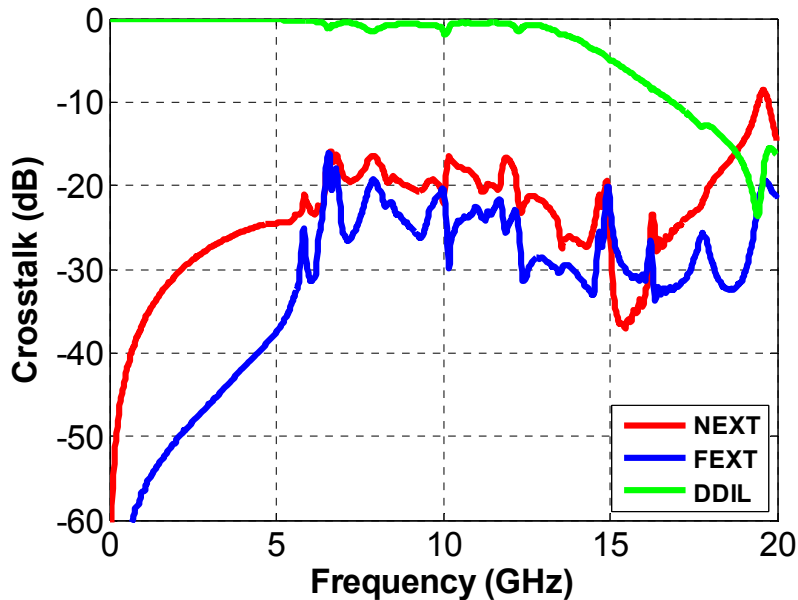
Pair 1 - POWER SUM X-TALK



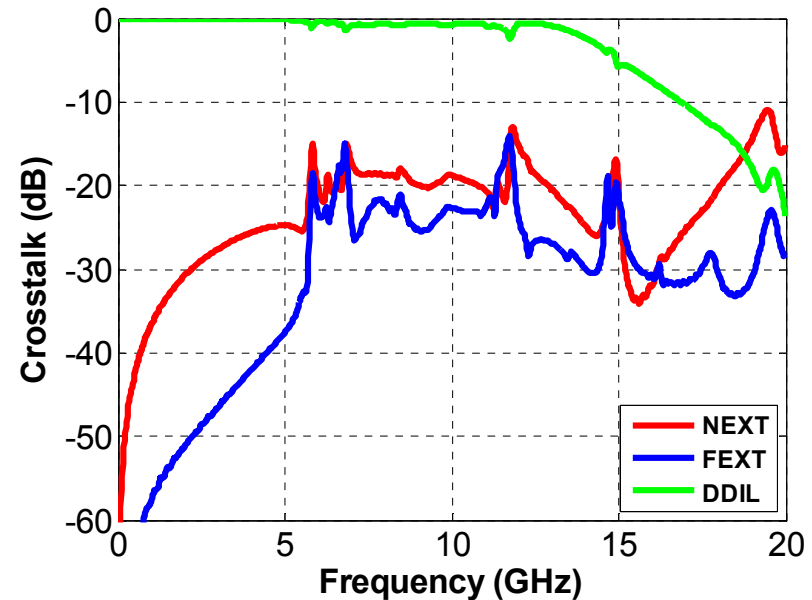
Pair 2 - POWER SUM X-TALK



Pair 3 - POWER SUM X-TALK



Pair 4 - POWER SUM X-TALK



Configuration A

Conan 7mm A NEXT[%] - Total NEXT : 4.56%		
From	To	Risetime = 50 ps (10-90%)
Pair 1	Pair 2	-0.41
Pair 1	Pair 3	3.81
Pair 1	Pair 4	-0.34

Conan 7mm A FEXT[%] - Total FEXT : 1.67%		
From	To	Risetime = 50 ps (10-90%)
Pair 1	Pair 6	0.45
Pair 1	Pair 7	0.78
Pair 1	Pair 8	-0.43

Conan 7mm A NEXT[%] - Total NEXT : 4.43%		
From	To	Risetime = 50 ps (10-90%)
Pair 2	Pair 1	-0.41
Pair 2	Pair 3	0.22
Pair 2	Pair 4	3.79

Conan 7mm A FEXT[%] - Total FEXT : 1.39%		
From	To	Risetime = 50 ps (10-90%)
Pair 2	Pair 5	0.45
Pair 2	Pair 7	0.20
Pair 2	Pair 8	0.74

