



ELECTRICAL MODEL REPORT

MODEL SUMMARY

This is an electrical model of the zSFP+ connector. This connector supports 10 Gbps Ethernet and 16 Gbps Fiber Channel applications with the ability to support 25/28 Gbps applications.

This model can be used as a standalone model for analysis of connector performance or with other models to complete a channel.

Further information regarding this connector product line and other related Molex zSFP+ products can be found at <http://www.molex.com/>.

zSFP+ Connector



APPLICABLE PART NUMBER(S): 170382

MODEL TYPE: S-parameter	MODEL FORMAT: Touchstone (*.sNp)
MODEL FILENAME: SP-170382-0001_revC.s8p	DATA FORMAT: Real/Imaginary
MODEL BASIS: Analytical 3-D field solution	MODEL SOURCE: Ansoft HFSS version 14.0
BANDWIDTH: DC - 40.96 GHz	RESOLUTION: 10 MHz steps
REFERENCE: 50 ohms	NUMBER OF POINTS: 4097 (4096 + 1 DC)
NUMBER OF CHANNELS: 2 differential	NUMBER OF PORTS: 8 single-ended
CHANNEL TYPE: Coupled pairs + reference	VALIDATION: TS-170382-0001
MODEL APPLICATION: Fibre Channel, Ethernet	DATA RATE: 28 Gbps

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REVISION: C	ECN INFORMATION: EC No: UCP2012-3087 DATE: 03/19/2012	TITLE: Electrical Model Documentation zSFP+, Surface Mount MOLEX CONFIDENTIAL	SHEET No. 1 of 8
DOCUMENT NUMBER: EE-170382-0001	CREATED / REVISED BY: K. Balasubramanian	CHECKED BY: R. Benson	APPROVED BY: P. Casher



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MODEL DESCRIPTION

This model contains 2 differential pairs (and their associated grounds) arranged in a G-S-S-G format circuit board interfaces, which results in an 8-port, single-ended S-parameter matrix. Two power pins are not part of the ports. The signal path represented by the model consists of a surface-mount host card, and an edge card connector inserted into one side of the connector.

The electrical model was simulated using Ansoft HFSS in the Frequency domain. The frequency range of this simulation is from 0 GHz to 40.96 GHz. With Ansoft HFSS the DC values of the S-parameters are extrapolated from the lowest solved frequency (10 MHz).

CONDUCTOR TO PORT MAPPING TABLE

SIGNAL PATHS

Terminals (Host Board)	Ports (Host Board)	Ports (Edge Card)
12	1	2
13	3	4
18	5	6
19	7	8

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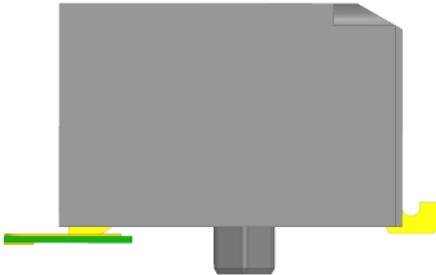


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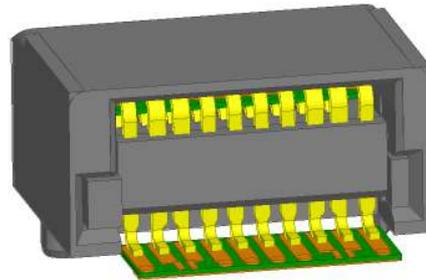
PART ILLUSTRATIONS

Connector

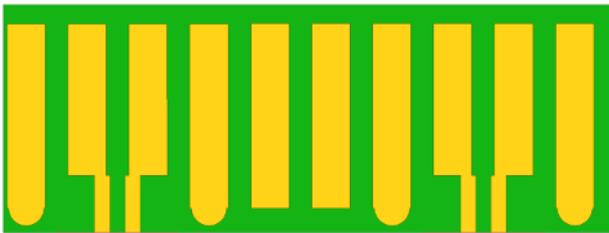
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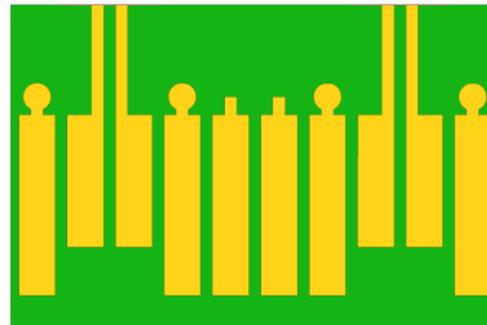
Perspective



