



ELECTRICAL MODEL DOCUMENTATION

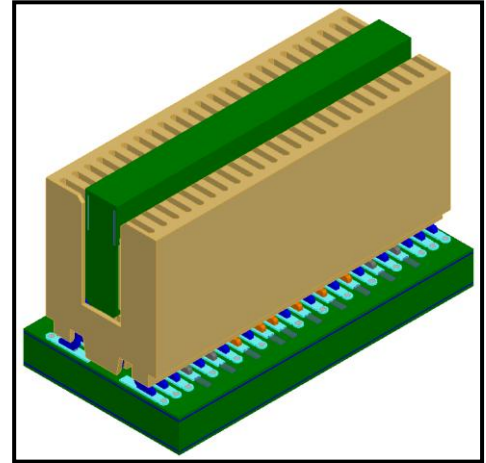
MODEL DESCRIPTION

This is a S-parameter model for DDR4 mini DIMM Vertical SMT mated connector.

Main board includes 1.4mm thick board and includes 0.508mm of microstrip with width of 0.16mm.

Module card includes edge finger size of 2.25mm X 0.35mm on 1.4mm thick board and includes 0.508mm of microstrip with width of 0.16mm. All internal ground layers are 100% recessed underneath gold-fingers.

Both main board and module card have 4 layers and a dielectric constant of 3.7 was used for the modeled board material.



APPLICABLE SERIES NUMBER:

151105

MODEL FILENAME: SP-151105-0001_rev1.s24p	MODEL FORMAT: Touchstone (*.sNp)
MODEL TYPE: S-parameter	DATA FORMAT: Magnitude/Phase
MODEL BASIS: Analytical 3D Field Solution	MODEL SOURCE: Ansys HFSS ver. 2014
BANDWIDTH: DC – 20 GHz	RESOLUTION: 10 MHz Steps
REFERENCE: 50 ohms	NUMBER OF POINTS: 2001 (2000 + 1 DC)
NUMBER OF PORTS : 24 Single-Ended	VALIDATION: TS-151105-0001

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Any charts or schematics in this report are only for general reference. The schematic allows the user to configure a similar simulation circuit in any simulation tool. The resulting charts provided allow a comparison of results to the Molex simulation using the stated schematic.

REVISION: 1	ECN INFORMATION: EC No: S2016-0403 DATE: 2015/10/27	TITLE: DDR4 MiniDIMM 0.5mm Pitch Vertical SMT Connector	SHEET No. 1 of 10
DOCUMENT NUMBER: EE-151105-0001	CREATED / REVISED BY: WHFOO 2015/10/27	CHECKED BY: CMWONG 2015/10/27	APPROVED BY: WTCHUA 2015/10/27



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TERMINAL TO MODEL PORT MAPPING TABLE

AVAILABLE MODEL SIGNAL PATHS

TERMINAL	INPUT PORT (MAIN BOARD SIDE)	DESCRIPTION	OUTPUT PORT (MODULE BOARD SIDE)	DESCRIPTION
Front Terminal P63	1	SMT_F1	13	A_F1
Front Terminal P65	2	SMT_F2	14	A_F2
Front Terminal P67	3	SMT_F3	15	A_F3
Front Terminal P69	4	SMT_F4	16	B_F4
Front Terminal P70	5	SMT_F5	17	B_F5
Front Terminal P72	6	SMT_F6	18	B_F6
Back Terminal P207	7	SMT_B1	19	A_B1
Back Terminal P209	8	SMT_B2	20	A_B2
Back Terminal P211	9	SMT_B3	21	A_B3
Back Terminal P213	10	SMT_B4	22	B_B4
Back Terminal P214	11	SMT_B5	23	B_B5
Back Terminal P216	12	SMT_B6	24	B_B6

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PRE-DEFINED MODEL RETURN PATHS

TERMINAL	DESCRIPTION
Front Terminal P56	G
Front Terminal P57	G
Front Terminal P58	G
Front Terminal P60	G
Front Terminal P62	G
Front Terminal P64	G
Front Terminal P66	G
Front Terminal P68	G
Front Terminal P71	G
Front Terminal P73	G
Front Terminal P75	G
Front Terminal P77	G
Front Terminal P78	G
Front Terminal P79	G