Conan 7mm A NEXT[%] - Total NEXT : 4.45%		
From	To	Risetime = 50 ps (10-90%)
Pair 3	Pair 1	3.81
Pair 3	Pair 2	0.22
Pair 3	Pair 4	-0.42

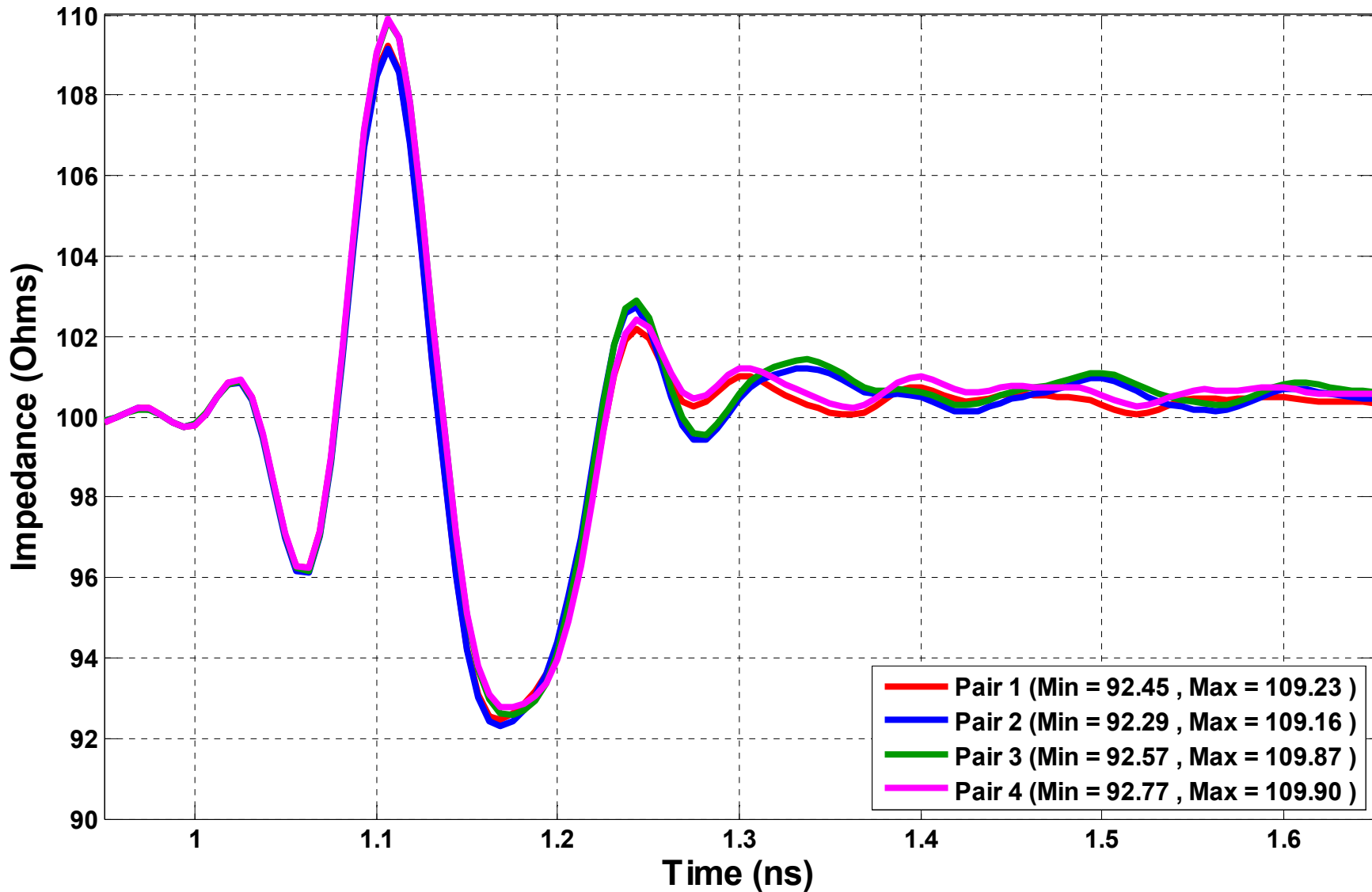
Conan 7mm A FEXT[%] - Total FEXT : 1.40%		
From	To	Risetime = 50 ps (10-90%)
Pair 3	Pair 5	0.71
Pair 3	Pair 6	-0.23
Pair 3	Pair 8	0.46

