10 Gigabit Ethernet Consortium
XAUI Electrical Test Suite Version 1.1

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28-Dec-2004

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Mr. Vendor:

Enclosed are the results from the XAUI Physical Layer testing performed on the CompanyCom Fantabulax 3000 XAUI Device. The testing was performed according to Version 1.1 of the XAUI Electrical Test Suite, which may be viewed online at:

http://www.iol.unh.edu/testsuites/10gec/index.html

Note that the tests are based on Clause 47 of IEEE standard 802.3. Table 2 is included to summarize the requirements of this standard and reflect the coverage of the test suite. Results are included in Table 3. Figures 1 through 11 are graphical supplements to the tabulated results.

Note that this report only contains the results for the particular test configuration specified under the "Mask Type" value listed in Table 1 (near-end or far-end). In some cases, a separate report may also be provided that provides the results for the opposite test case, if that testing has been performed. In these cases, it is important to note that Clause 47 only requires that a device meet *either* the near-end *or* far-end conformance values. Thus, failing results observed at one end of the test channel may be considered informative provided *all* of the results for the opposite end are conformant.

Also note that while Clause 47 specifies conformance limits for RX/TX differential return loss, and RX common-mode return loss (SDD11, SDD22, and SCC11, respectively), the Agilent N1951A Physical Layer Test System used by the IOL for performing these tests normally measures the entire mixed-mode s-parameter matrix by default. As a result, measurement results for TX common-mode return loss (SCC22) are included in this report for any informative value they may contain. Also, for each of the return loss results, an additional plot is included showing the return loss data plotted as impedance, again for informative value only.

Note that regardless of the configuration that was used for performing the eye pattern and jitter measurements, all of the s-parameter measurements were made using the near-end configuration. (For DUTs that only provide an Hm-Zd connector rather than a direct SMA breakout, the near end was approximated by performing the measurements across the 1-inch trace of the Tyco reference backplane.)

Also note that prior to running the formal tests, preliminary testing was performed in order to determine the optimal emphasis and/or amplitude settings for the formal test run. The settings used for the formal test, shown in Table 1, were deemed optimal based on the results of these preliminary tests.

Please feel free to contact me at schaller@iol.unh.edu if you have any questions regarding the contents of this report.

Sincerely,

Rob Schaller

Table 1: Setup and Configuration Information

Product	
Manufacturer	CompanyCom
Model	Fantabulax 3000 XAUI Device
Hardware Version	0.01
Firmware Version	Rev A
Software Version	Version 0
Compliance Interconnect	
Test Channel	Tyco Hm-Zd XAUI reference backplane board #2
Trace Length	16 inches
Mask Type	Far end
Test System Hardware	
Real-time DSO	LeCroy SDA6000, S/N SDA00538, Firmware v3.3.0
Vector Network Analyzer	Agilent N1951A 20GHz Physical Layer Test System, S/N US0020201
DUT Configuration	
Test Pattern	CJPAT
Amplitude Setting	0x0F
Emphasis Setting	0x03

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Review Completed 28-Dec-2004

Bob Noseworthy
(Reviewer)

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Table 2: Summary of XAUI Electrical Requirements

Test	**Parameter**	**Min**	**Max**	**Units**
47.1.1	**XAUI Baud**			
	Difference between the mean TX bit rate and 3.125 GBaud	-312.5	312.5	kBd
47.1.2	**Differential Output Amplitude**			
	Maximum Peak-to-Peak Amplitude	0	1600	mV
47.1.3	**Driver Output Swing**			
	Maximum TX+ Amplitude	-400	2300	mV
	Minimum TX+ Amplitude	-400	2300	mV
	Maximum TX- Amplitude	-400	2300	mV
	Minimum TX- Amplitude	-400	2300	mV
47.1.4	**TX Differential Mode Output Impedance**			
	The transmitter output impedance shall result in a differential return loss greater than 10 dB from 312.5 MHz to 625 MHz and greater than $10-10\log_{10}(f/625\text{ MHz})$ dB from 625 MHz to 3.125 GHz (based on a 100-ohm source impedance). The minimum difference between the limit line and the SDD22 curve will be indicated as the Return Loss Margin.	0	Unlimited	dB
47.1.5	**Driver Eye Template**			
	All waveform pixels must fall within mask.	N/A	0	Pixels
47.1.6	**Driver Transmit Jitter (Near End /Far End)**			
	Peak Positive Deterministic Jitter	0	+.085/+.185	UI
	Peak Negative Deterministic Jitter	0	-.085/-.185	UI
	Peak Positive Total Jitter (Pk. Positive $DJ+7\sigma$)	0	+.175/+.275	UI
	Peak Negative Total Jitter (Pk. Negative $DJ-7\sigma$)	0	-.175/-.275	UI
47.2.1	**RX Differential Mode Input Impedance**			
	The receiver input impedance shall result in a differential return loss greater than 10 dB from 100 MHz to 2.5 GHz (based on a 100-ohm source impedance). The minimum difference between the limit line and the SDD11 curve will be indicated as the Return Loss Margin.	0	Unlimited	dB
47.2.2	**RX Common Mode Input Impedance**			
	The receiver input impedance shall result in a common-mode return loss greater than 6 dB from 100 MHz to 2.5 GHz (based on a 25-ohm source impedance). The minimum difference between the limit line and the SCC11 curve will be indicated as the Return Loss Margin.	0	Unlimited	dB

