10 Gigabit Ethernet Consortium
Clause 55 PMA Conformance Test Suite v1.0 Report

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Contact Name
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Date
Report Rev. 1.0

Enclosed are the results from the Clause 55 PMA Conformance testing performed on:

Device Under Test (DUT):	Sample Report
Hardware Version:	Rev 4
Firmware Version:	1.78
Software Version:	1.00.2.100
Miscellaneous:	Port 0
IOL ID:	IOL-NONE-0000000

The test suite referenced in this report is available at the UNH-IOL website:

ftp://ftp.iol.unh.edu/pub/10gec/testsuites/10GBASE-T_PMA_Electrical_v1.0.pdf

Issues Observed While Testing
55.5.3.2 – Transmitter Linearity – The intermodulation products of test tones 4 exceeded the maximum conformant value.
55.5.3.3 - Transmitter Timing Jitter – The transmit timing jitter exceeded the maximum conformant value on pairs BI_DA and BI_DB
55.5.3.4 – Transmitter Power Spectral Density and Power Level – The PSD exceeded the conformance mask for pair BI_DD

For specific details regarding issues please see the corresponding test result.

Testing Completed: 7/11/2007

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Review Completed: 7/14/2007

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SHA-1 Fingerprint: F007 7D91 2FAA A22C A3D9 F93F 05AC 09DB E219 84B2

Table 1 – Hardware Information

10GBASE-T PHY	
Manufacturer	PHY Manufacturer
Model	PHY Model
Version	PHYVersion
Magnetics	
Manufacturer	MAG Manufacturer
Model	MAG Model
Version	MAG Version
Test System Hardware	
Real-time DSO	LECROY,SDA6000,SDA00538,5.0.4
Spectrum Analyzer	HEWLETT-PACKARD, E4404B
Vector Network Analyzer	HEWLETT-PACKARD,8712B,US34400165,B.03.02
Test System Software	UNH-IOL 10GBASE-T PMA Test System v0.1

Test Setup

All tests in this report were performed using the test setup specified in the 10GBASE-T PMA Test Suite in the Test Setup section of each test.

GROUP 1 – PMA Electrical Specifications

Table 2 – Test Requirements

Test	Title	Min	Max	Units
55.5.3.1 – Maximum Output Droop				
A	Ratio of the voltage 10 ns after the reference zero-crossing to the voltage 90 ns after the reference zero-crossing.	0	10	%
55.5.3.2 – Transmitter Linearity				
A - E	SFDR is the ratio in dB of the minimum RMS value of either input tone to the RMS value of the worst intermodulation product. The Worst Intermodulation Product Margin will be calculated as follows: Margin = (Minimum Input Tone Amplitude – SFDR) – (Worst Intermodulation Product)	0	+Inf.	dB
55.5.3.3 - Transmitter Timing Jitter				
A	Master RMS Period Jitter, pairs A, B, C, D	0	5.5	ps
B	Slave RMS Period Jitter, pair D only.	0	5.5	ps
55.5.3.4 – Transmitter Power Spectral Density and Power Level				
A	Transmitter Power Level	3.2	5.2	dBm
B	Power Spectral Density Mask Fit Margin	0	+Inf.	dB/Hz
55.5.3.5 – Transmit Clock Frequency				
A	Mean clock frequency minus 800MHz	-40.0	40.0	kHz
55.8.3.1 – MDI Return Loss				
A	The return loss of the MDI shall be at least 16 dB from 1 to 40 MHz and at least $16 - 10 \log_{10}(f / 40\ MHz)$ dB from 40 to 400 MHz and at least $6 - 30*\log_{10}(f/400)$ from 400 to 500 MHz for all differential signals incident upon the MDI from an 85 or 115 Ω source. The minimum difference between the limit line and the return loss curve will be indicated as the Return Loss Margin.	0	+Inf.	dB