TERMINAL	DESCRIPTION
Back Terminal P200	G
Back Terminal P201	G
Back Terminal P202	G
Back Terminal P204	G
Back Terminal P206	G
Back Terminal P208	G
Back Terminal P210	G
Back Terminal P212	G
Back Terminal P215	G
Back Terminal P217	G
Back Terminal P219	G
Back Terminal P221	G
Back Terminal P222	G
Back Terminal P223	G

PRE-DEFINED MODEL TERMINATED PATHS

TERMINAL	DESCRIPTION
Front Terminal P59	50Ω Terminated
Front Terminal P61	50Ω Terminated
Front Terminal P74	50Ω Terminated
Front Terminal P76	50Ω Terminated

TERMINAL	DESCRIPTION
Back Terminal P203	50Ω Terminated
Back Terminal P205	50Ω Terminated
Back Terminal P218	50Ω Terminated
Back Terminal P220	50Ω Terminated

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REFERENCE LAYER STACK

MAINBOARD LAYER STACK

Layer	Property	Thickness [mm]
Layer 1	Signal	0.048768
FR4		0.1016
Layer 2	Ground	0.03302
FR4		1.016
Layer 3	Ground	0.3302
FR4		0.1016
Layer 4	Signal	0.048768
	Total	1.42

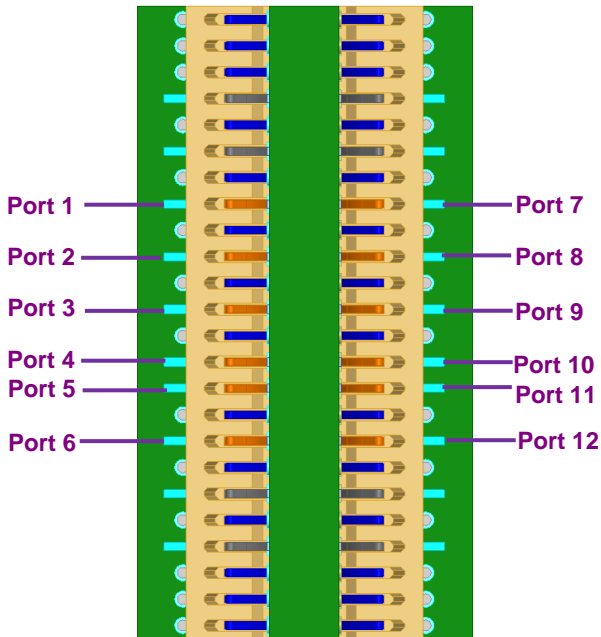
MODULE CARD LAYER STACK

Layer	Property	Thickness [mm]
Layer 1	Signal	0.048768
FR4		0.1016
Layer 2	Ground	0.03302
FR4		1.016
Layer 3	Ground	0.3302
FR4		0.1016
Layer 4	Signal	0.048768
	Total	1.42

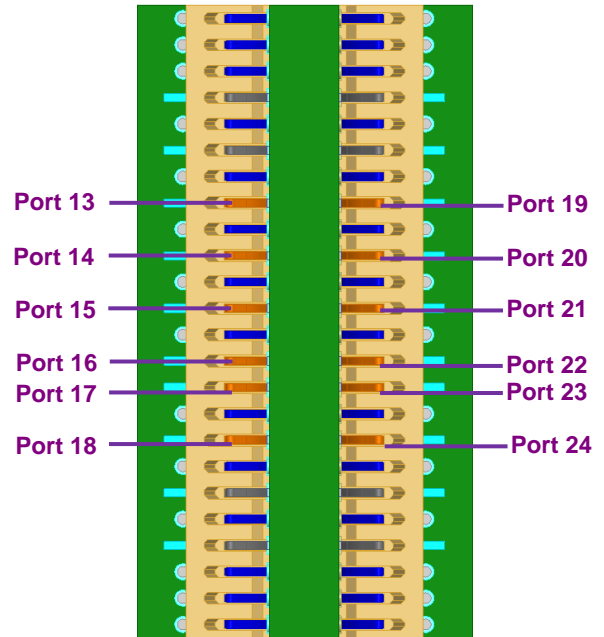
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PART ILLUSTRATIONS

Main Board (Top View)

