Breakout Design: Package, Traces and Near Package Flyover Connector Part 2

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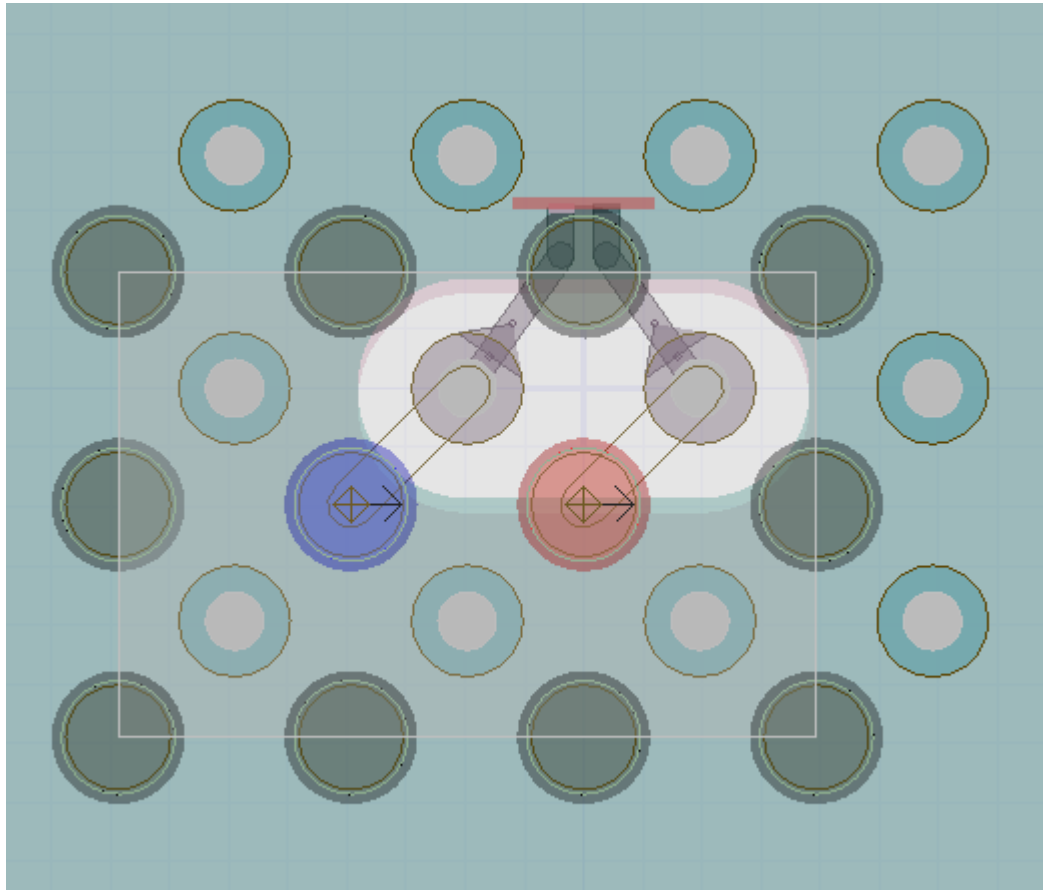
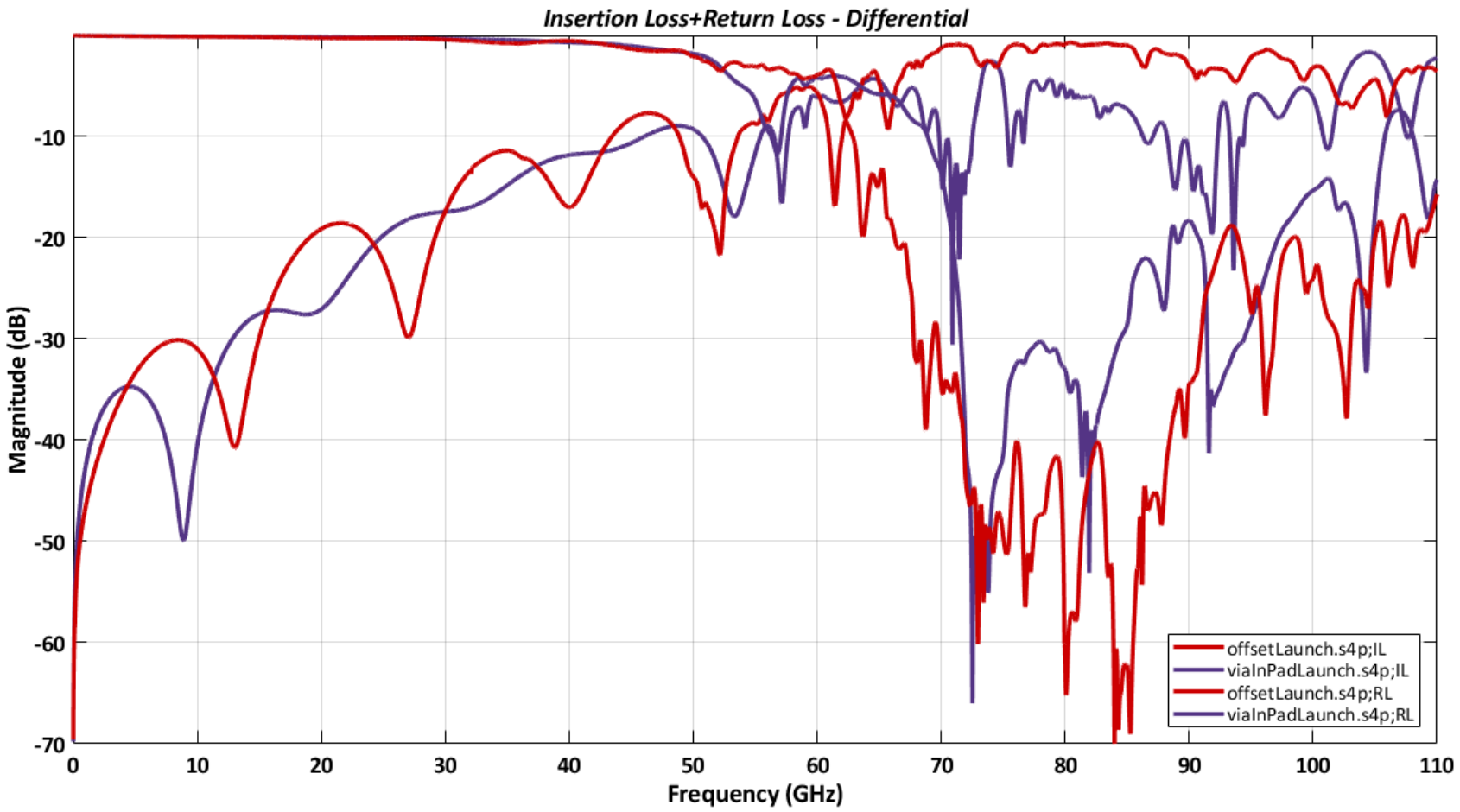
Revisiting
BGA Offset Via Launch