Table 3: Summary of results for the DUT

Test	Parameter	Lane 0	Lane 1	Lane 2	Lane 3	Units
47.1.1	**XAUI Baud**					
	Deviation from 3.125 GBaud	8.38	8.74	8.24	8.33	kBd
47.1.2	**Differential Output Amplitude**					
	Max Pk-Pk Amplitude	993	996	984	981	mV
47.1.3	**Driver Output Swing**					
	Max TX+ Amplitude	235	235	238	243	mV
	Min TX+ Amplitude	-252	-255	-243	-240	mV
	Max TX- Amplitude	252	252	252	249	mV
	Min TX- Amplitude	-255	-255	-252	-249	mV
47.1.4	**TX Diff Mode Impedance**					
	Return Loss Margin	2.4	1.8	2.6	2.5	dB
47.1.5	**Driver Eye Template**					
	Mask Violations	0	0	0	0	Pixels
47.1.6	**Driver Transmit Jitter**					
	Max Positive DJ	0.098	0.106	0.091	0.083	UI
	Max Negative DJ	-0.132	-0.100	-0.118	-0.094	UI
	Max Positive TJ	0.178	0.194	0.174	0.166	UI
	Max Negative TJ	-0.212	-0.189	-0.201	-0.177	UI
47.2.1	**RX Diff Mode Impedance**					
	Return Loss Margin	0.5	0.1	(-0.8)	(-0.0)	dB
47.2.2	**RX Common Mode Impedance**					
	Return Loss Margin	0.4	0.4	(-0.3)	0.1	dB

NOTE: Failures are indicated in red text, enclosed by parentheses

Figure 1: Eye Diagrams

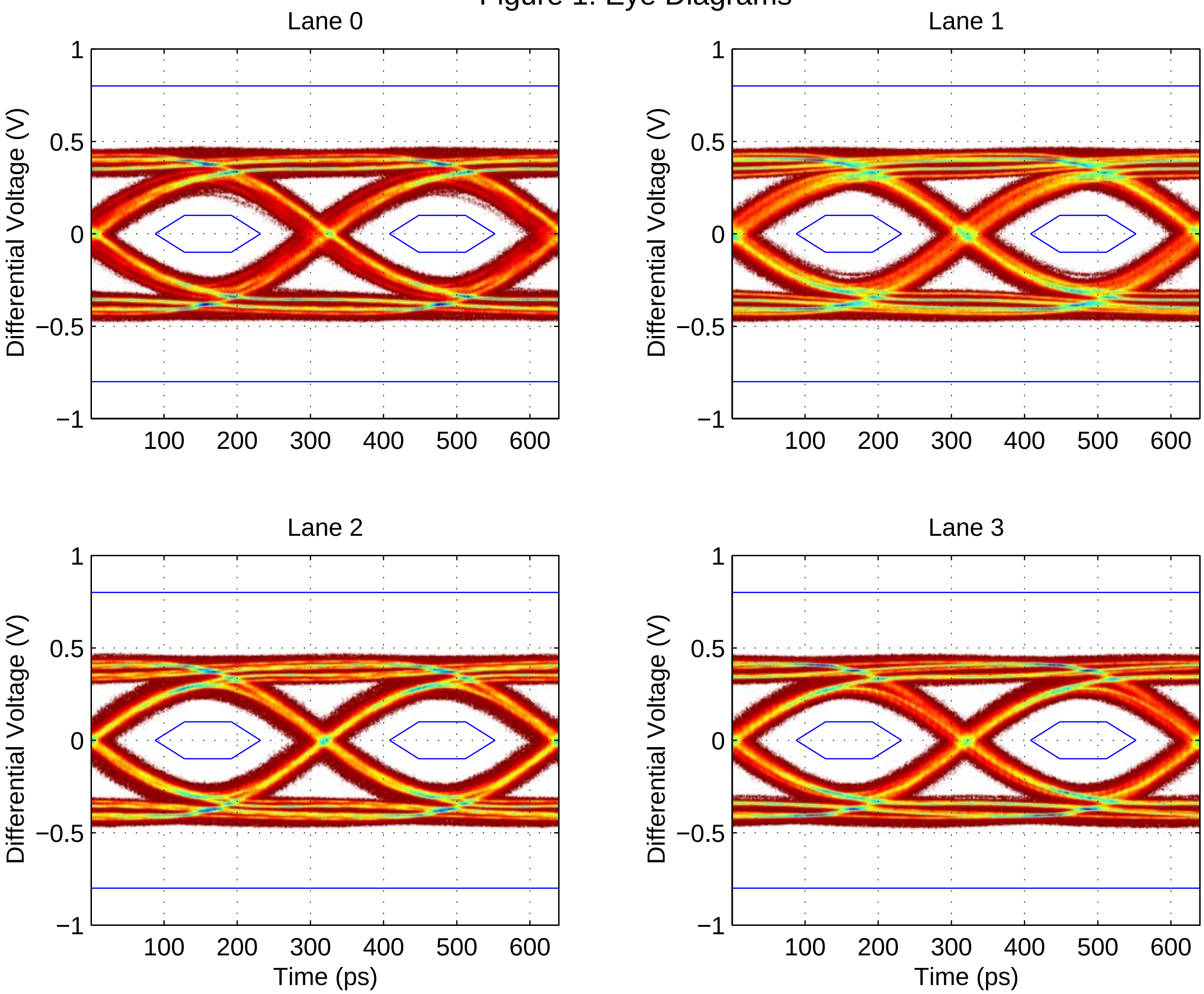

Figure 2: Jitter Histograms (Informative)