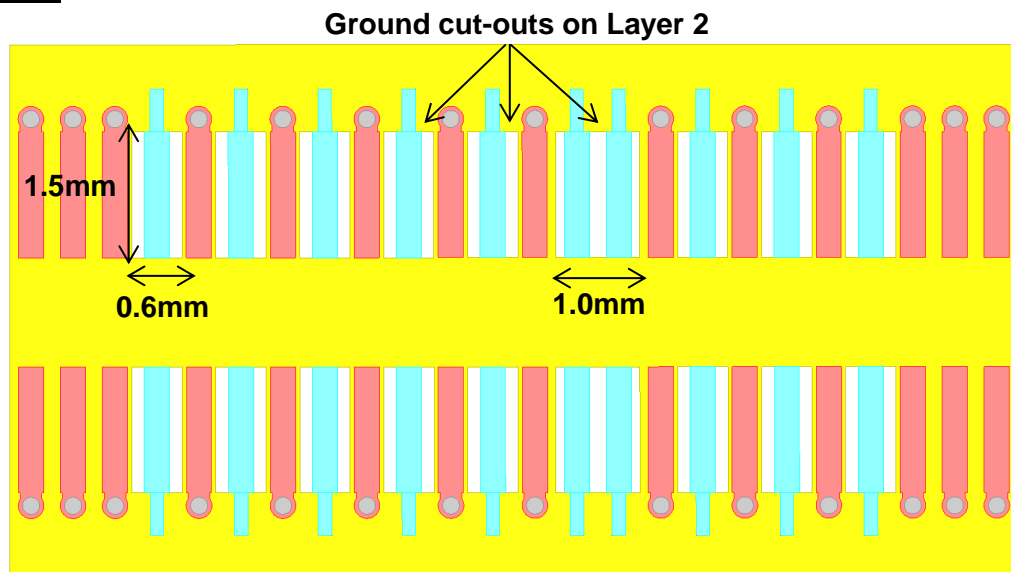


Connector (Top View)