Host Card



Edge Card



Host Board Construction Details

Thickness: 0.148mm
 Layers: 2 (Microstrip & Ground)
 Board Material: Dk=3.8, Df=0.015
 Copper: 1.5 oz. (.05mm)

Edge Card Pads

Pitch: 0.8 mm
 Ground: 3.0 x 0.6 mm
 Signal: 2.2 x 0.6 mm

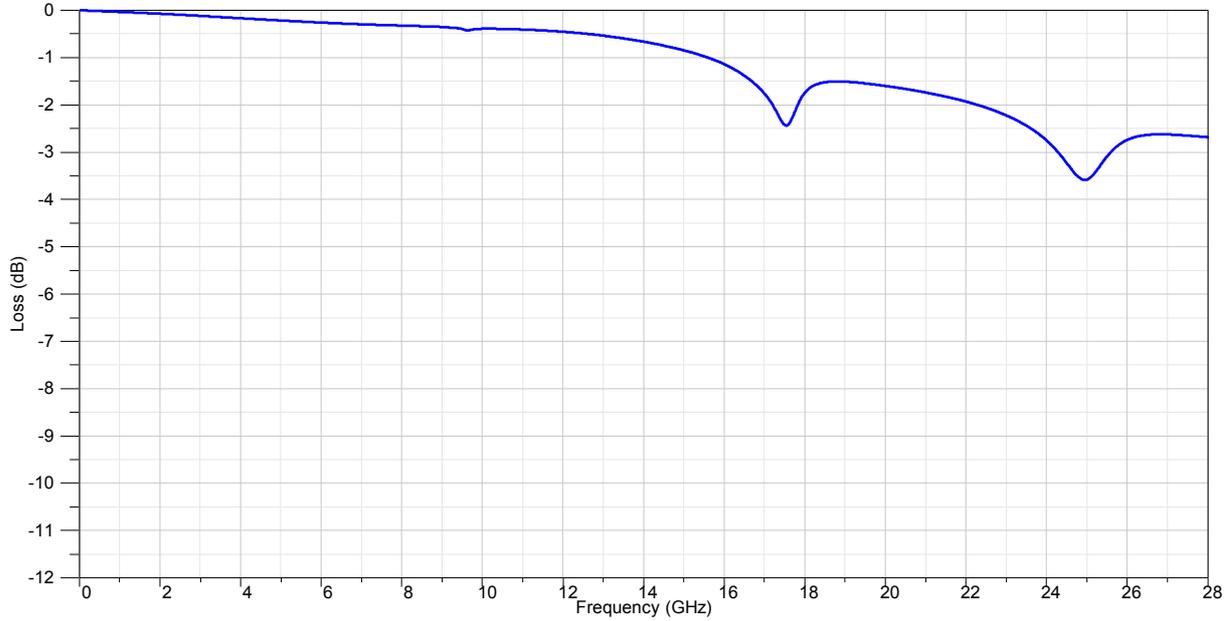
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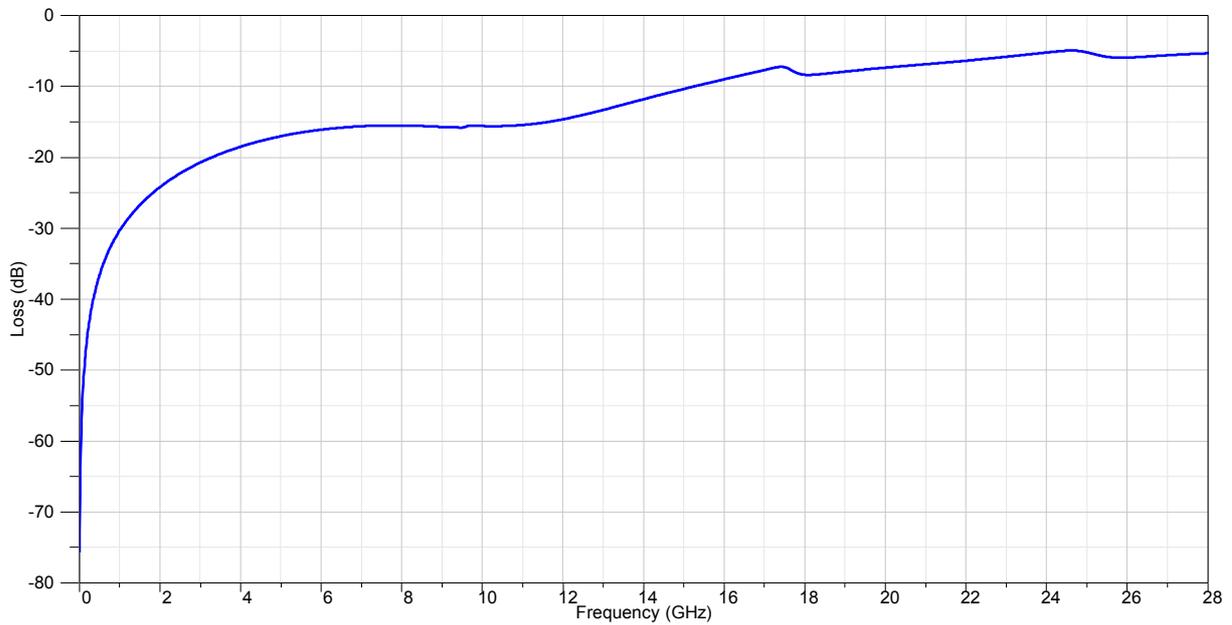
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REFERENCE RESULTS