Table 3 – Summary of results

Test	Parameter	Min	Max	BI_DA	BI_DB	BI_DC	BI_DD	Units	Figure
55.5.3.1 – Maximum Output Droop									
A	Averaged Maximum Droop	0	10	2.72	3.02	2.79	2.87	%	1
55.5.3.2 – Transmitter Linearity									
A	Test Tones 1: Worst Intermodulation Product Margin	0	+Inf.	2.87	3.78	3.41	2.98	dB	2
B	Test Tones 2: Worst Intermodulation Product Margin	0	+Inf.	4.12	4.42	4.23	4.44	dB	3
C	Test Tones 4: Worst Intermodulation Product Margin	0	+Inf.	(-0.74)	(-0.97)	(-0.45)	(-0.23)	dB	4
D	Test Tones 5: Worst Intermodulation Product Margin	0	+Inf.	6.24	6.82	7.08	6.87	dB	5
E	Test Tones 6: Worst Intermodulation Product Margin	0	+Inf.	6.74	6.23	5.52	6.11	dB	6
55.5.3.3 – Transmitter Timing Jitter									
A	MASTER RMS Period Jitter	0	5.5	(5.87)	(5.72)	5.07	5.13	ps	7
B	SLAVE RMS Period Jitter	0	5.5				(5.61)	ps	8
55.5.3.4 – Transmitter Power Spectral Density and Power Level									
A	Transmiter Power Level	3.2	5.2	4.01	4.08	3.94	4.57	dBm	
B	PSD Mask Fit Margin	0	+Inf.	0.67	0.22	0.73	(-0.14)	dB/Hz	9
55.5.3.5 – Transmit Clock Frequency									
A	Clock deviation	-40.0	+40.0	7.24	7.23	7.27	7.21	kHz	
55.8.3.1 – MDI Return Loss									
A	Return Loss margin	0	+Inf.	1.12	2.00	1.78	1.64	dB	10