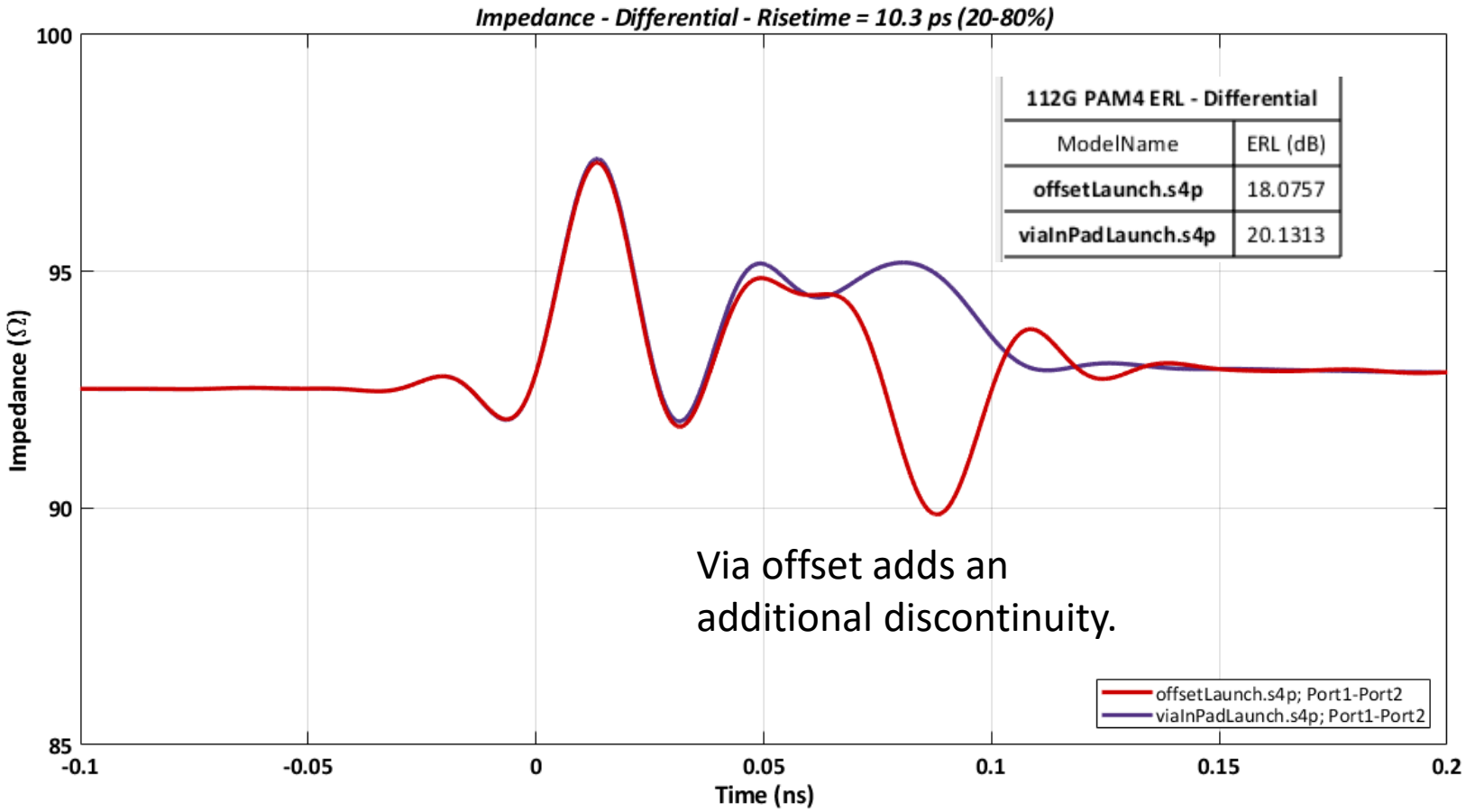


Vias offset from BGA pads by (0.5 mm, 0.5 mm)

IL/RL comparison
Via-In-Pad vs. Offset



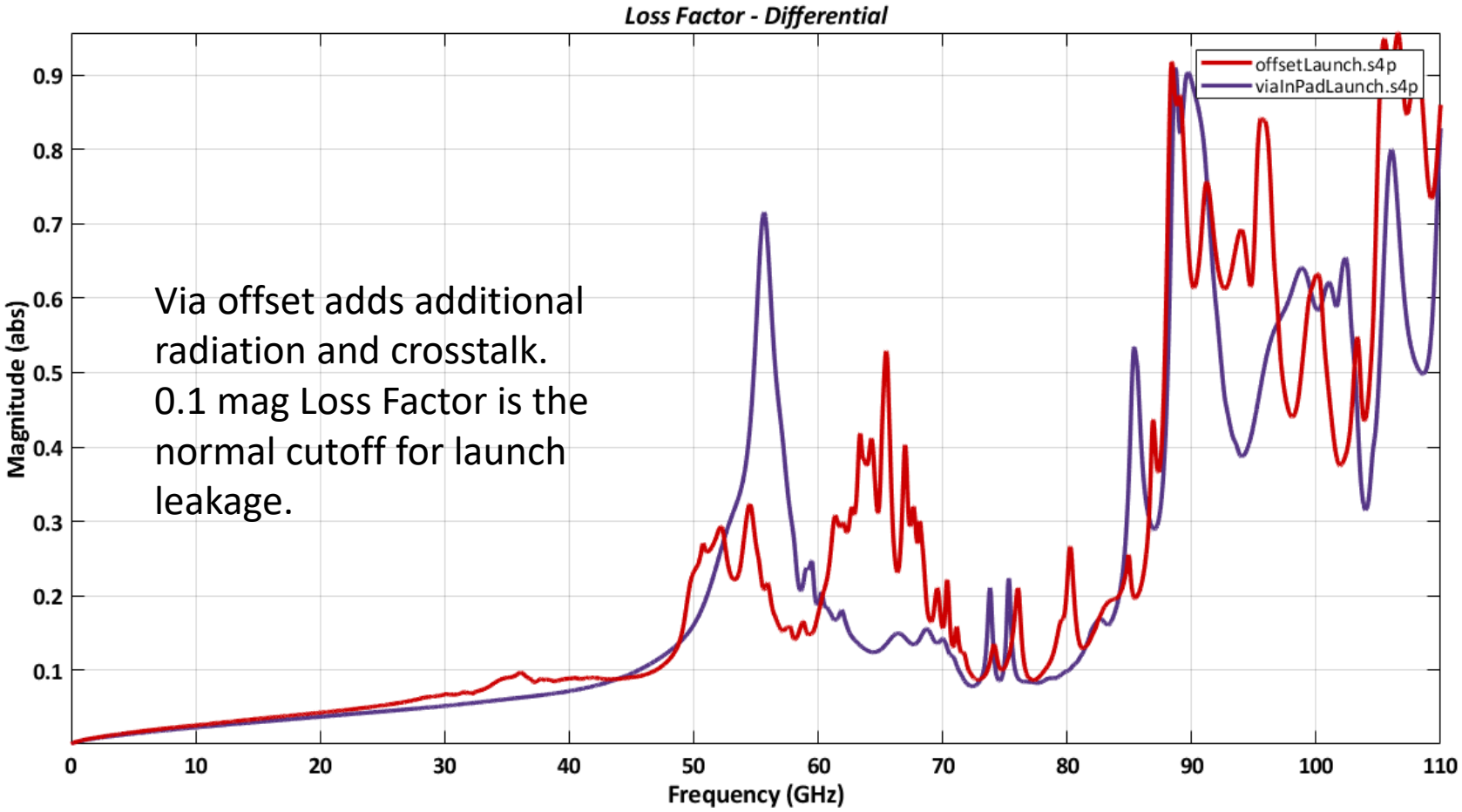
112 Gbps TDR from Trace Side



112G PAM4 ERL - Differential	
ModelName	ERL (dB)
offsetLaunch.s4p	18.0757
viaInPadLaunch.s4p	20.1313

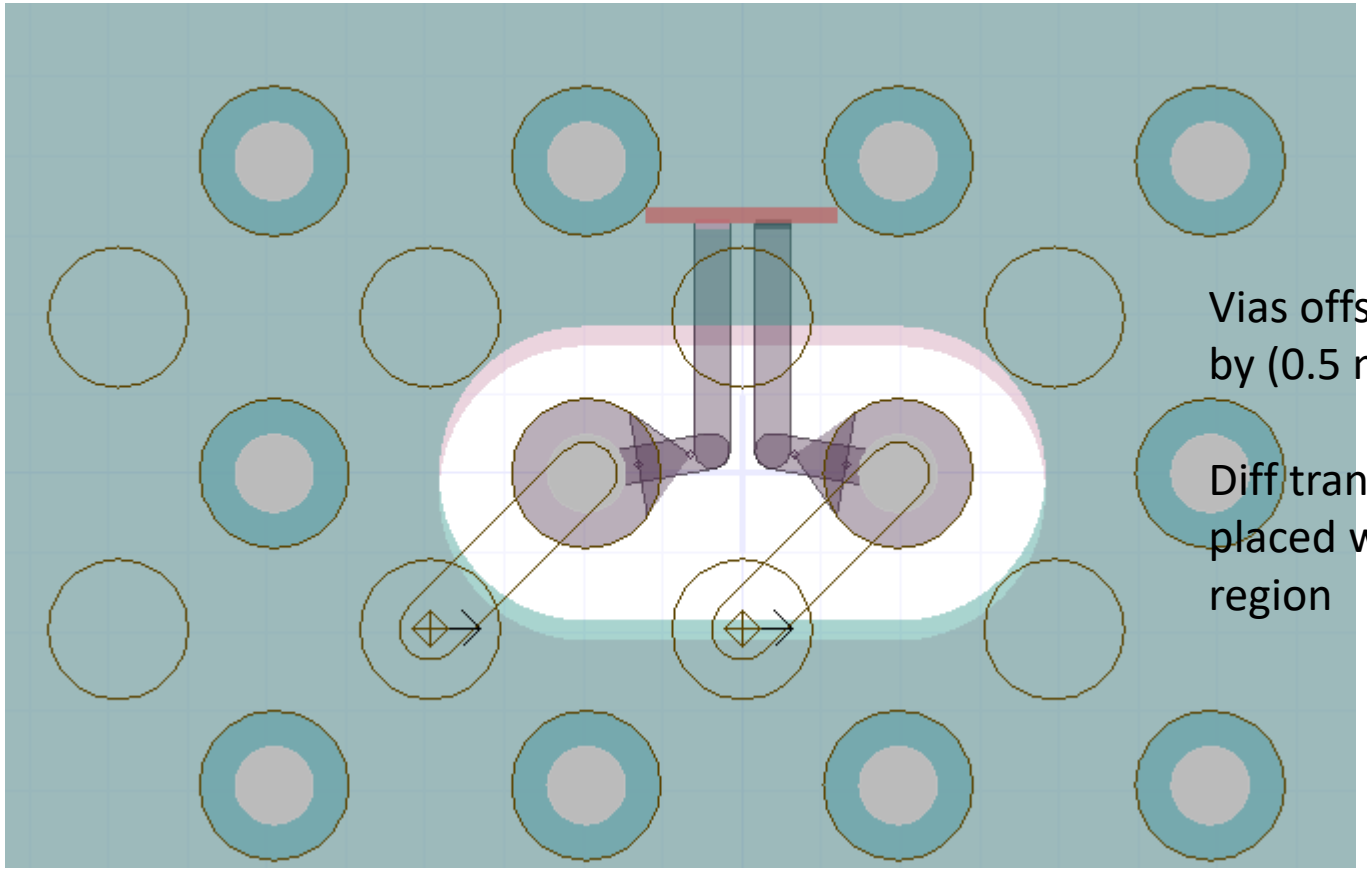
Via offset adds an additional discontinuity.