Differential Insertion Loss



Differential Return Loss



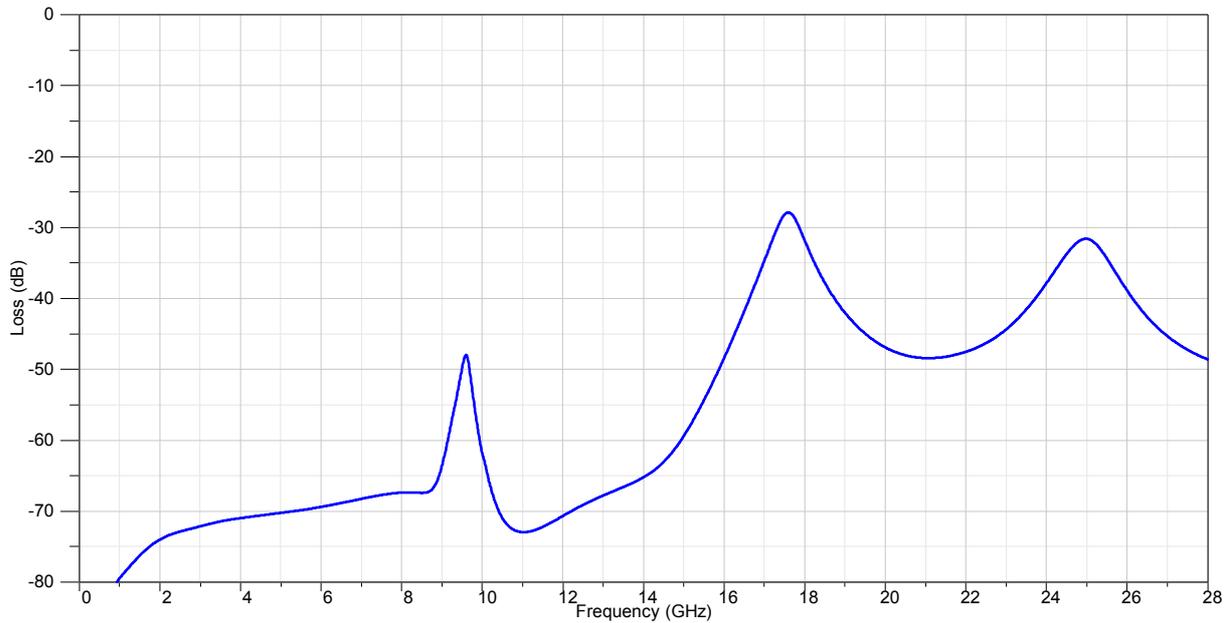
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REFERENCE RESULTS