Legend:
 Blue – Grounded
 Grey – Terminated
 Orange – Signals

Anti-pad Details



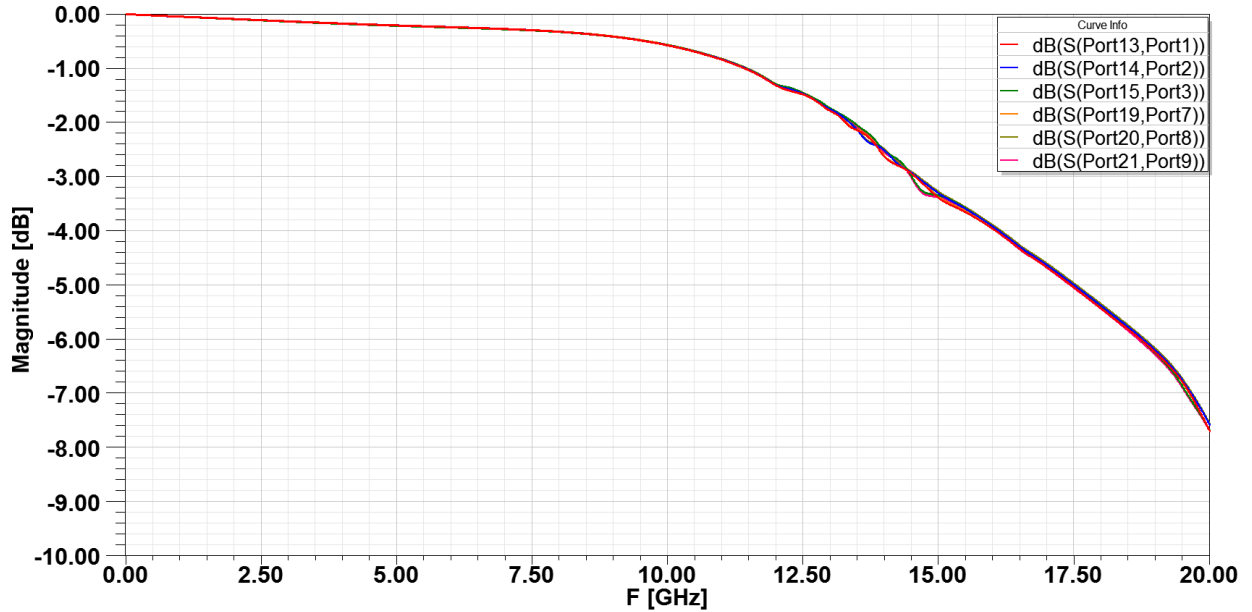
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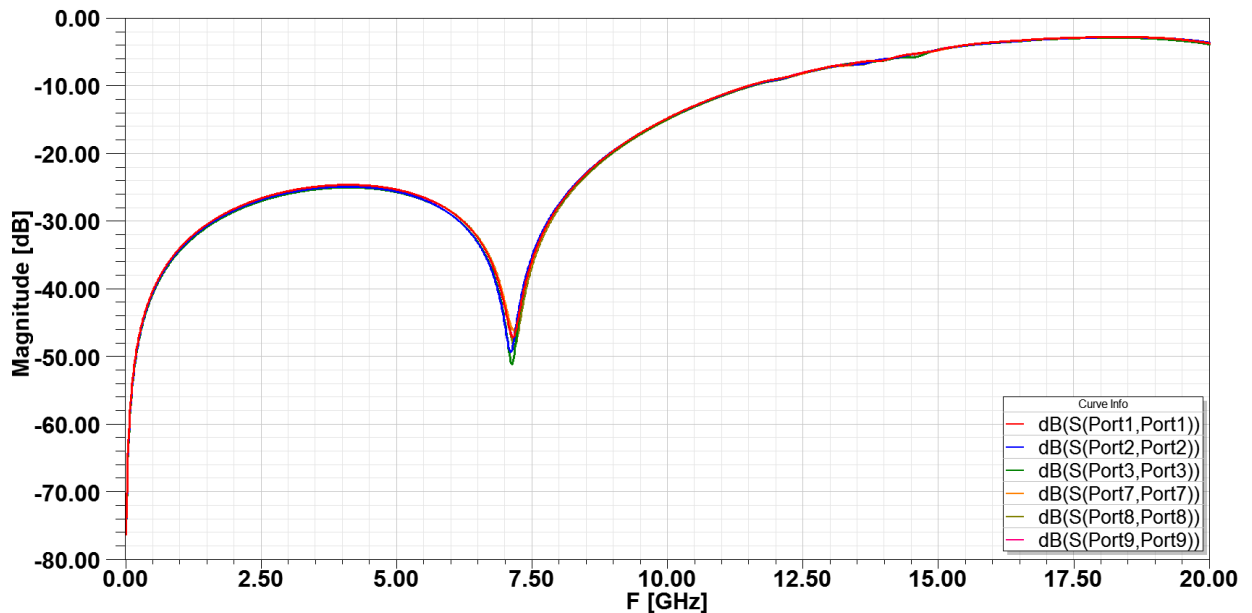
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REFERENCE RESULTS

Frequency Domain: Insertion Loss



Frequency Domain: Return Loss



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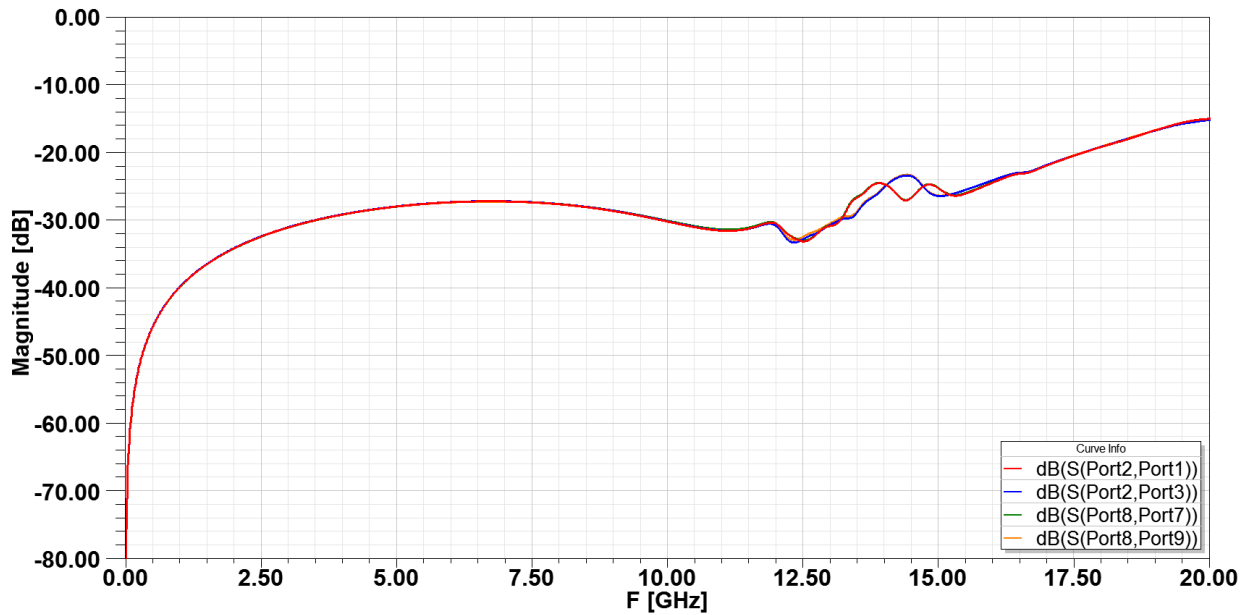