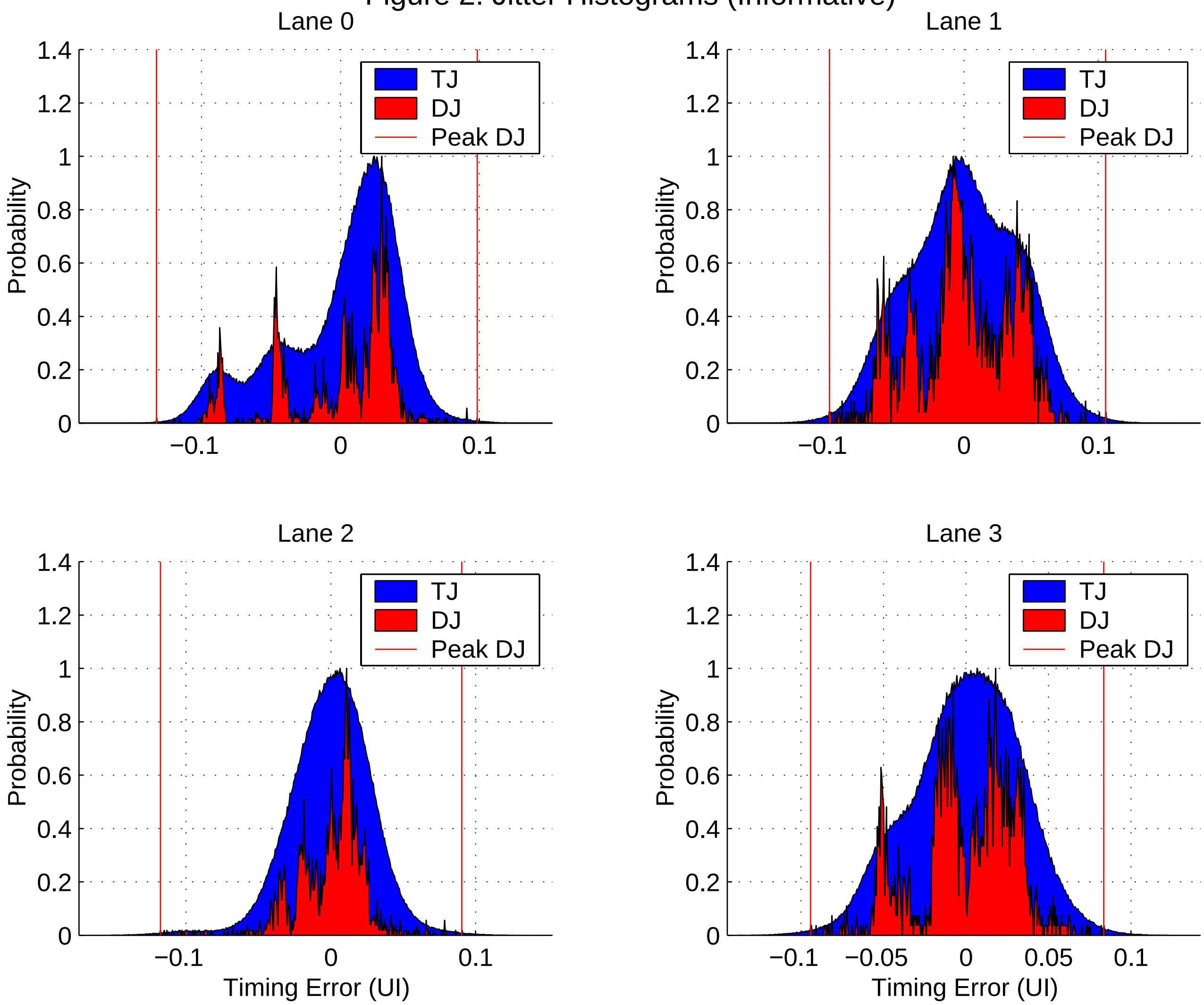

Figure 3: Jitter PSDs (Informative)