Near-end Differential Crosstalk



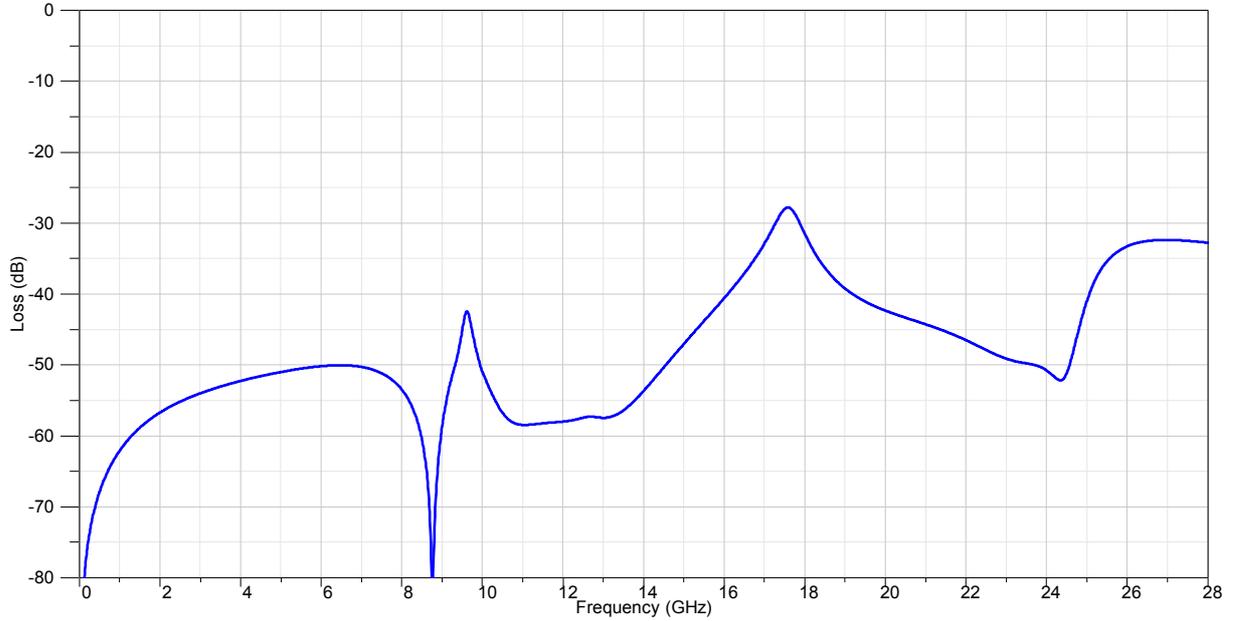
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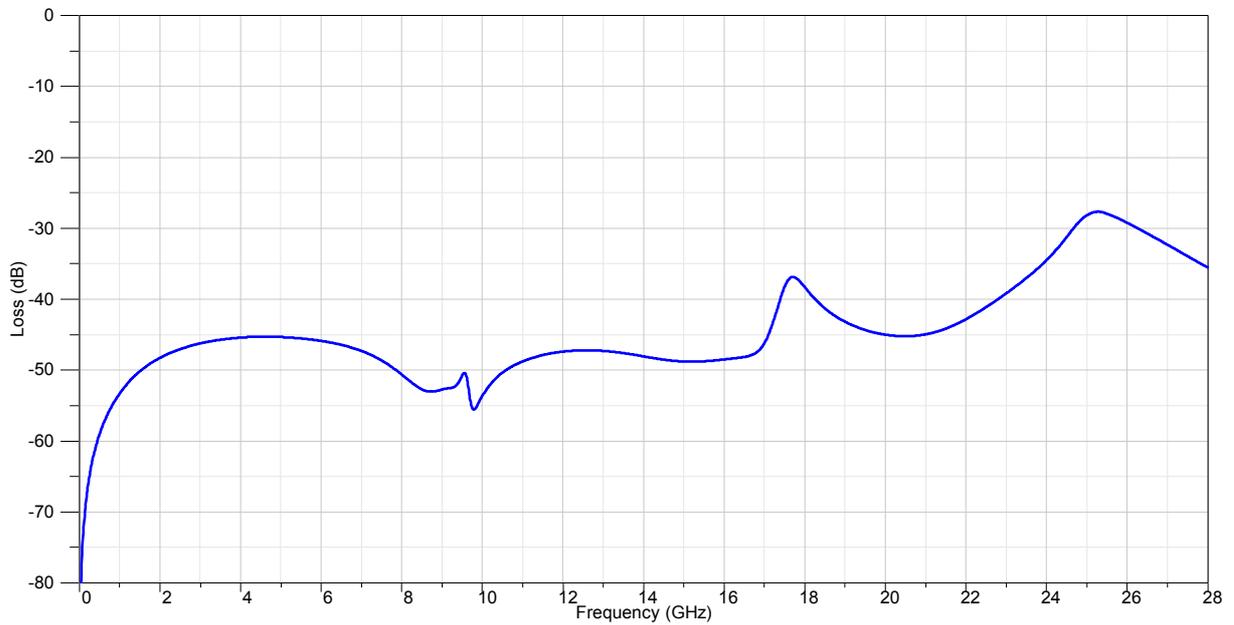
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REFERENCE RESULTS