Conan 7mm A NEXT[%] - Total NEXT : 4.55%		
From	To	Risetime = 50 ps (10-90%)
Pair 4	Pair 1	-0.34
Pair 4	Pair 2	3.79
Pair 4	Pair 3	-0.42

Conan 7mm A FEXT[%] - Total FEXT : 1.63%		
From	To	Risetime = 50 ps (10-90%)
Pair 4	Pair 5	-0.44
Pair 4	Pair 6	0.74
Pair 4	Pair 7	0.46

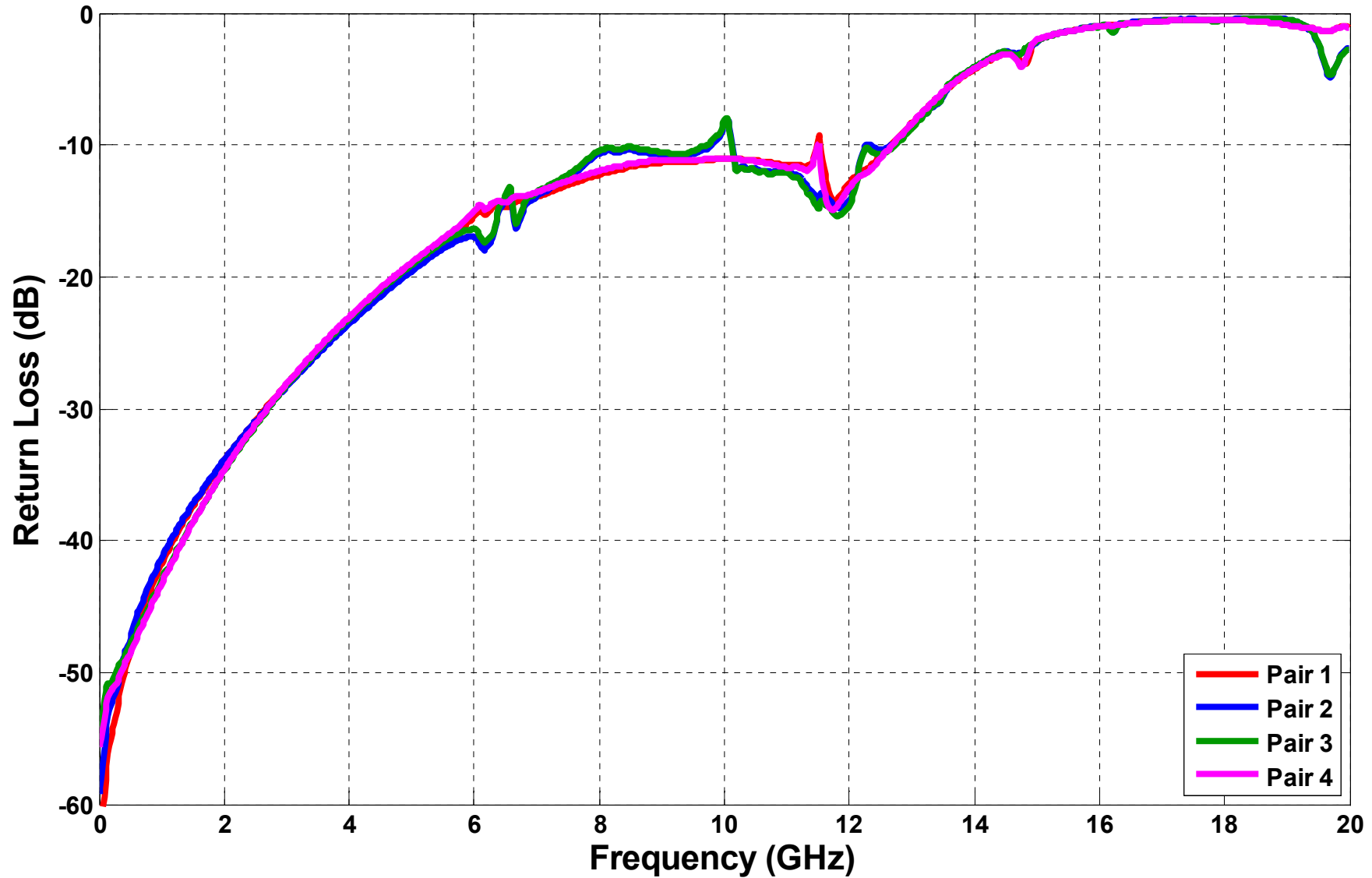
Configuration B

Conan 7mm B - DIFFERENTIAL IMPEDANCE - Risetime = 50 ps (10-90%)