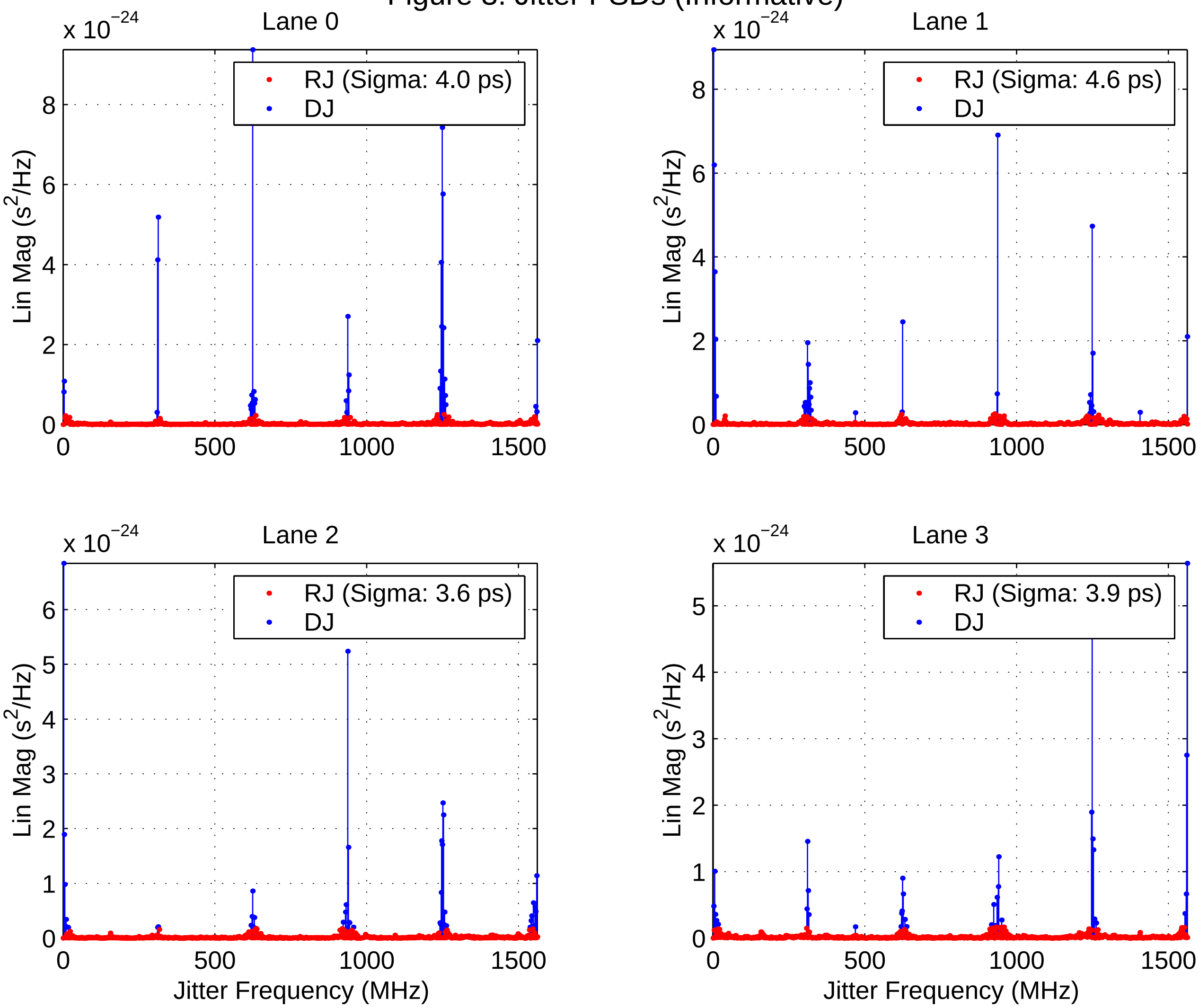

Figure 4: SDD11 (RX Differential Return Loss) vs. Frequency