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REFERENCE RESULTS

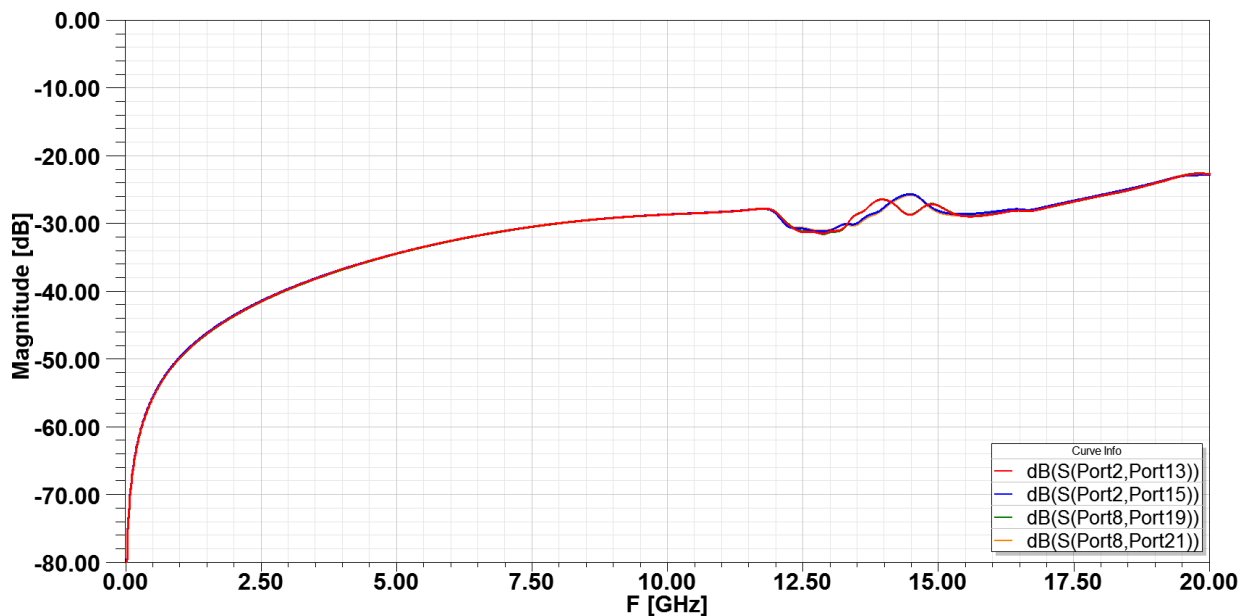
Frequency Domain: Near End Crosstalk

- 1:1 S/G ratio
- Both victim and aggressor located at same row



Frequency Domain: Far End Crosstalk

- 1:1 S/G ratio
- Both victim and aggressor located at same row