Loss Factor



Via offset adds additional radiation and crosstalk.
0.1 mag Loss Factor is the normal cutoff for launch leakage.

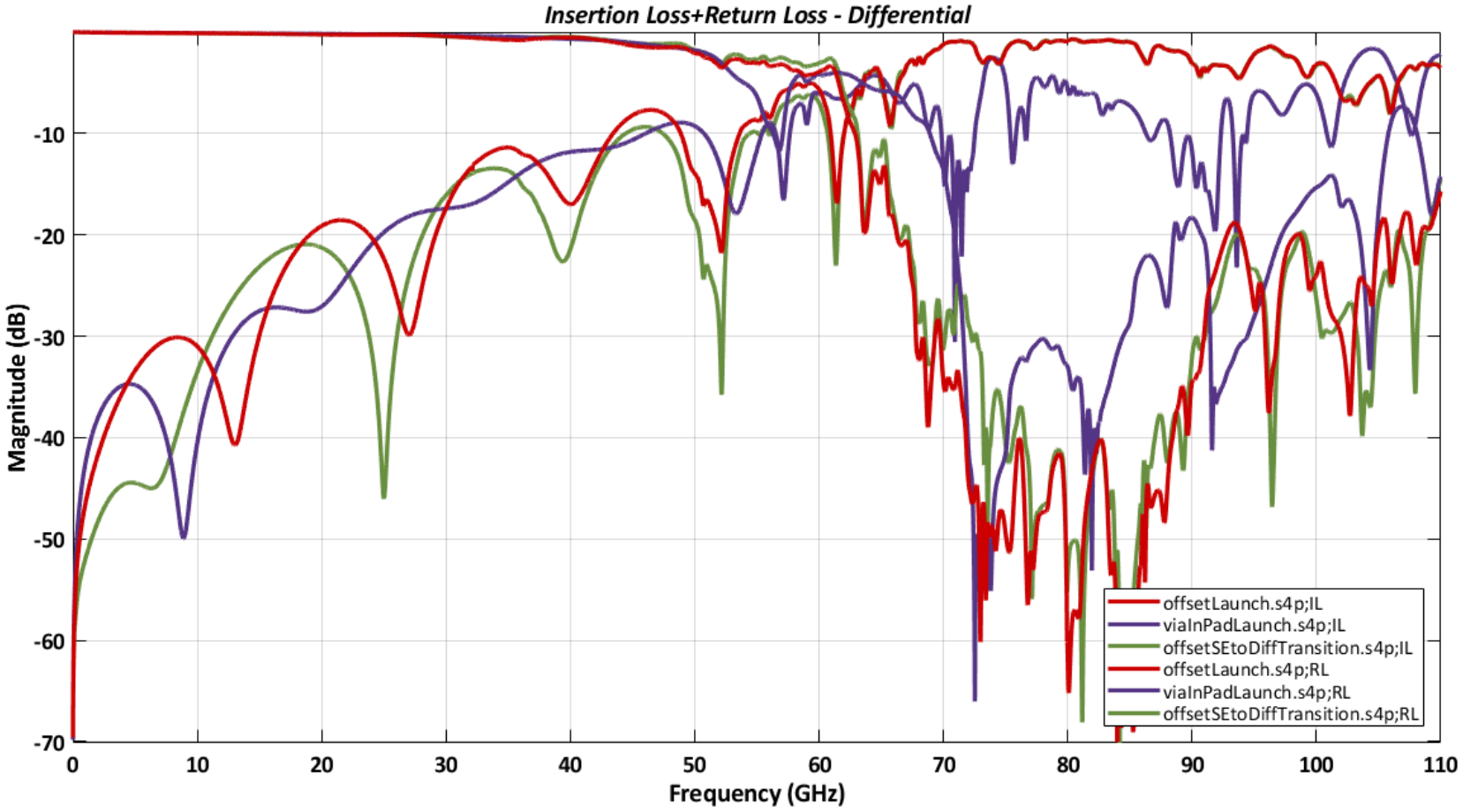
BGA Package Offset Launch with Diff Transition Moved Inside Antipad



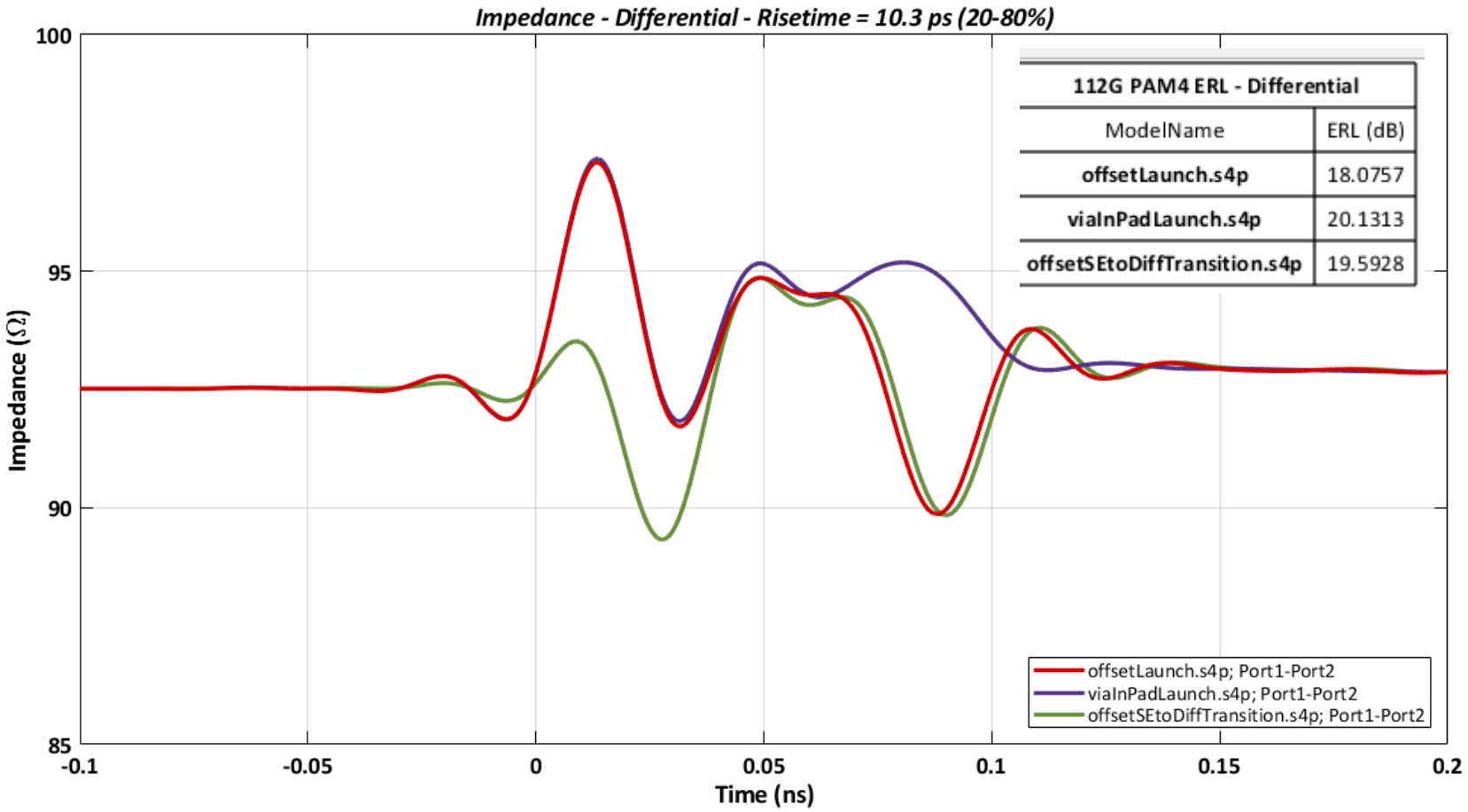
Vias offset from BGA pads by (0.5 mm, 0.5 mm)