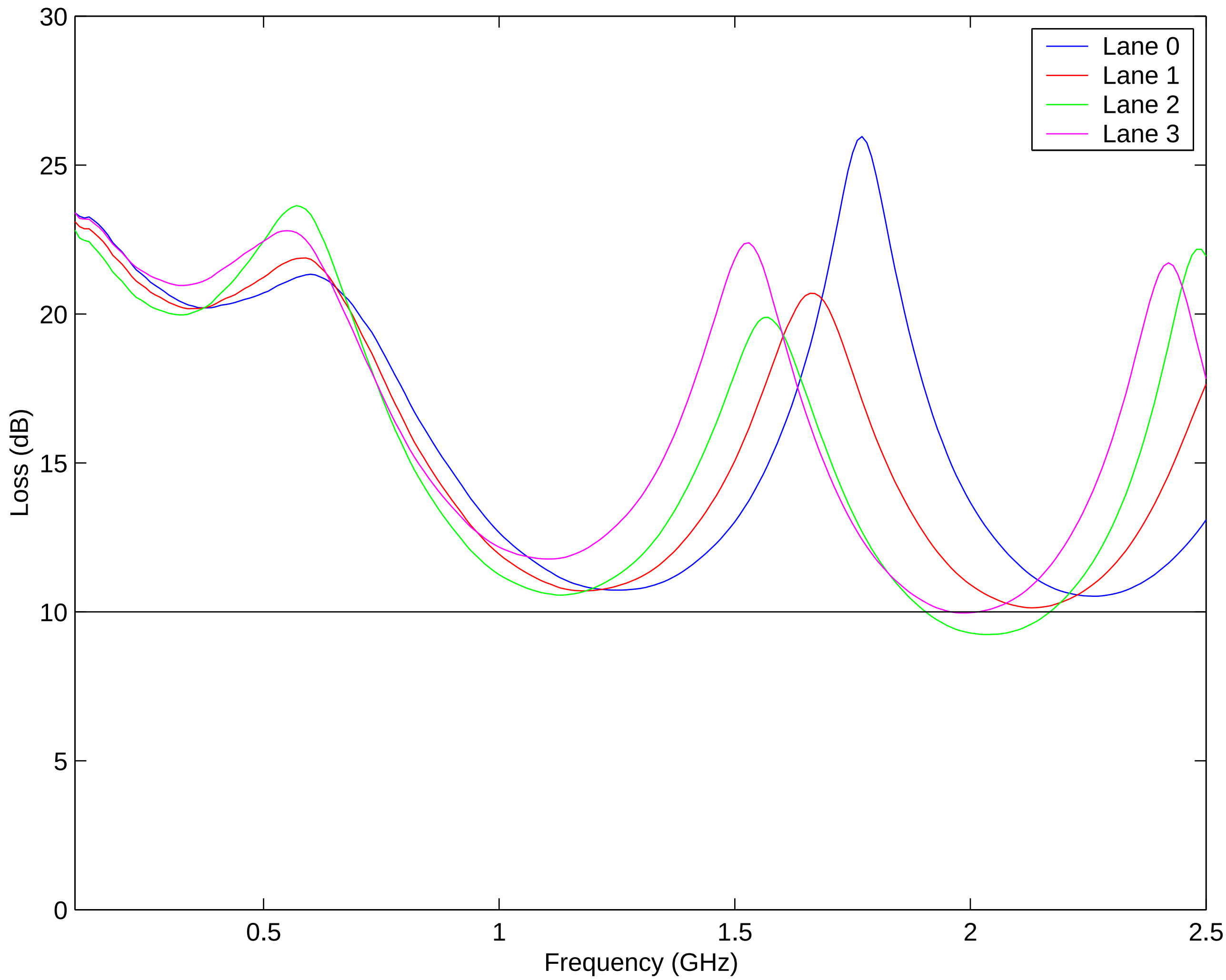

Figure 5: SDD11 (Impedance) vs. Frequency (Informative)