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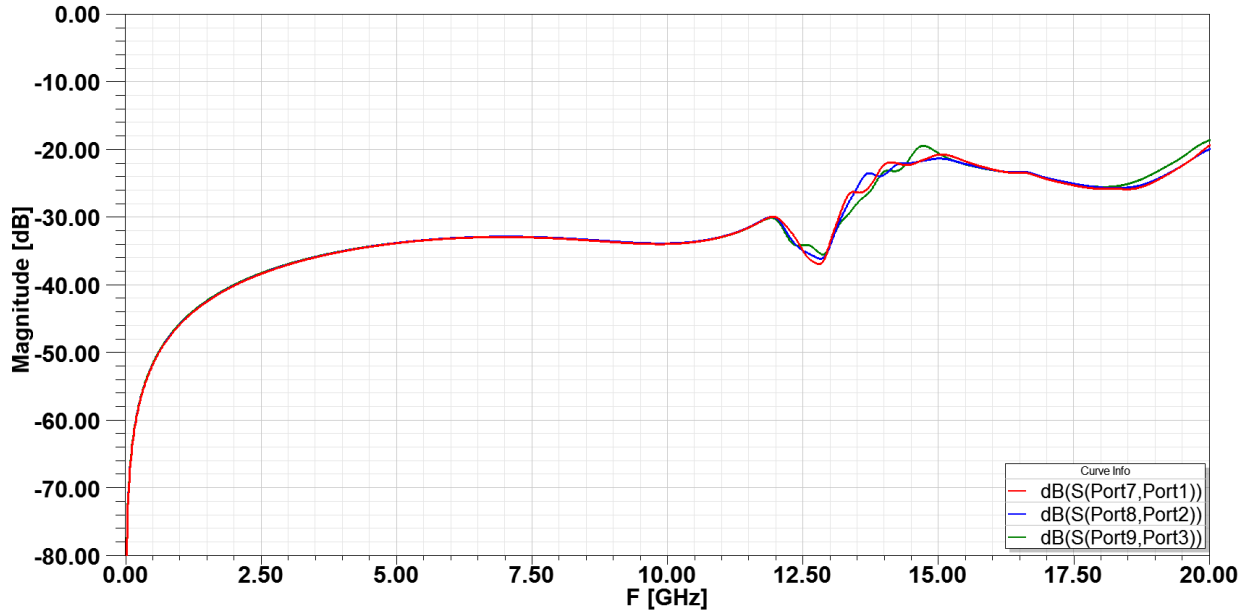


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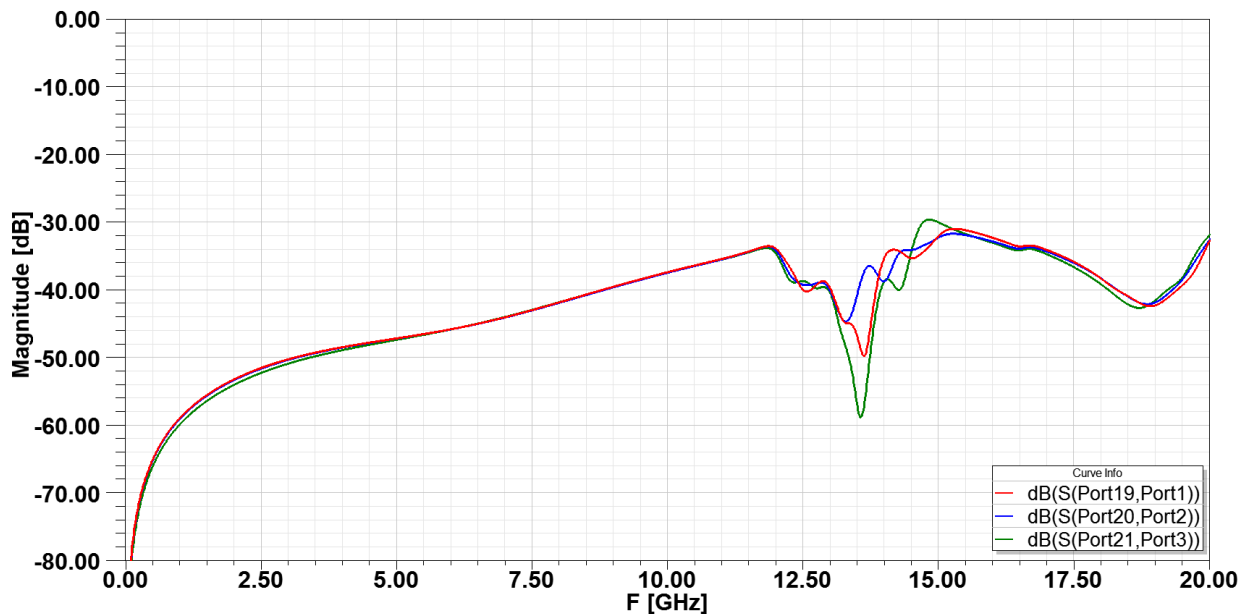
Frequency Domain: Near End Crosstalk

- 1:1 S/G ratio
- Victim locates from front side
- Aggressor locates from back side.