Diff transition point placed within the antipad region

IL/RL comparison

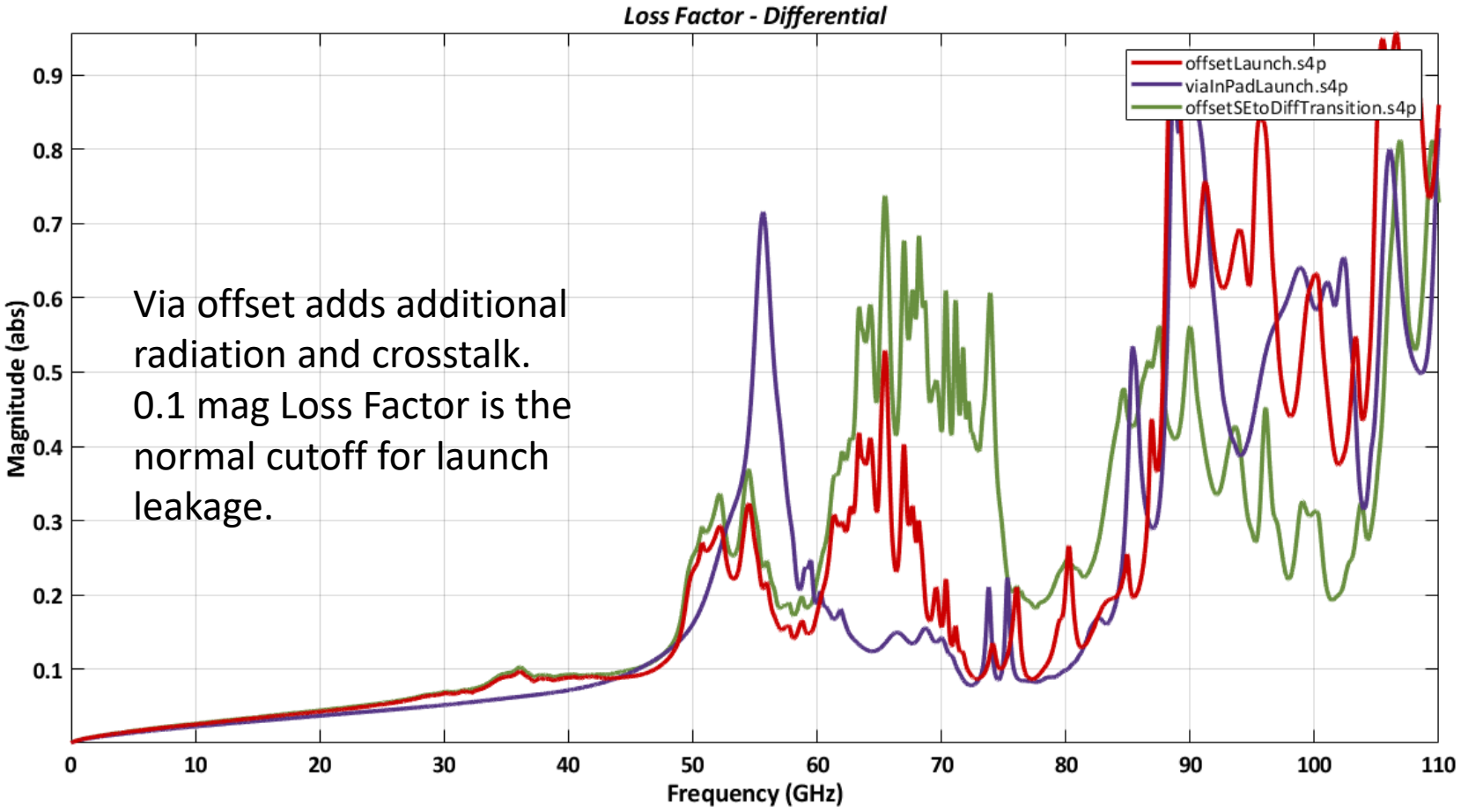


112 Gbps TDR from Trace Side



112G PAM4 ERL - Differential	
ModelName	ERL (dB)
offsetLaunch.s4p	18.0757
viaInPadLaunch.s4p	20.1313
offsetSEtoDiffTransition.s4p	19.5928