Annex A – Supplemental figures

Figure 1: Maximum Output Droop

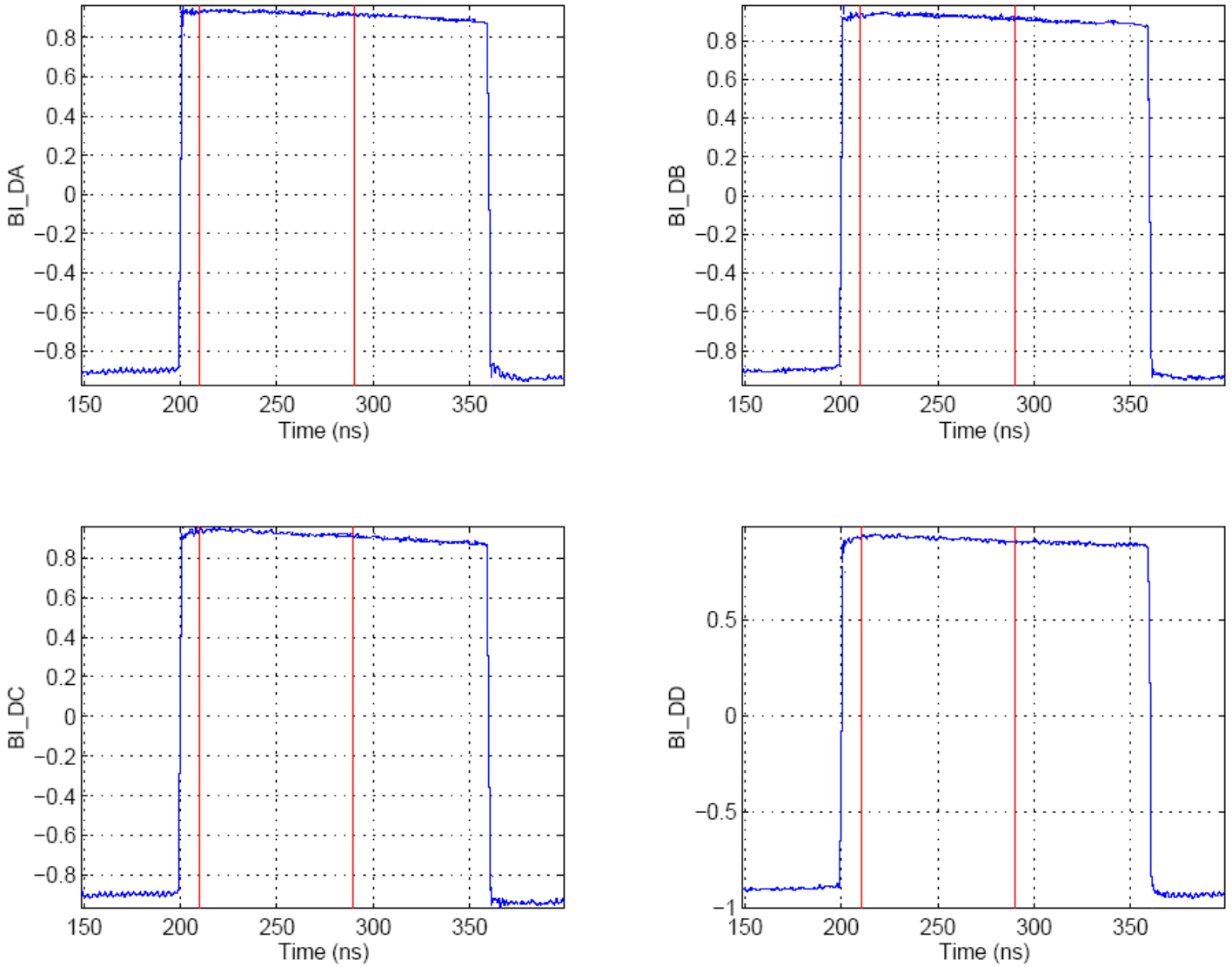