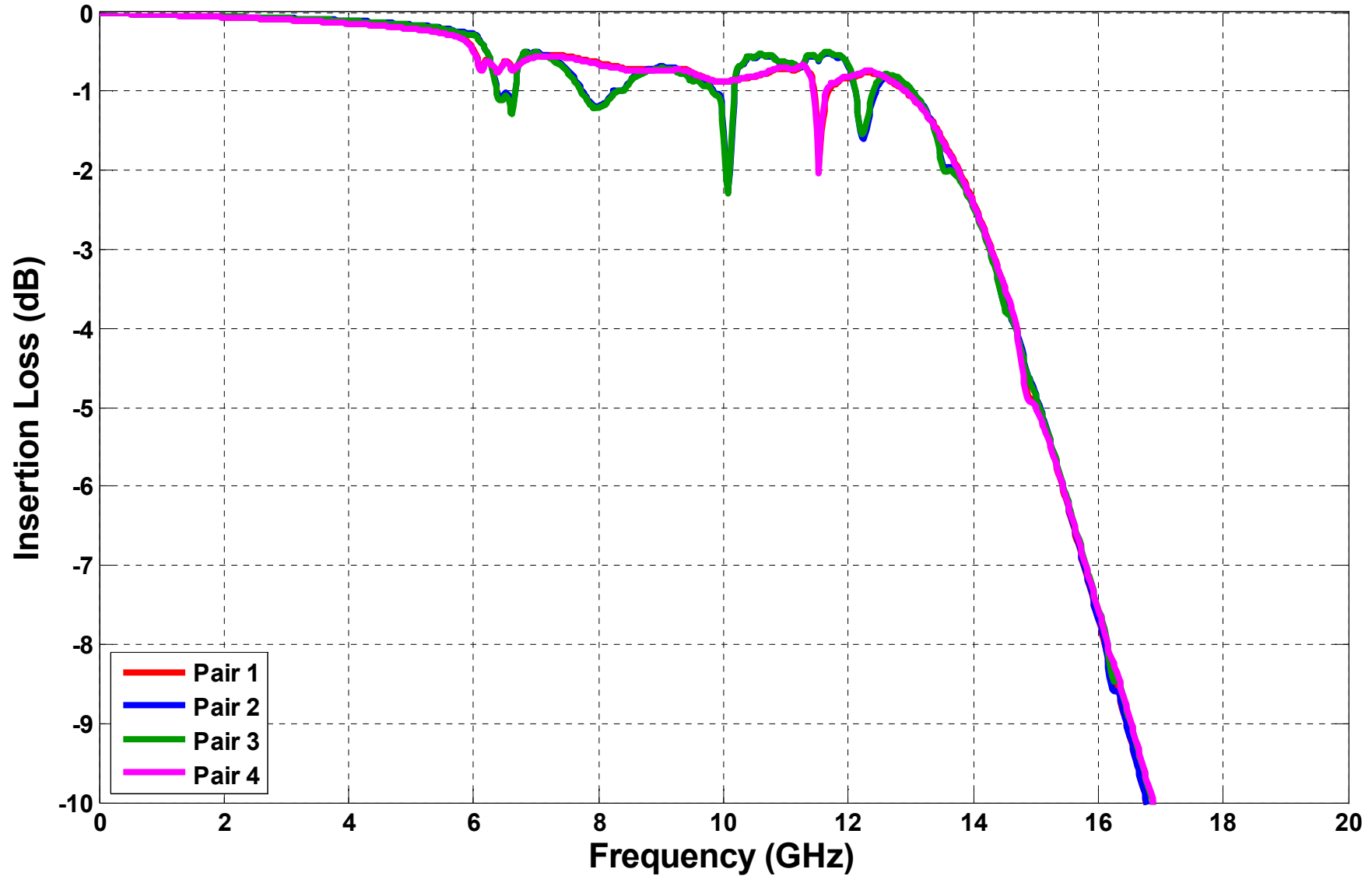
Configuration B

Conan 7mm B - DIFFERENTIAL RETURN LOSS



Configuration B

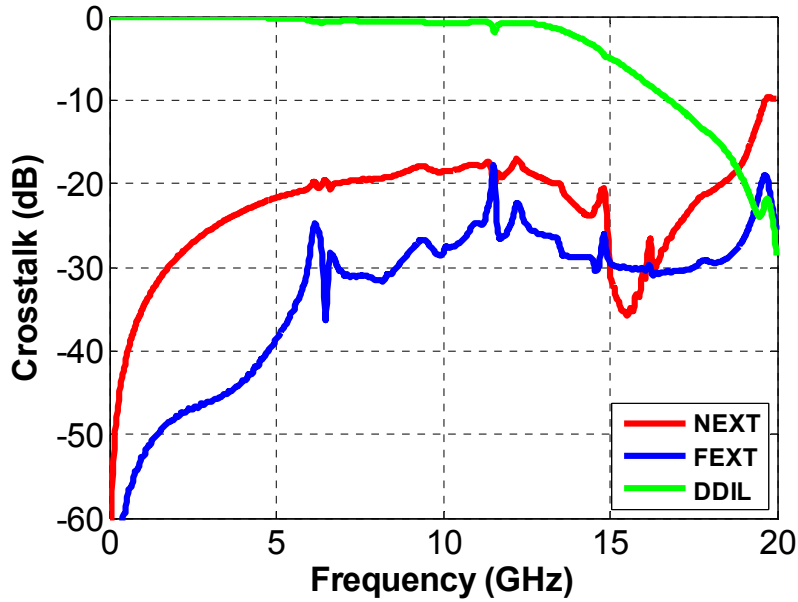
Conan 7mm B - DIFFERENTIAL INSERTION LOSS