Loss Factor

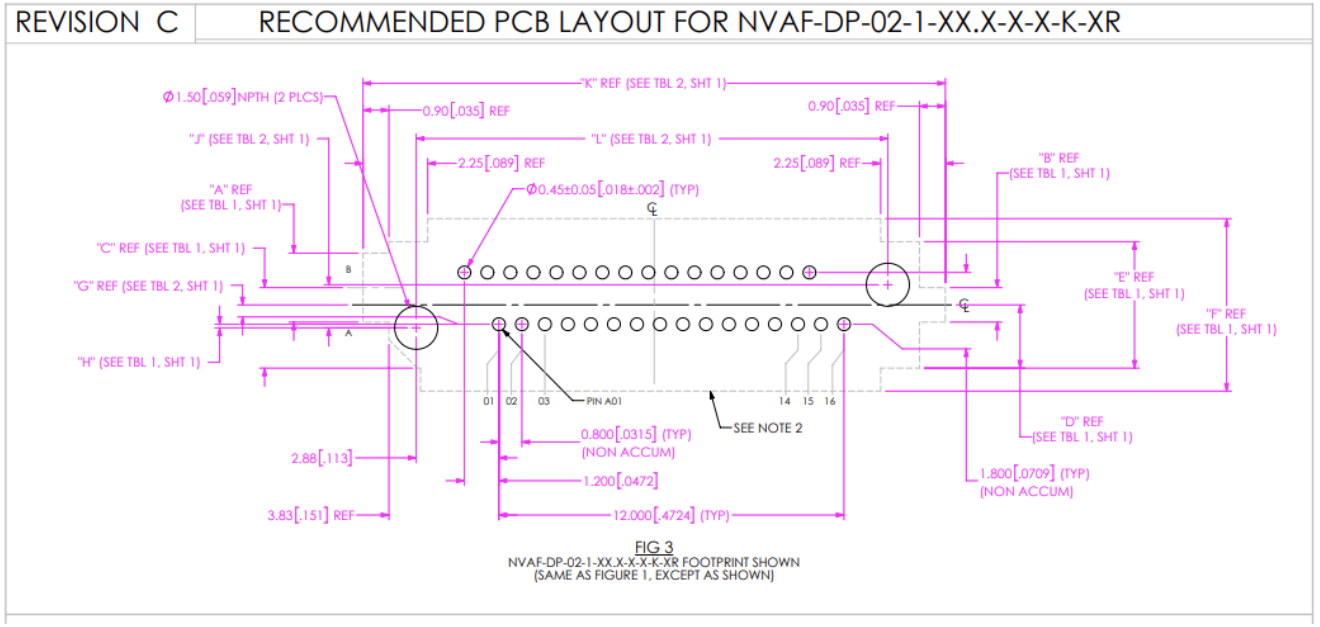


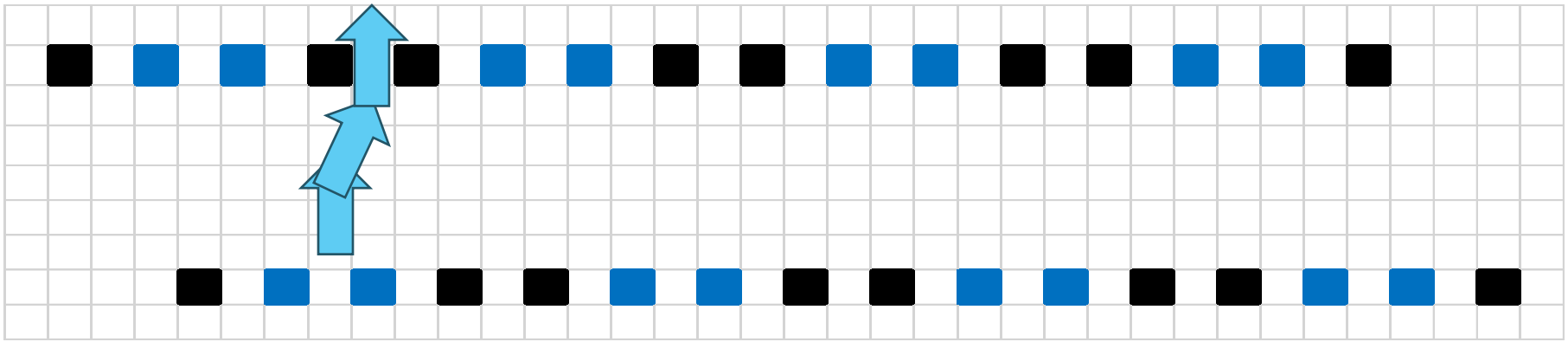
Via offset adds additional radiation and crosstalk.
0.1 mag Loss Factor is the normal cutoff for launch leakage.

Novaray Cable-To-Board

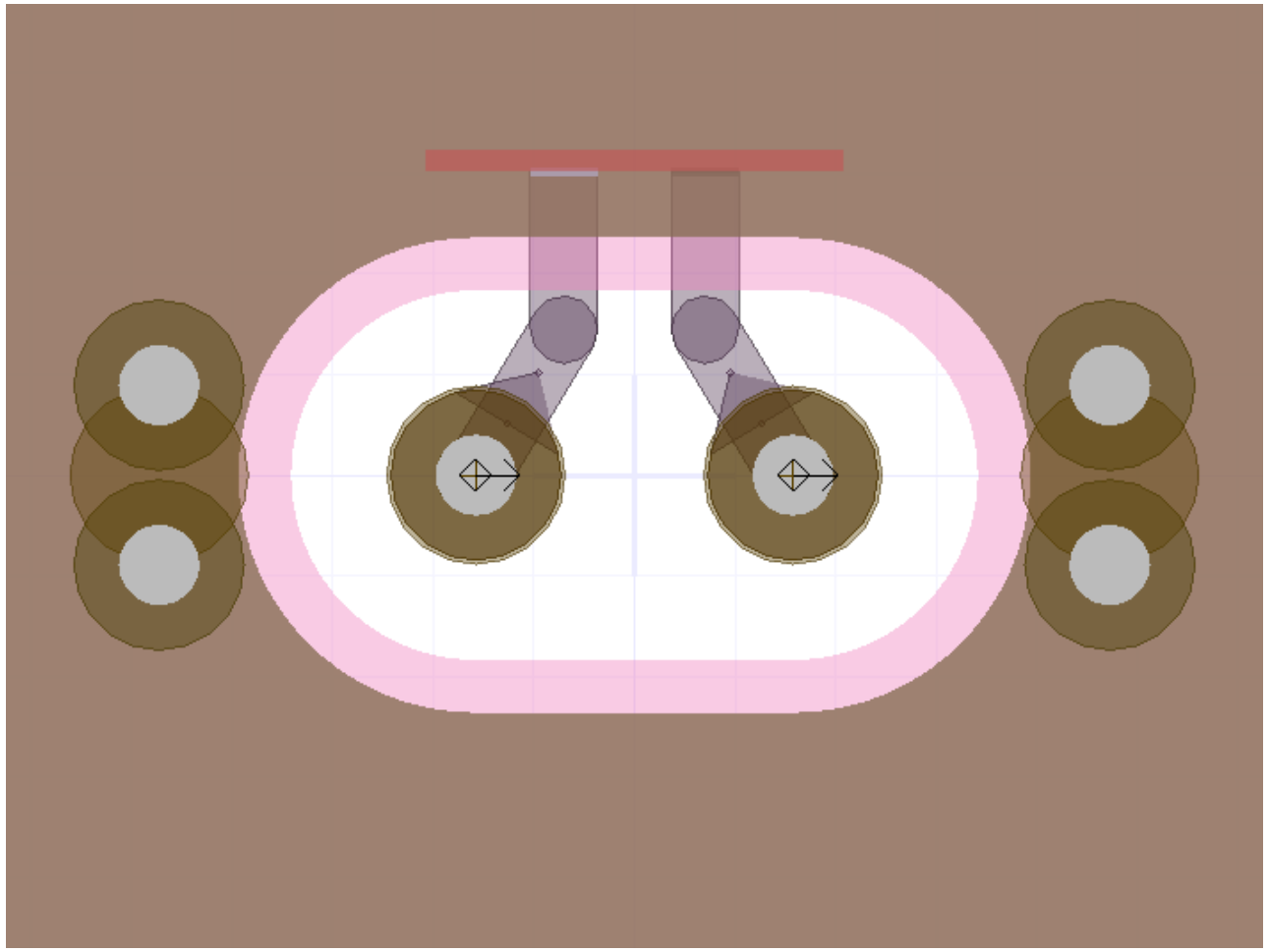
BOARD-TO-BOARD		CABLE-TO-BOARD
Current Product Line	Roadmap	Current Product Line
		
7, 10 and 12 mm stack heights	72 pairs	Vertical
8, 12, 16, 24 and 32 pairs	Micro rugged backplane	8, 12, 16, 24, and 32 pairs
		I/O solution: 16 and 32 pairs (8 pairs on roadmap)