Frequency Domain: Far End Crosstalk

- 1:1 S/G ratio
- Victim locates from front side
- Aggressor locates from back side.



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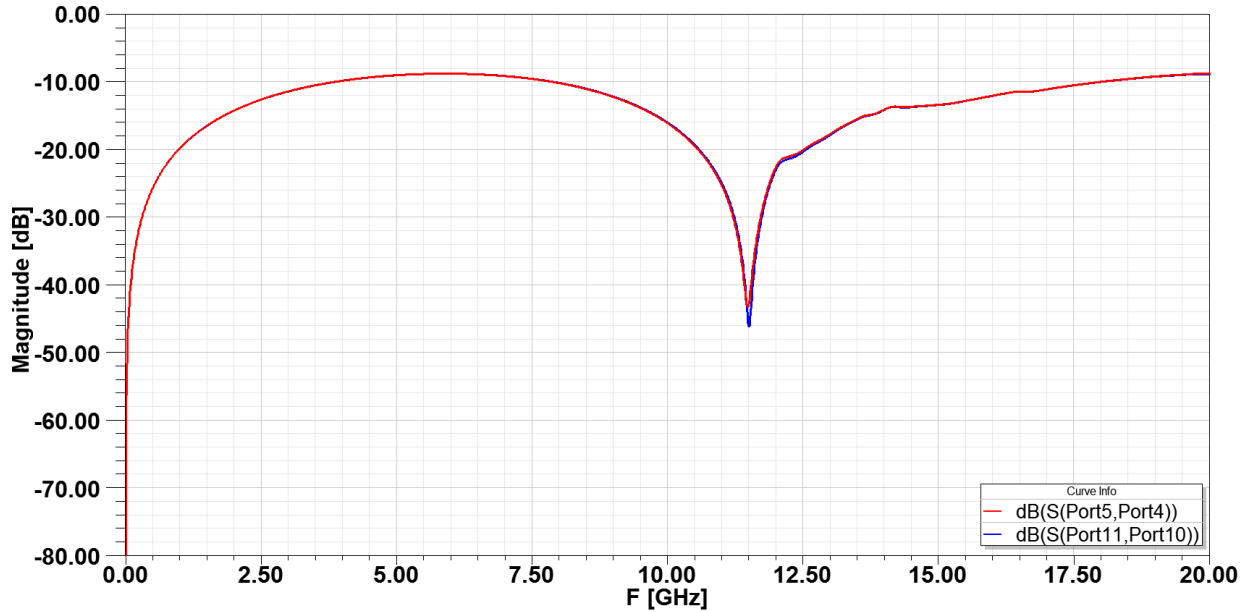