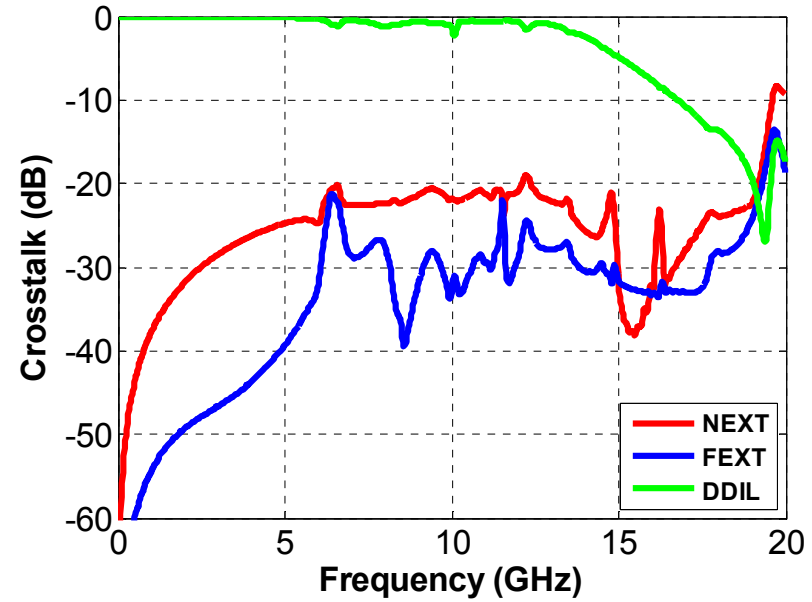
Power Sum Crosstalk – Configuration B



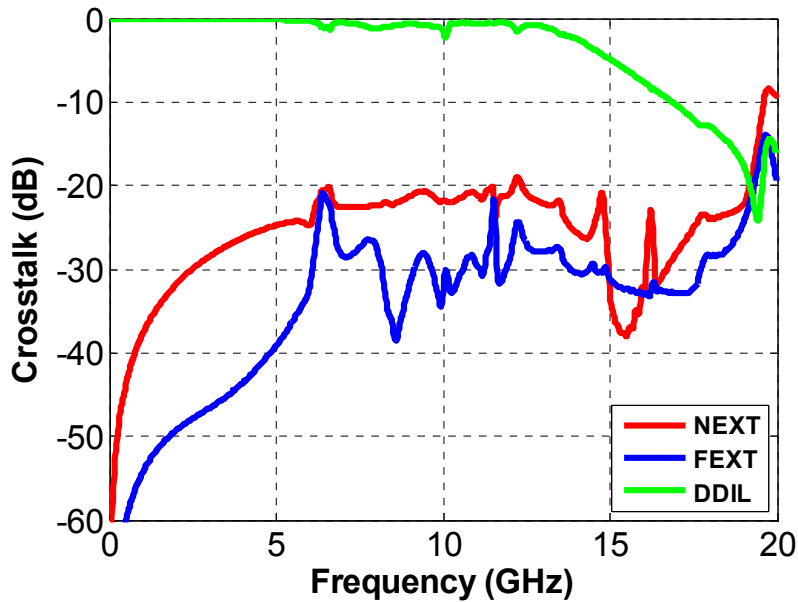
Pair 1 - POWER SUM X-TALK



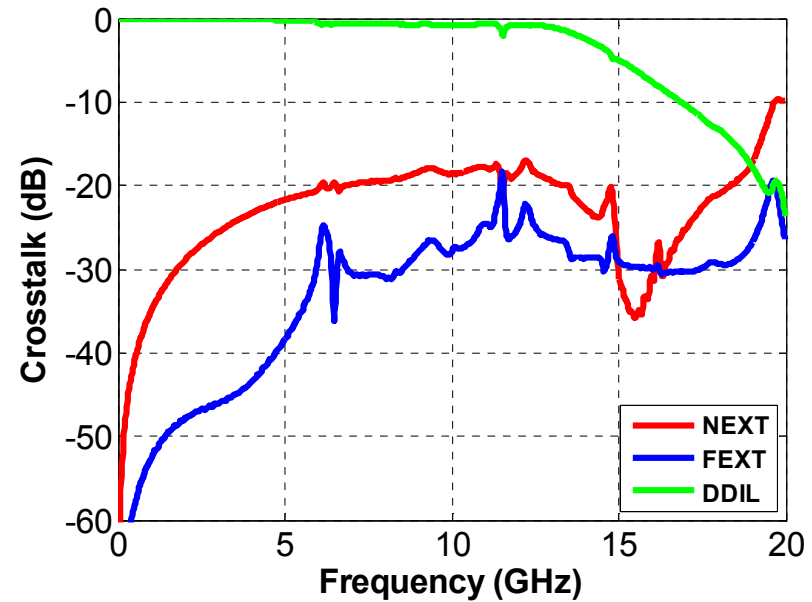
Pair 2 - POWER SUM X-TALK



Pair 3 - POWER SUM X-TALK



Pair 4 - POWER SUM X-TALK



Configuration B

Conan 7mm B NEXT[%] - Total NEXT : 6.90%		
From	To	Risetime = 50 ps (10-90%)
Pair 1	Pair 2	-0.45
Pair 1	Pair 3	-3.24
Pair 1	Pair 4	-3.21

Conan 7mm B FEXT[%] - Total FEXT : 1.22%		
From	To	Risetime = 50 ps (10-90%)
Pair 1	Pair 6	0.45
Pair 1	Pair 7	-0.39
Pair 1	Pair 8	-0.38

Conan 7mm B NEXT[%] - Total NEXT : 3.82%		
From	To	Risetime = 50 ps (10-90%)
Pair 2	Pair 1	-0.45
Pair 2	Pair 3	-0.13