Figure 2: Linearity, Tone Pair #1

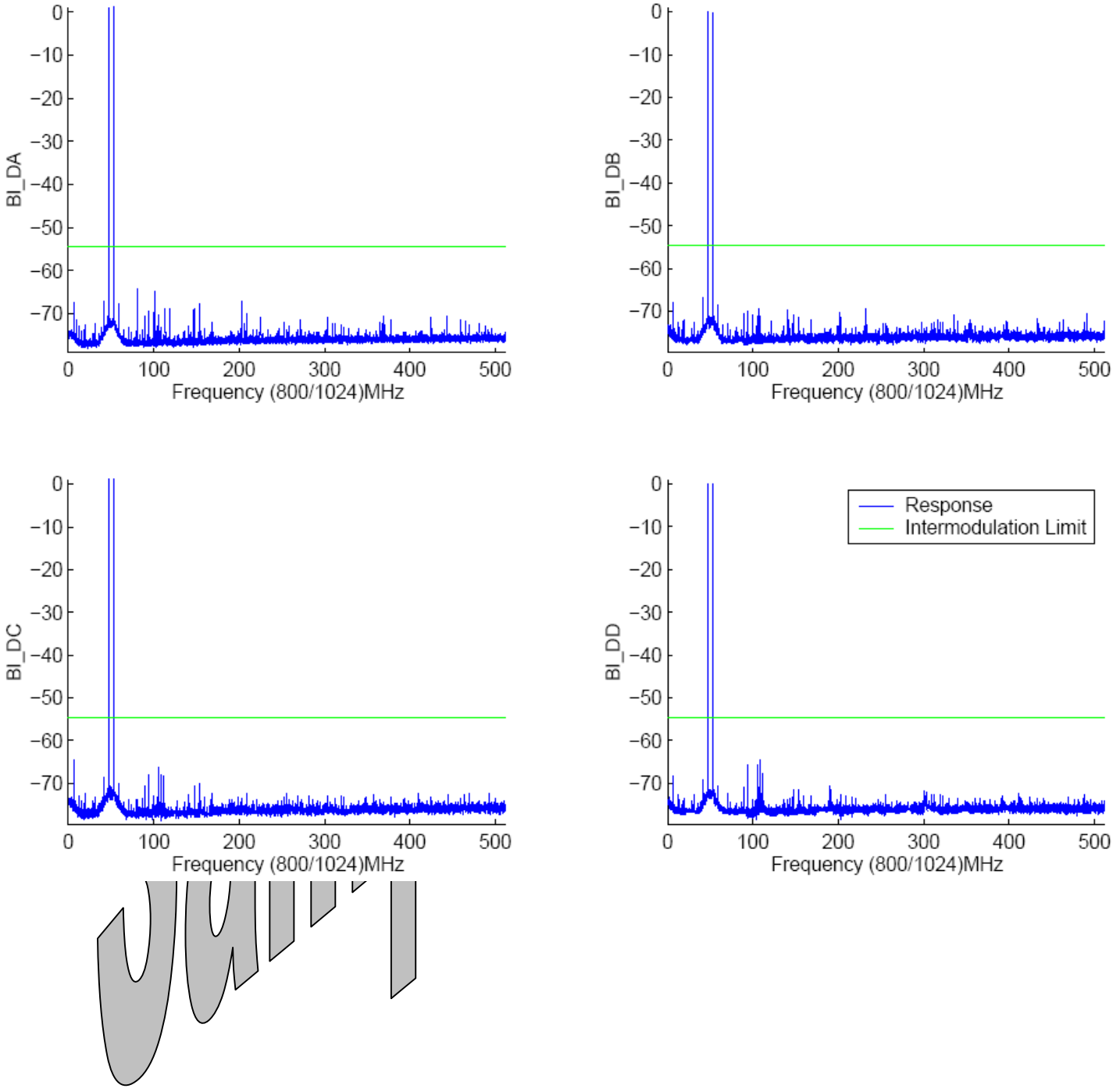


Figure 3: Linearity, Tone Pair #2

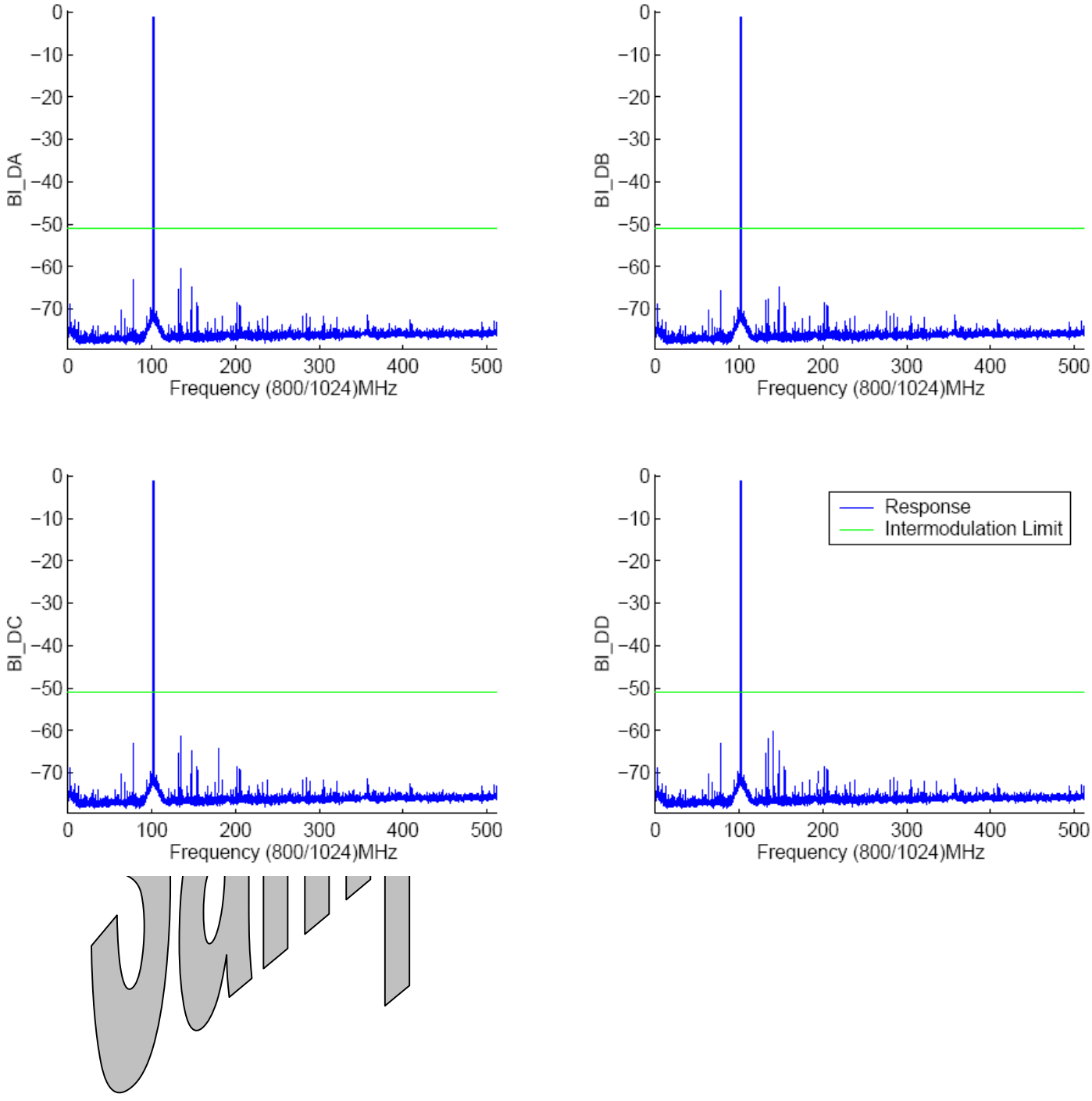
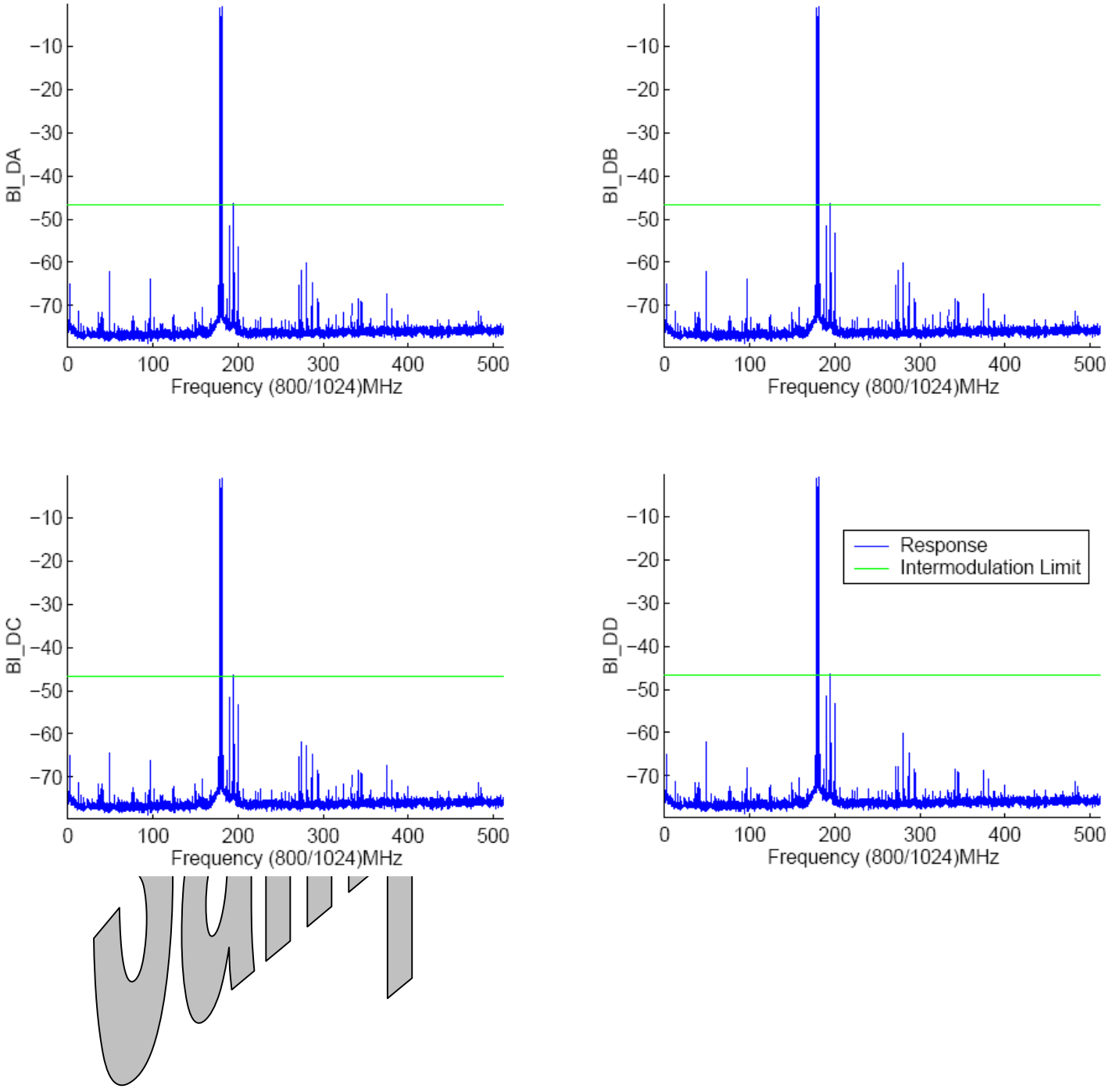