Novaray Pin Assignments

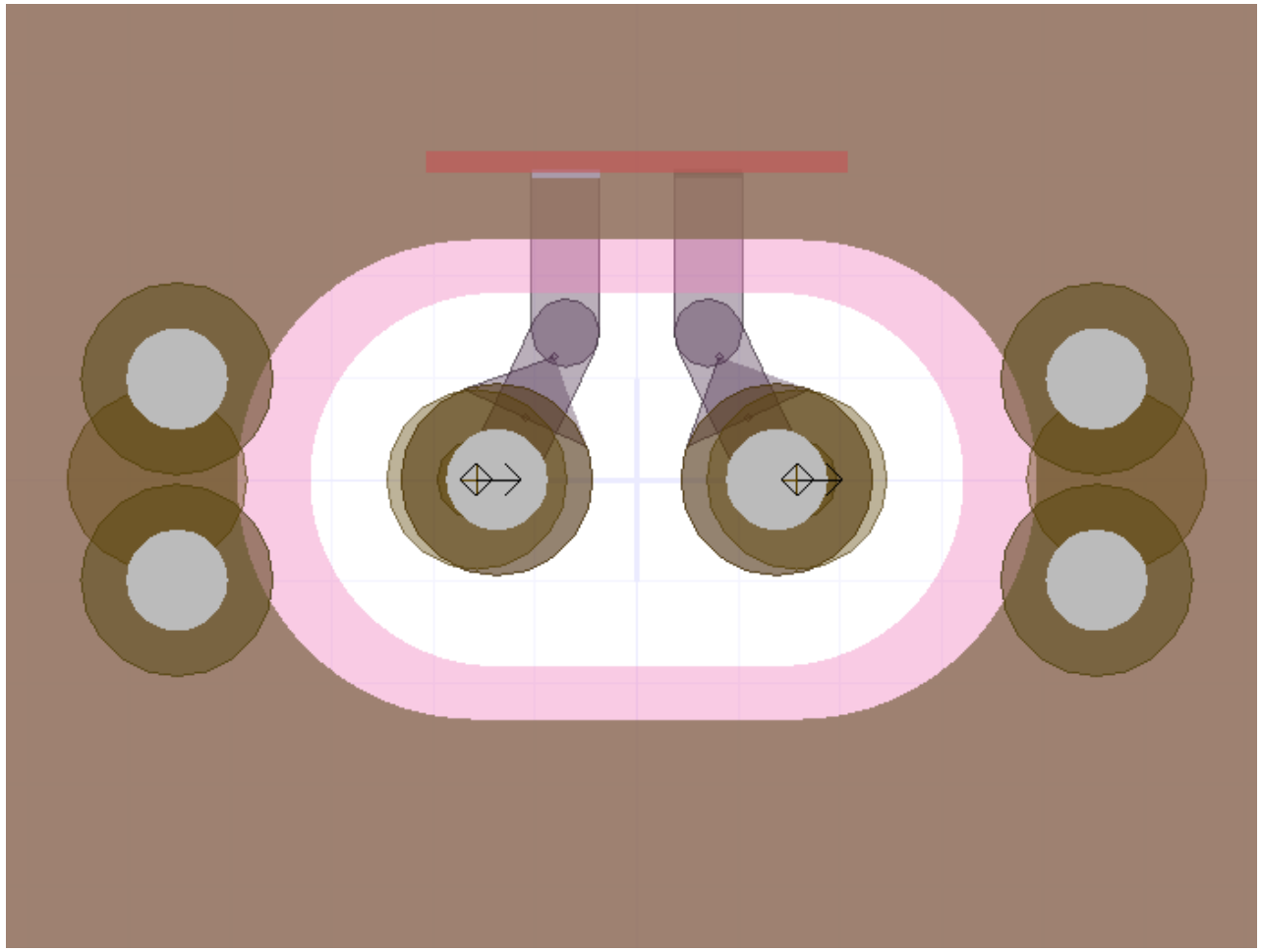




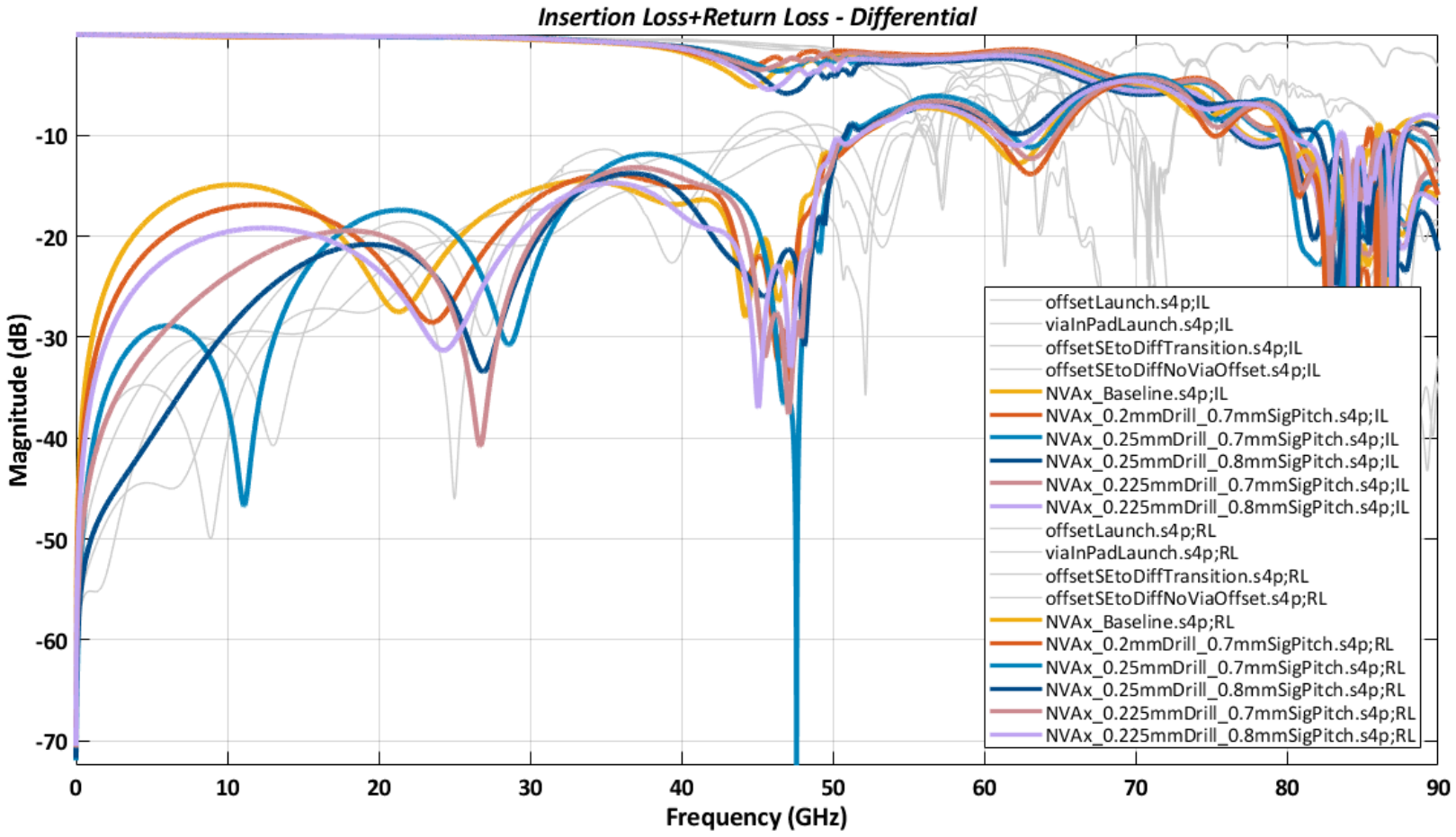
Novaray 0.8 mm sig pitch 0.2 mm drill



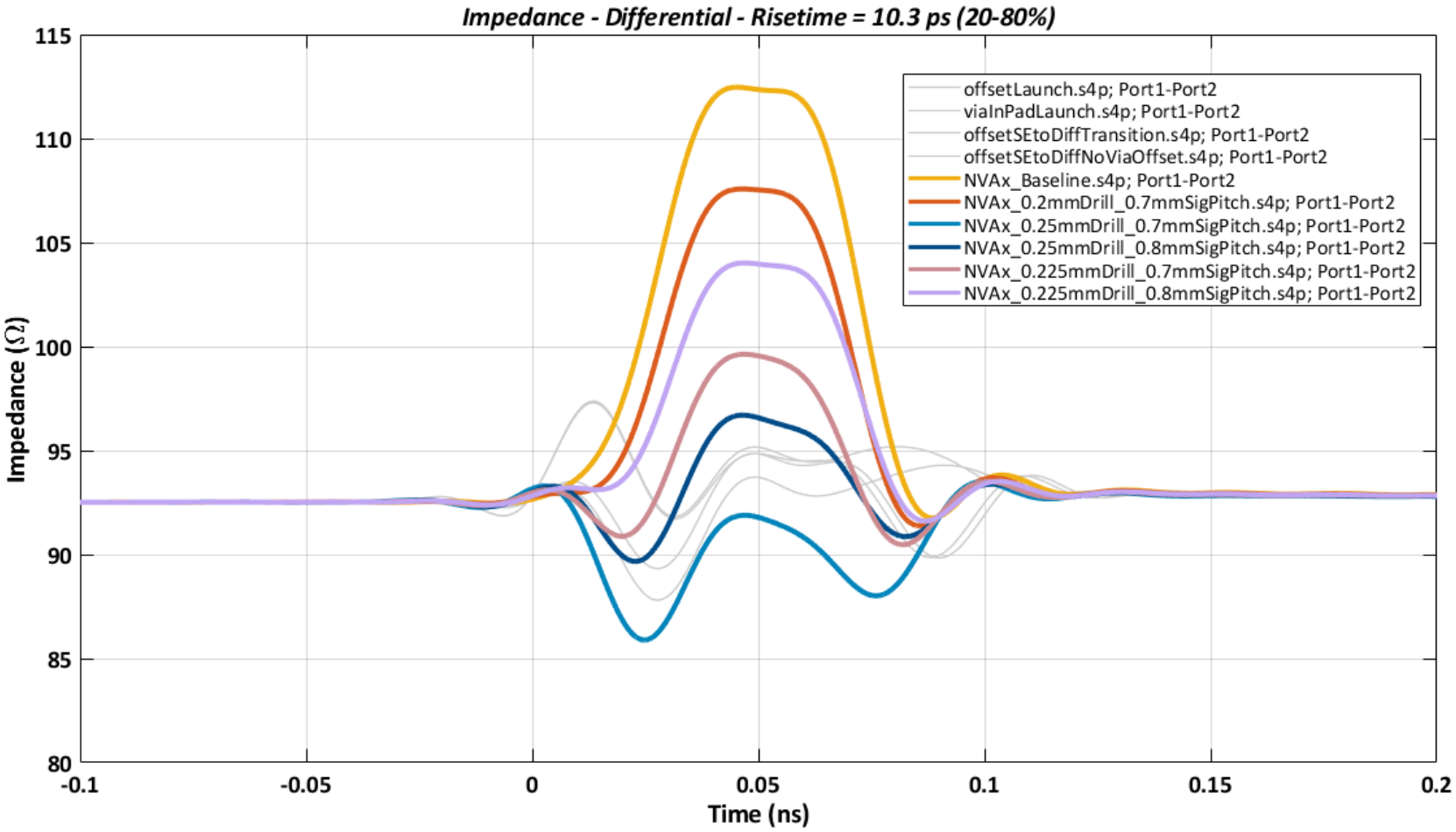