Pair 2	Pair 4	-3.24

Conan 7mm B FEXT[%] - Total FEXT : 0.93%		
From	To	Risetime = 50 ps (10-90%)
Pair 2	Pair 5	0.45
Pair 2	Pair 7	0.10
Pair 2	Pair 8	-0.38

Conan 7mm B NEXT[%] - Total NEXT : 3.82%		
From	To	Risetime = 50 ps (10-90%)
Pair 3	Pair 1	-3.24
Pair 3	Pair 2	-0.13
Pair 3	Pair 4	-0.45

Conan 7mm B FEXT[%] - Total FEXT : 0.94%		
From	To	Risetime = 50 ps (10-90%)
Pair 3	Pair 5	-0.40
Pair 3	Pair 6	0.09
Pair 3	Pair 8	0.45

Conan 7mm B NEXT[%] - Total NEXT : 6.91%		
From	To	Risetime = 50 ps (10-90%)
Pair 4	Pair 1	-3.21
Pair 4	Pair 2	-3.24
Pair 4	Pair 3	-0.45

Conan 7mm B FEXT[%] - Total FEXT : 1.26%		
From	To	Risetime = 50 ps (10-90%)
Pair 4	Pair 5	-0.40
Pair 4	Pair 6	-0.41
Pair 4	Pair 7	0.45