Mode Conversion - Thru



Mode Conversion - Reflected



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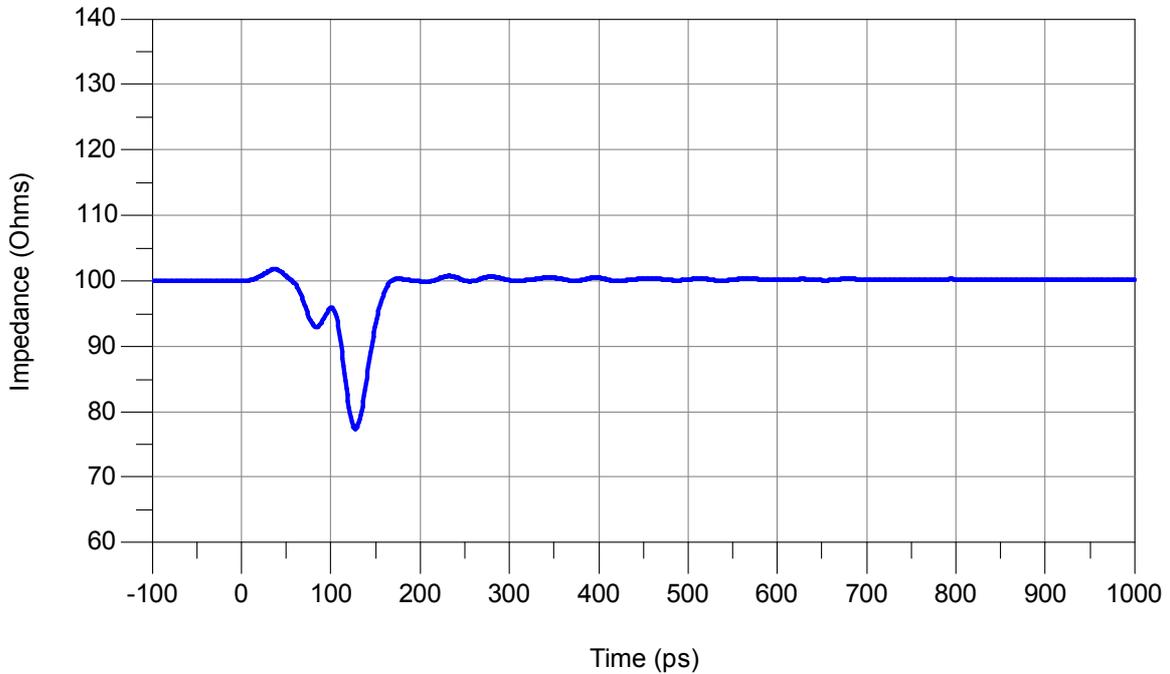