Novaray 0.7 mm sig pitch
0.25 mm drill



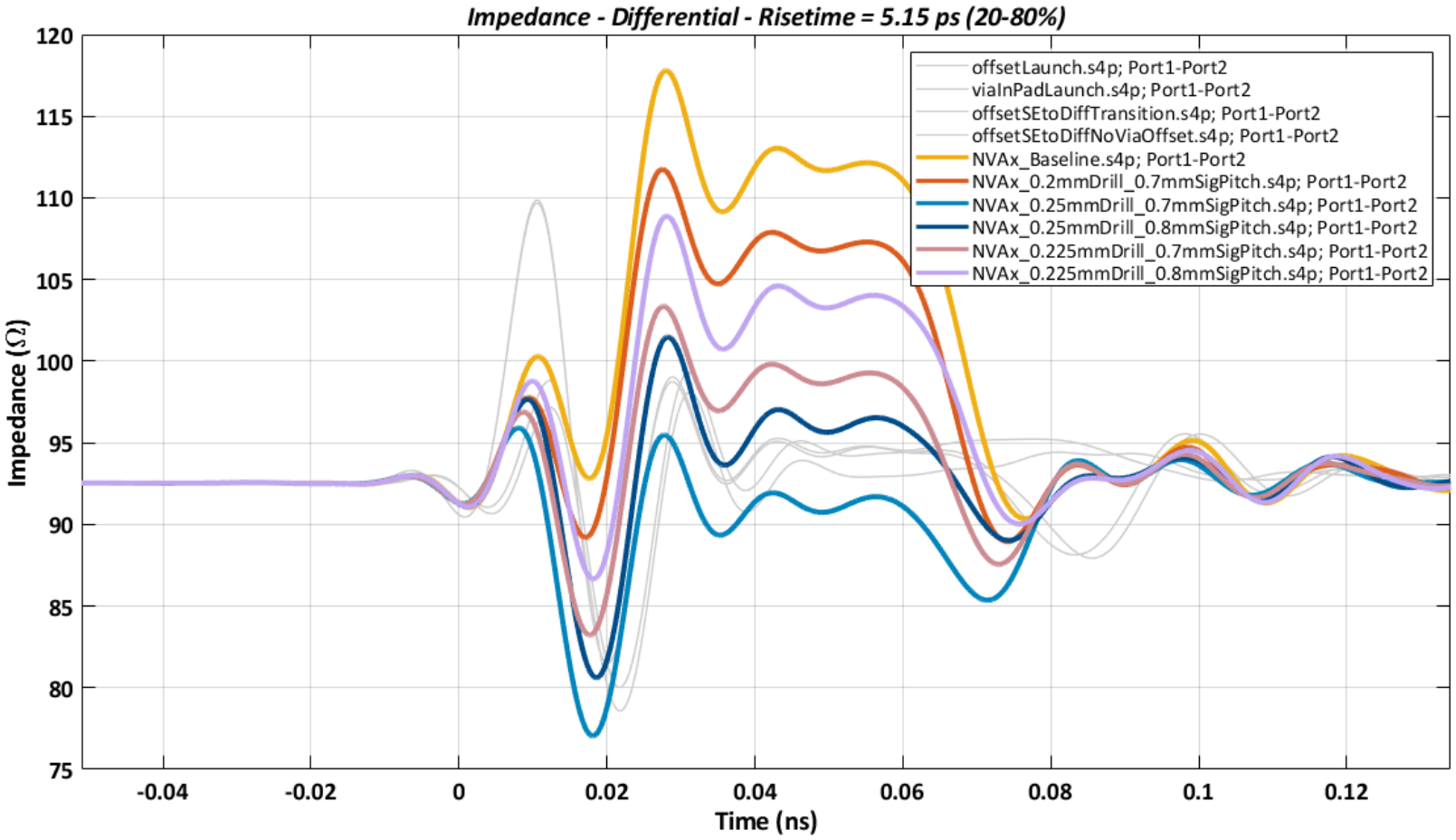
Novaray Launch Preliminary Opt
0.2,0.225, 0.25 mm drill – 0.8 and 0.7 pitch