Figure 4: Linearity, Tone Pair #4




Sample Report

Figure 6: Linearity, Tone Pair #6

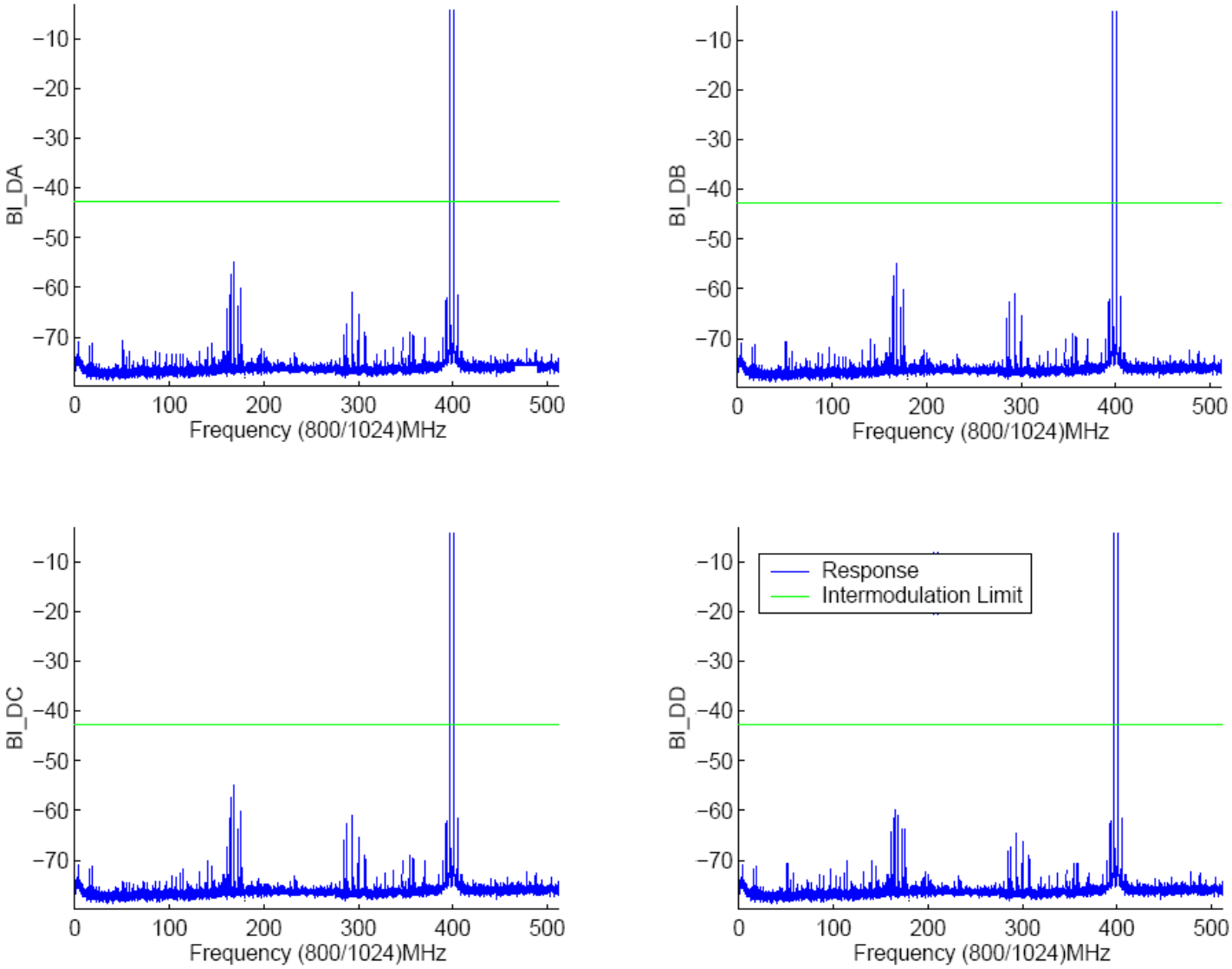