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REFERENCE RESULTS

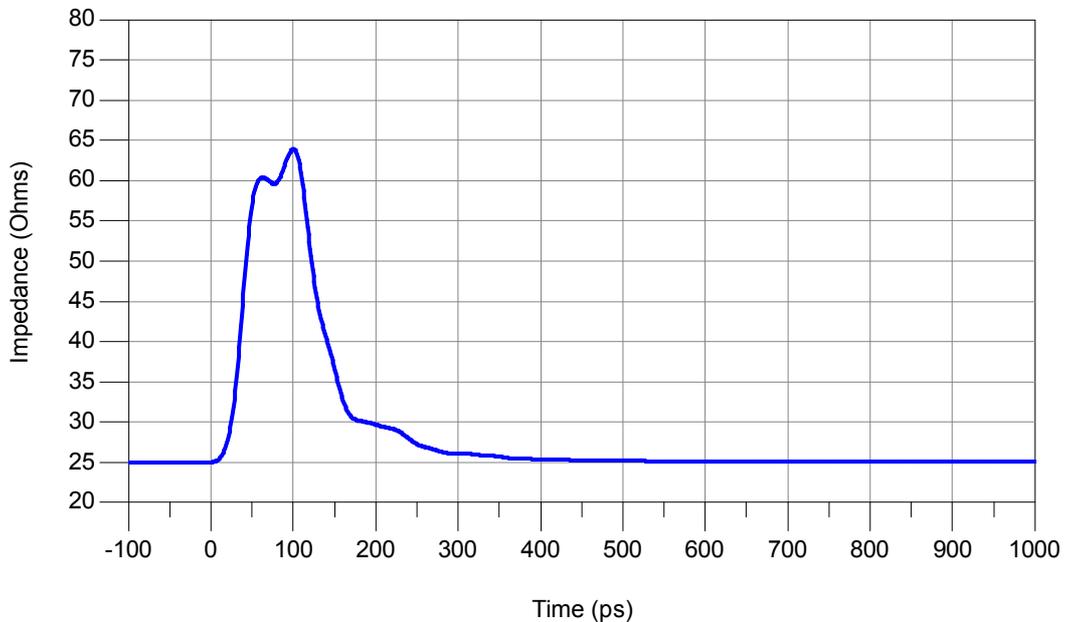
Differential TDR Response

- Rise-time of 18ps (20-80%), representative of 14.025Gbps applications



Common Mode TDR Response

- Rise-time of 18ps (20-80%), representative of 14.025Gbps applications

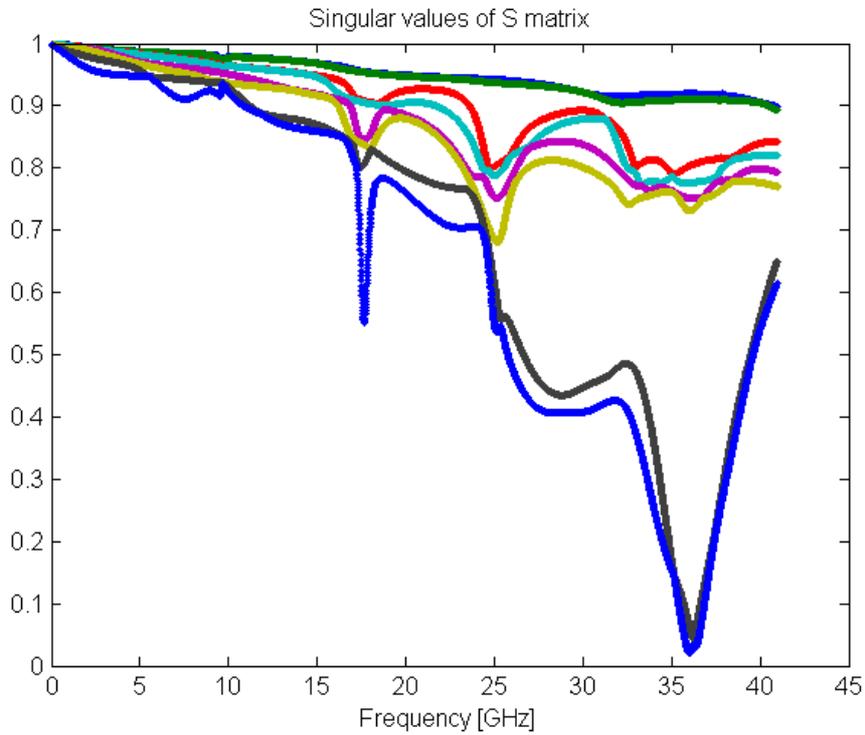


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Model Passivity



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