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REFERENCE RESULTS

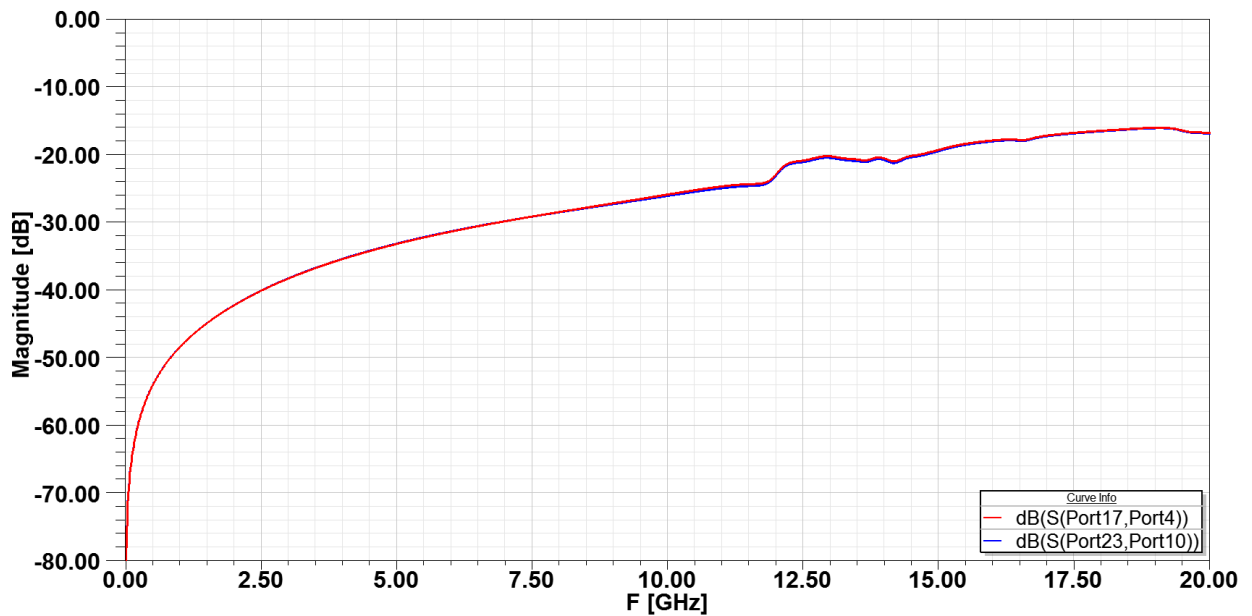
Frequency Domain: Near End Crosstalk

- 2:1 S/G ratio



Frequency Domain: Far End Crosstalk

- 2:1 S/G ratio



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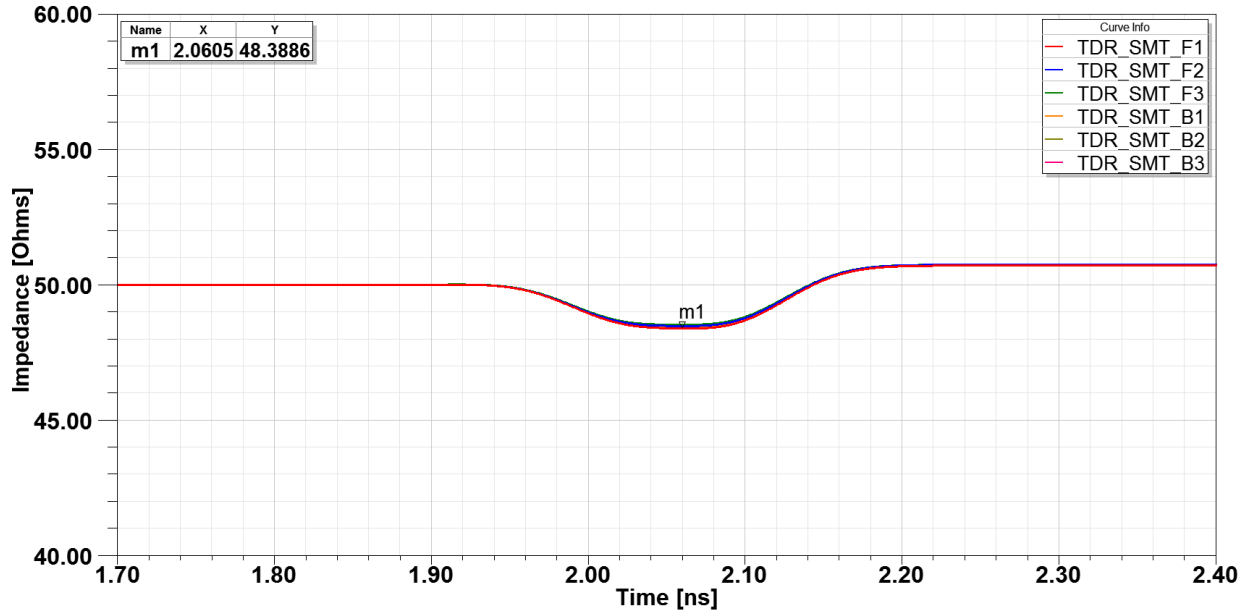


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REFERENCE RESULTS

Time Domain: TDR Impedance

- Rise-time of 100ps [10%~90%] at connector launch



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