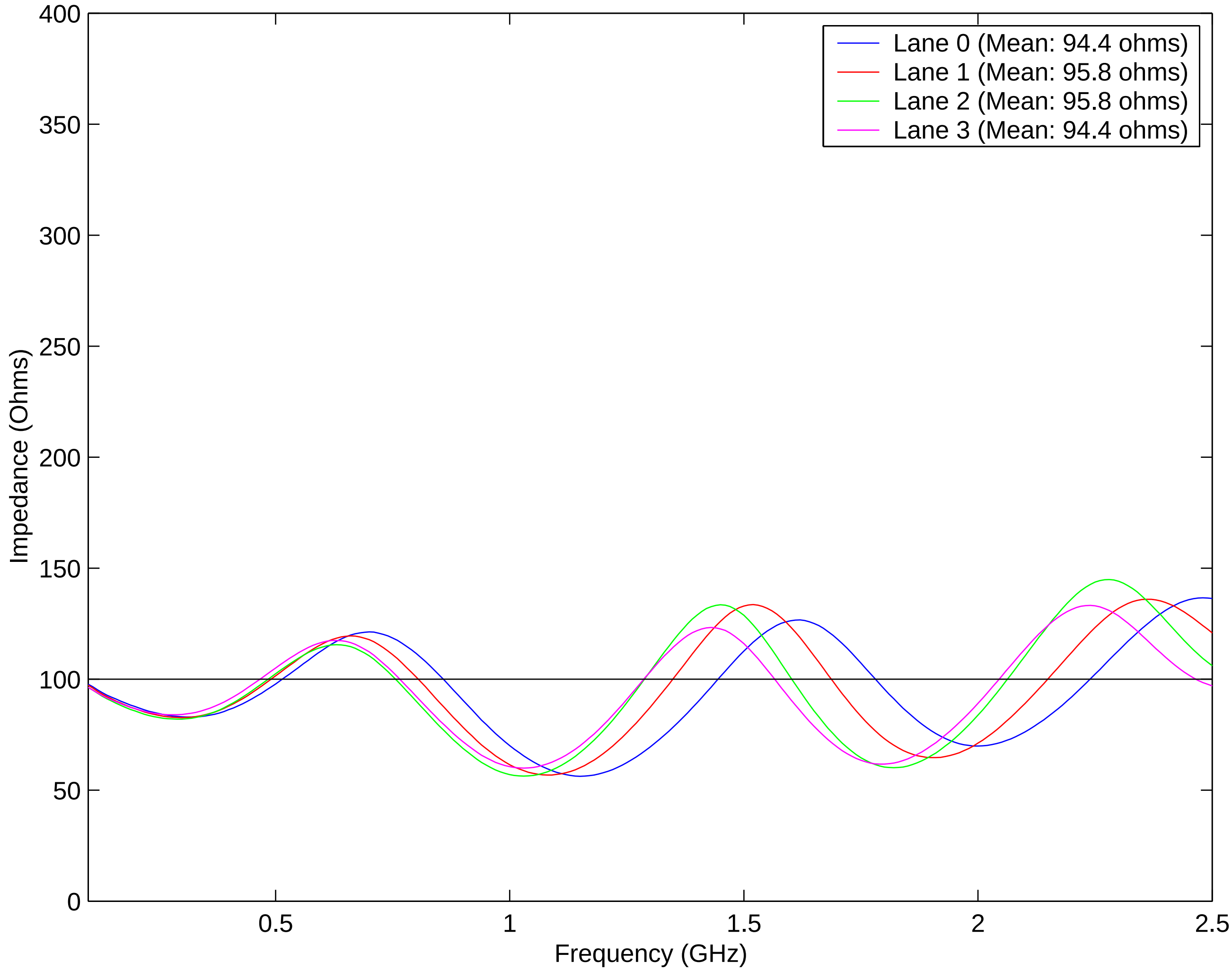

Figure 6: SCC11 (RX Common Mode Return Loss) vs. Frequency

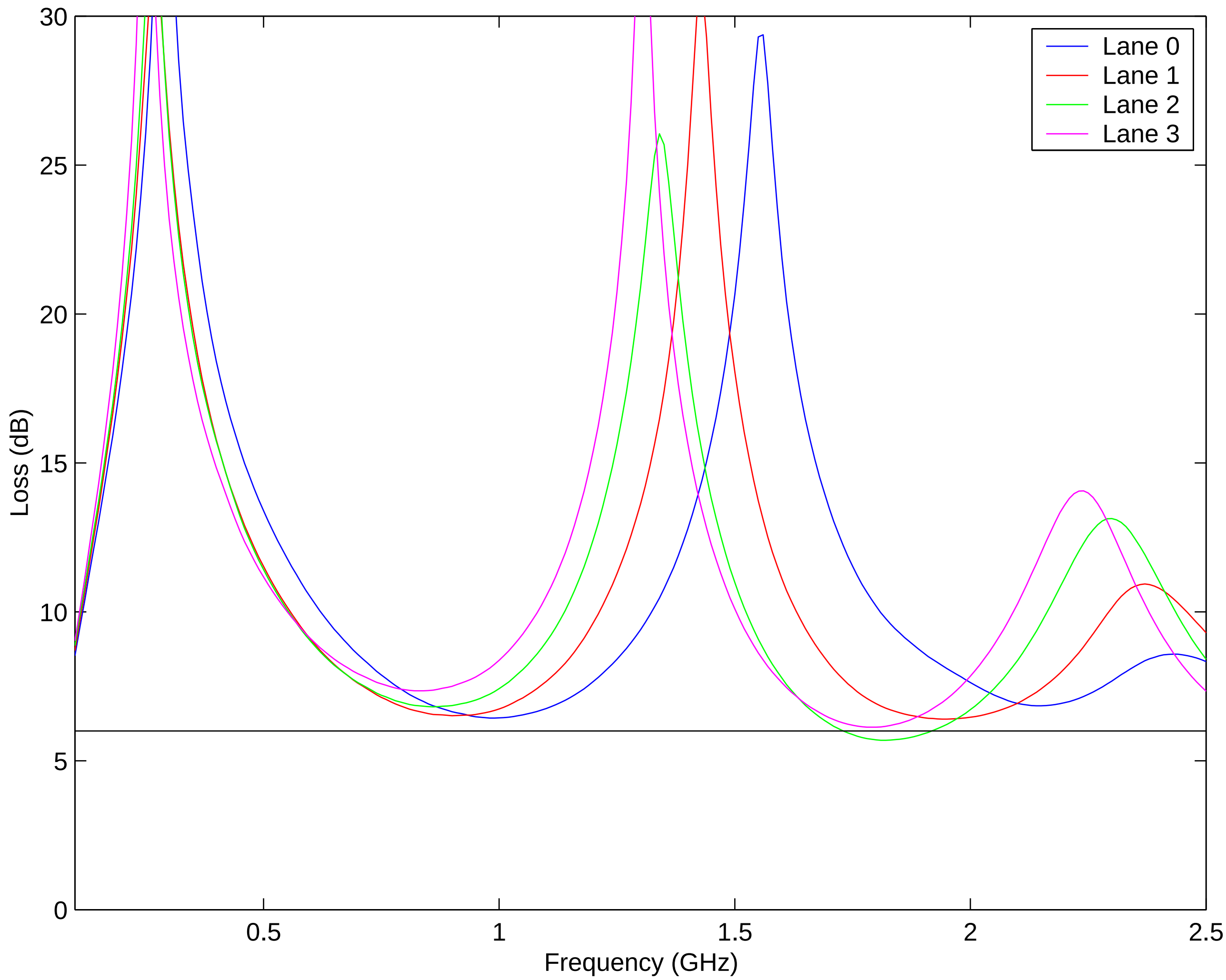

Figure 7: SCC11 (Impedance) vs. Frequency (Informative)