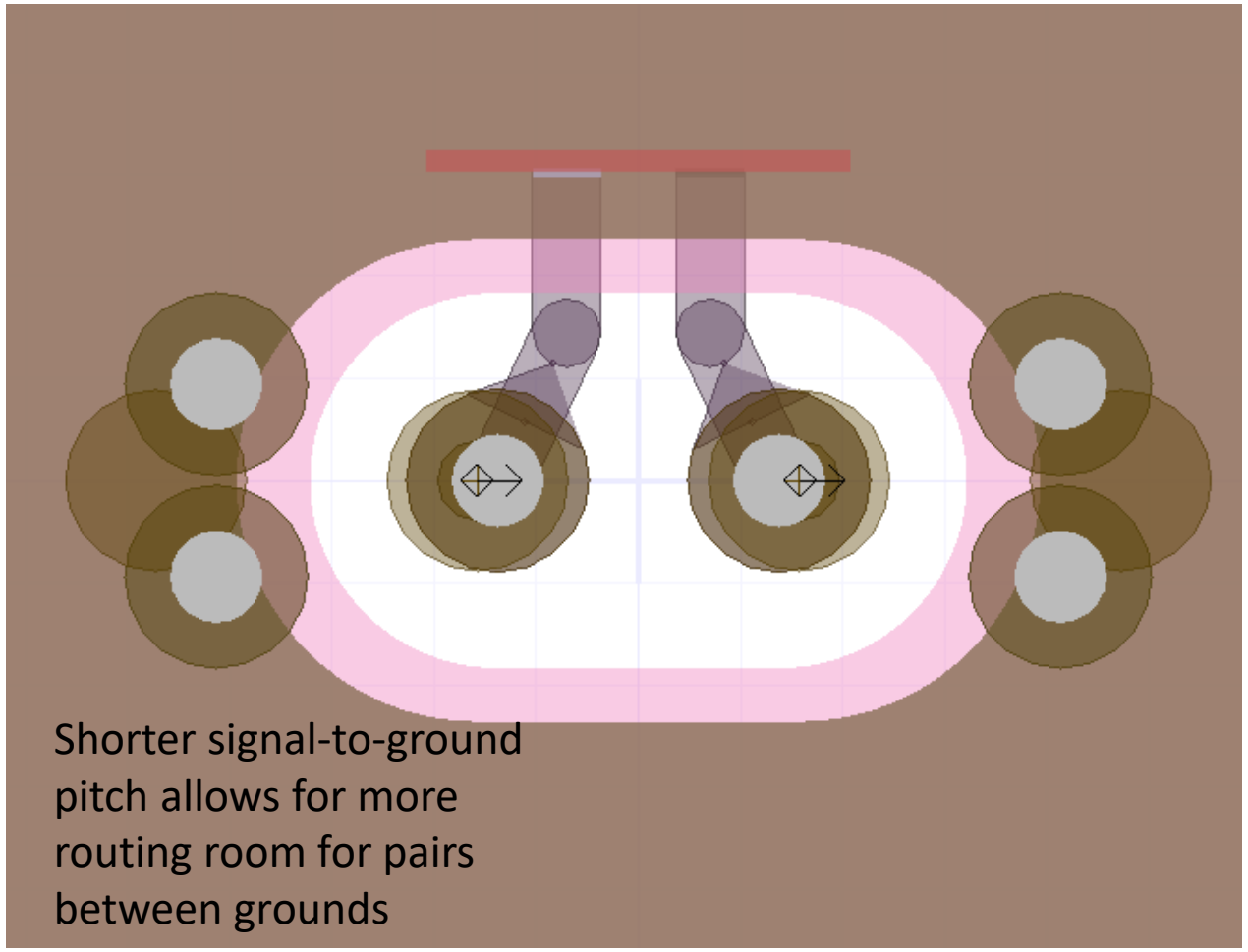
TDR from Trace @ 10.3 ps 20/80% Rise



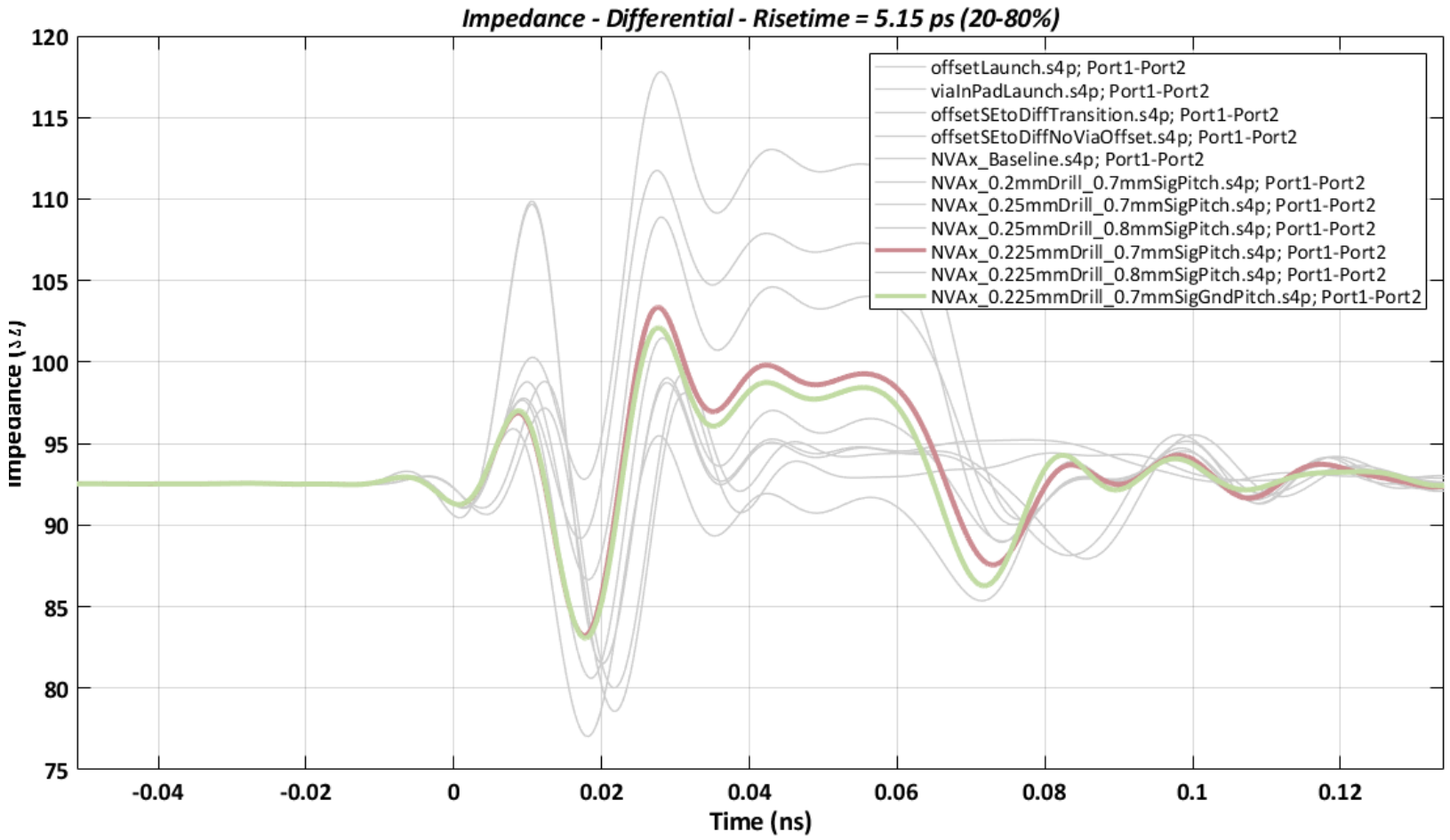
TDR from Trace @ 5.15 ps 20/80% Rise



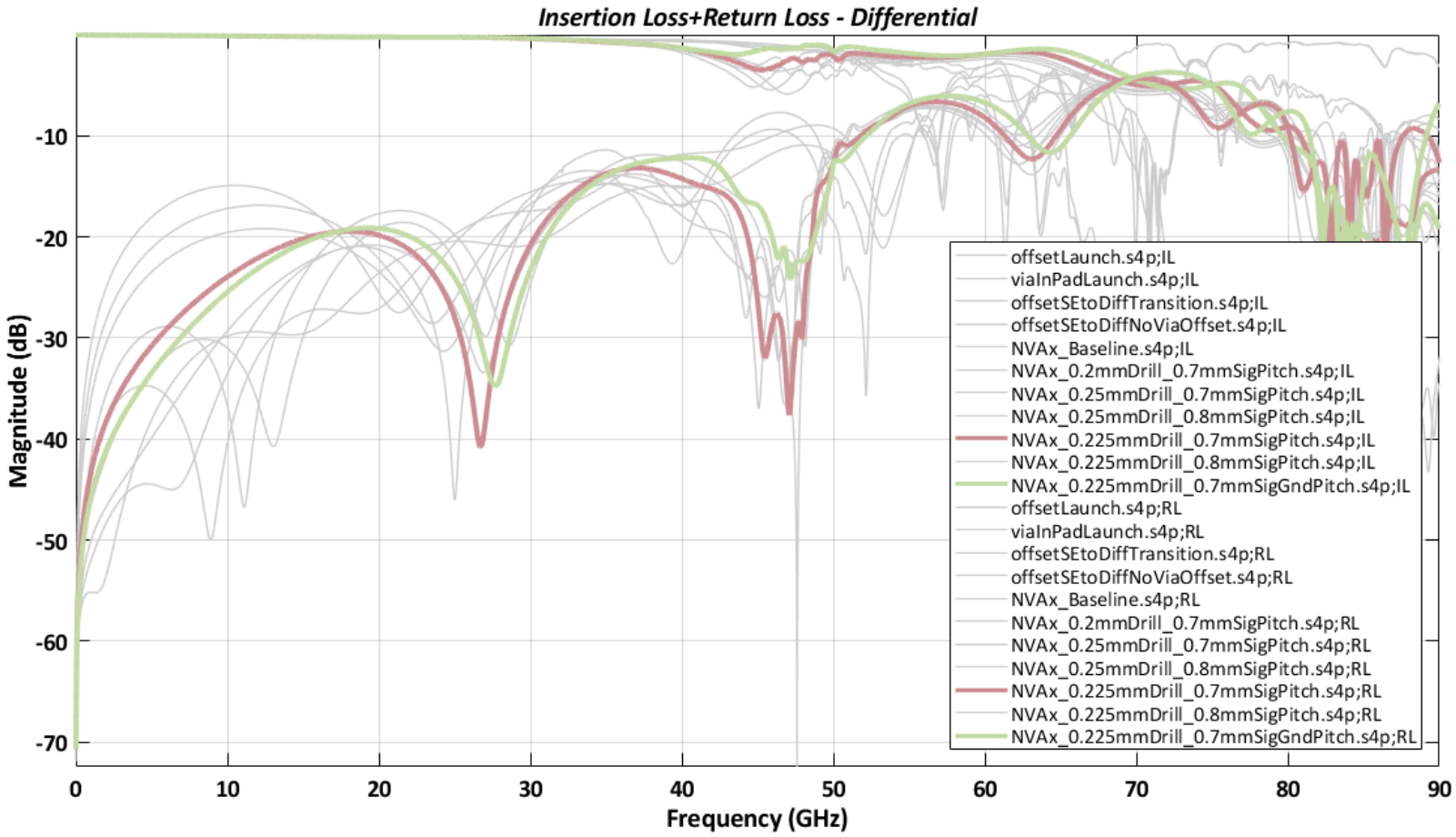
Novaray 0.7 mm sig pitch, 0.7 mm gnd pitch 0.225 mm drill



Impact of Moving Ground Pitch to 0.7mm TDR



Impact of Moving Ground Pitch to 0.7mm IL/RL



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To be continued ….

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