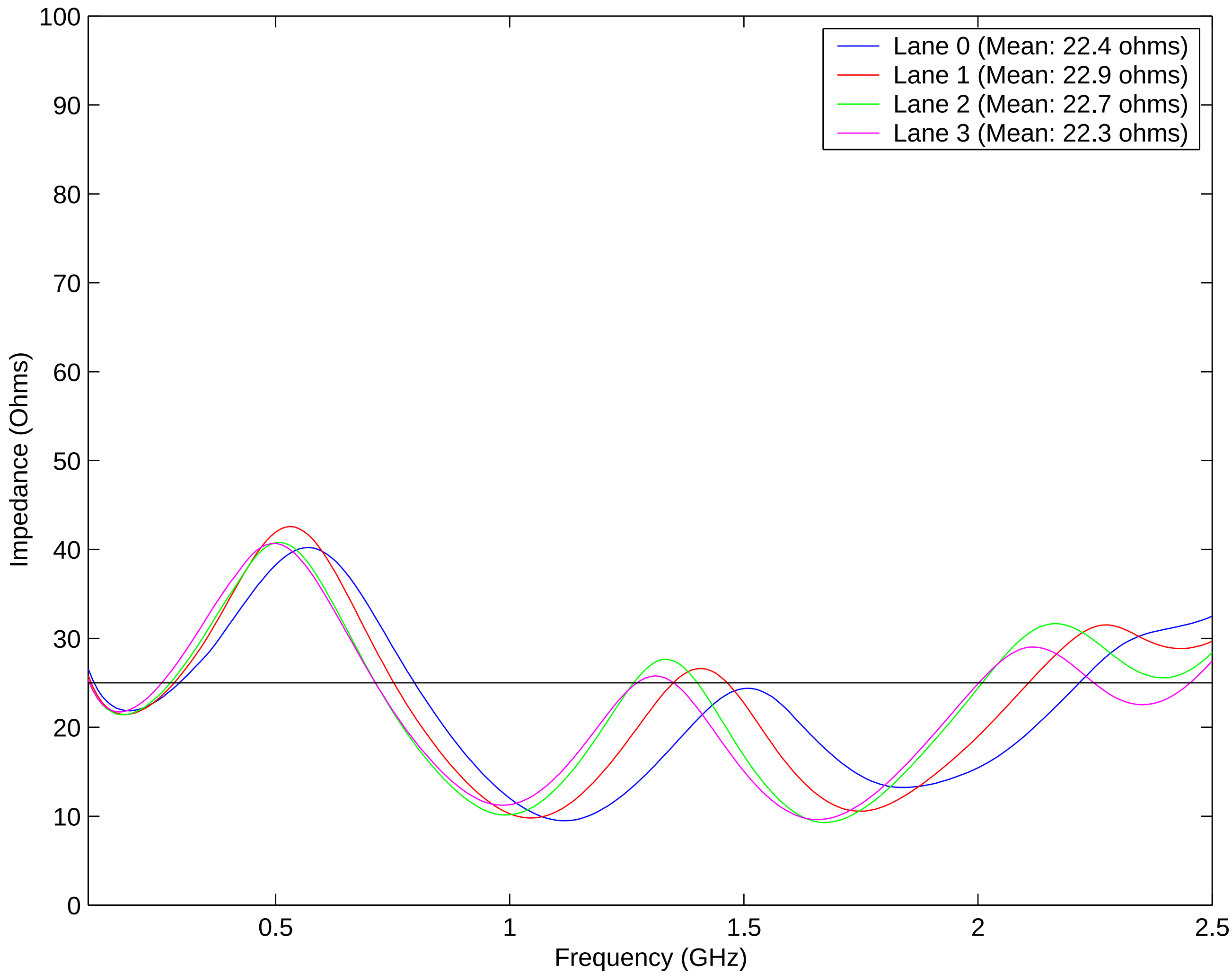

Figure 8: SDD22 (TX Differential Return Loss) vs. Frequency

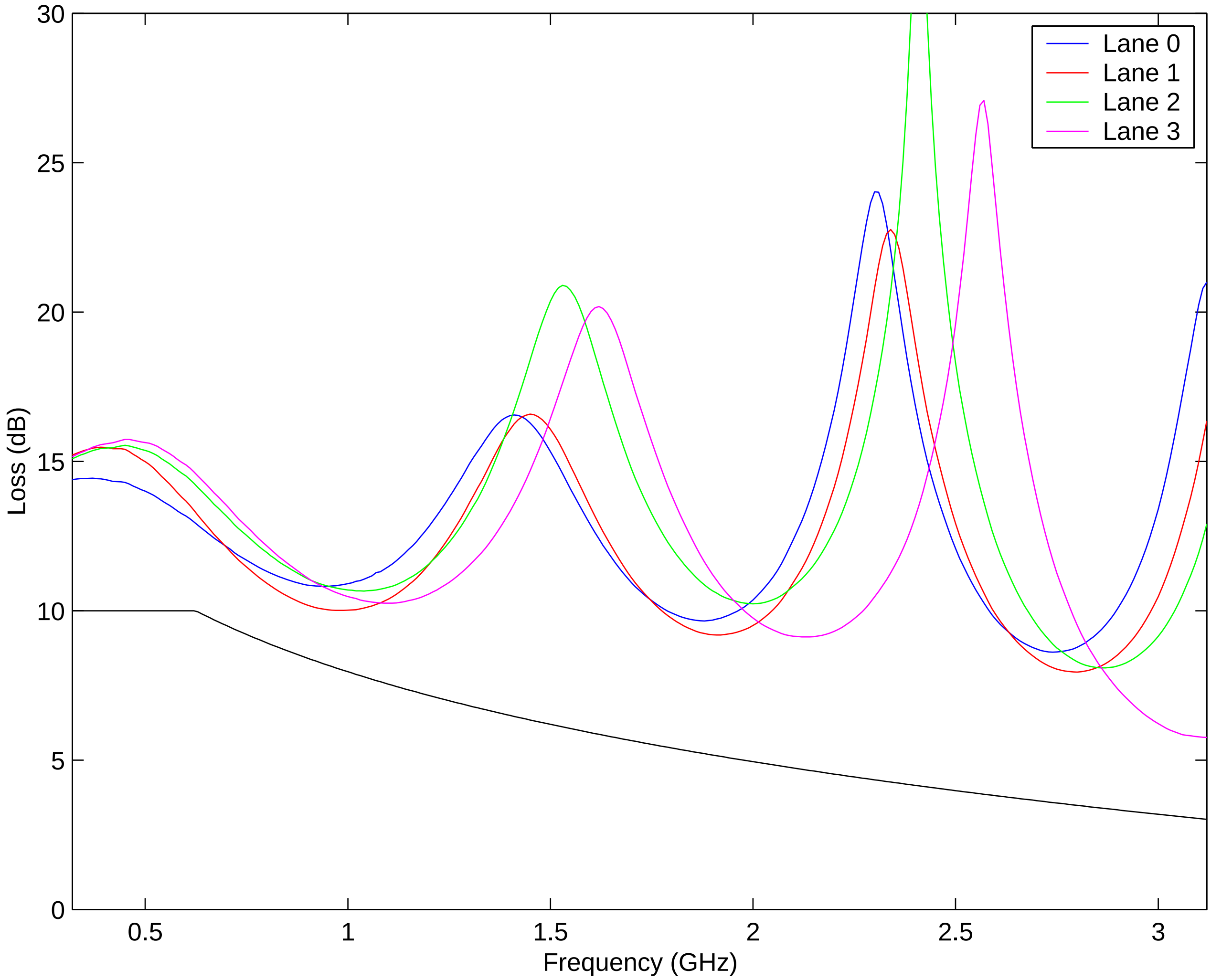

Figure 9: SDD22 (Impedance) vs. Frequency (Informative)

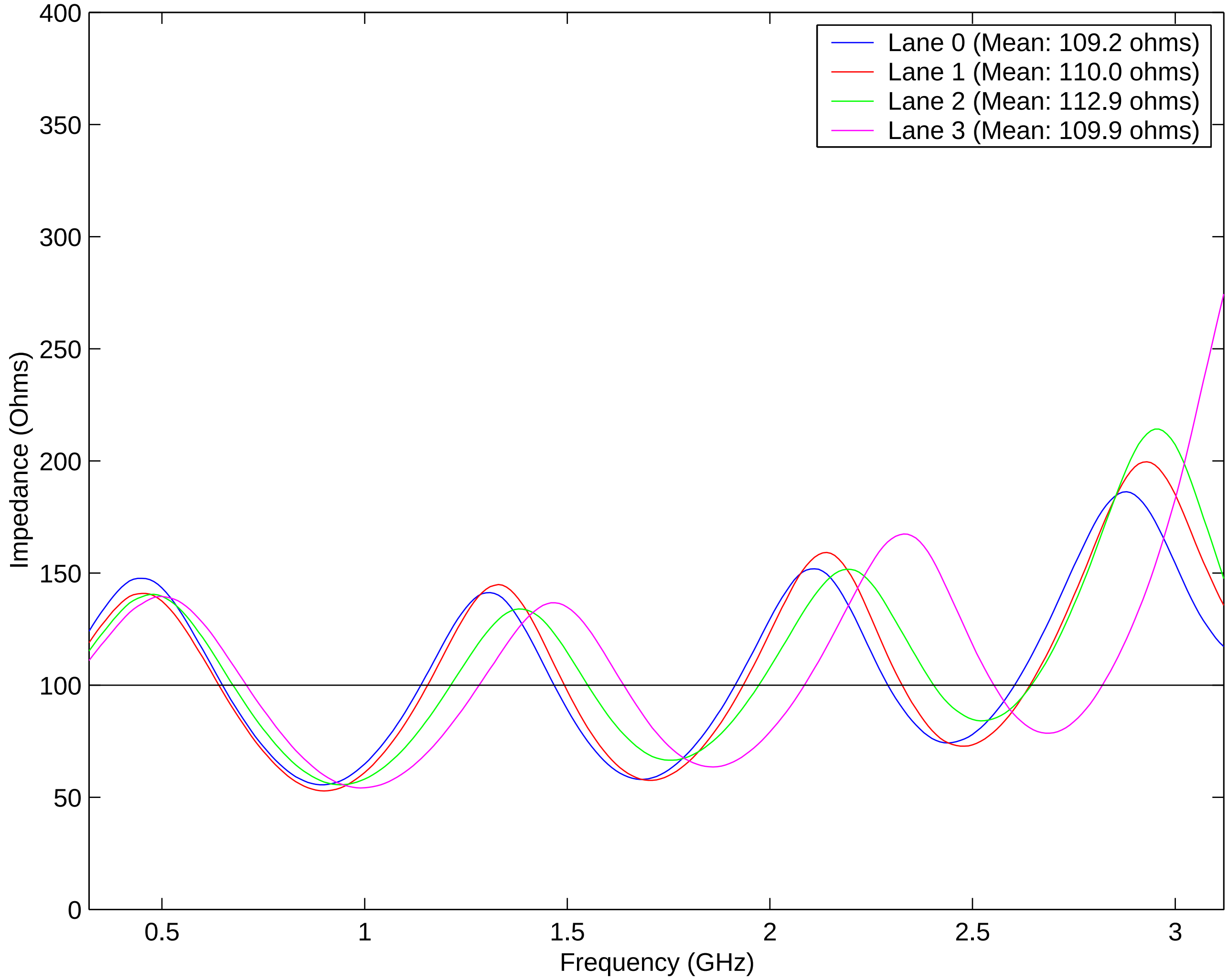

Figure 10: SCC22 (TX Common Mode Return Loss) vs. Frequency (Informative)