Figure 7: Master Jitter

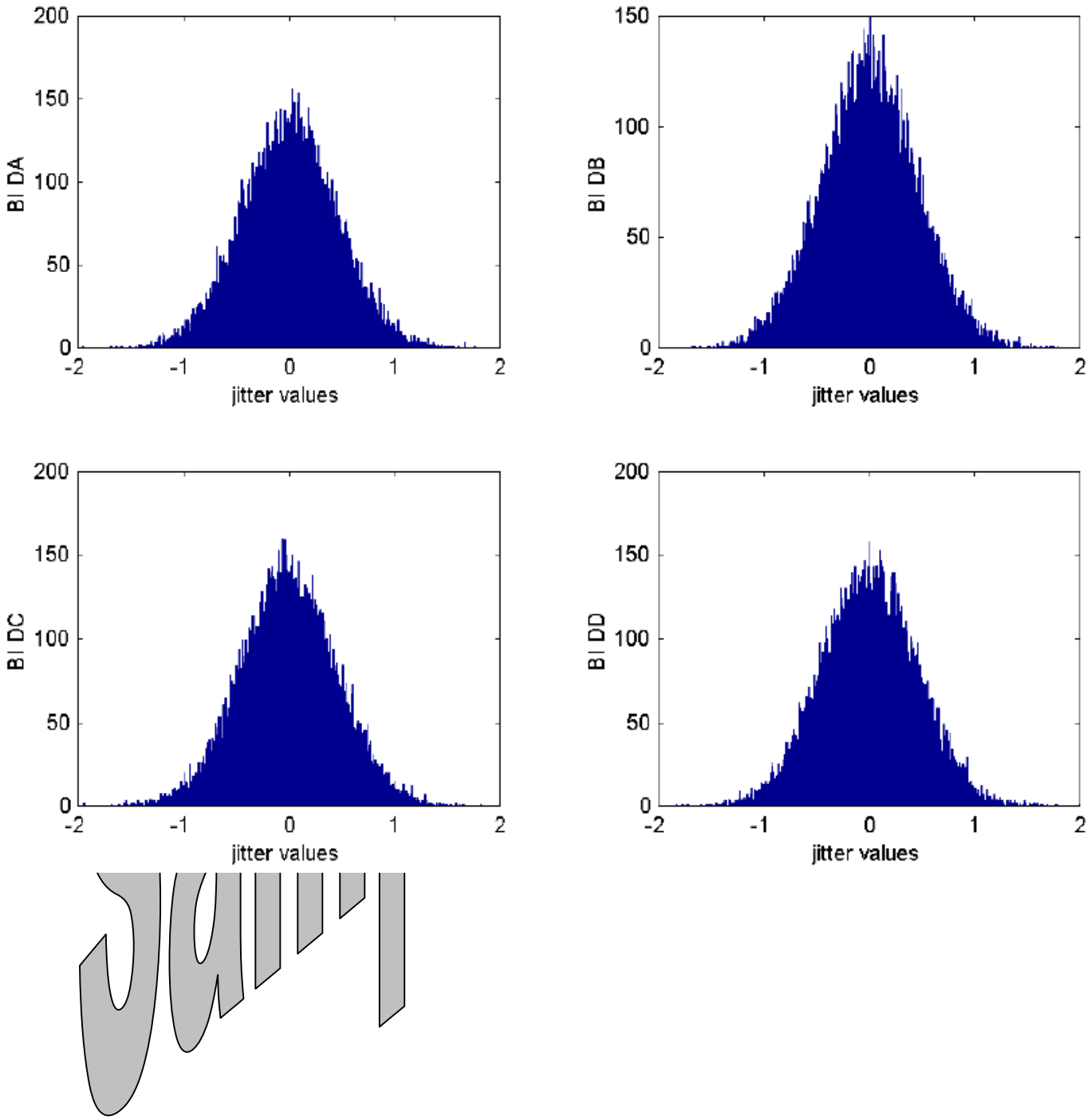


Figure 8: Slave Jitter

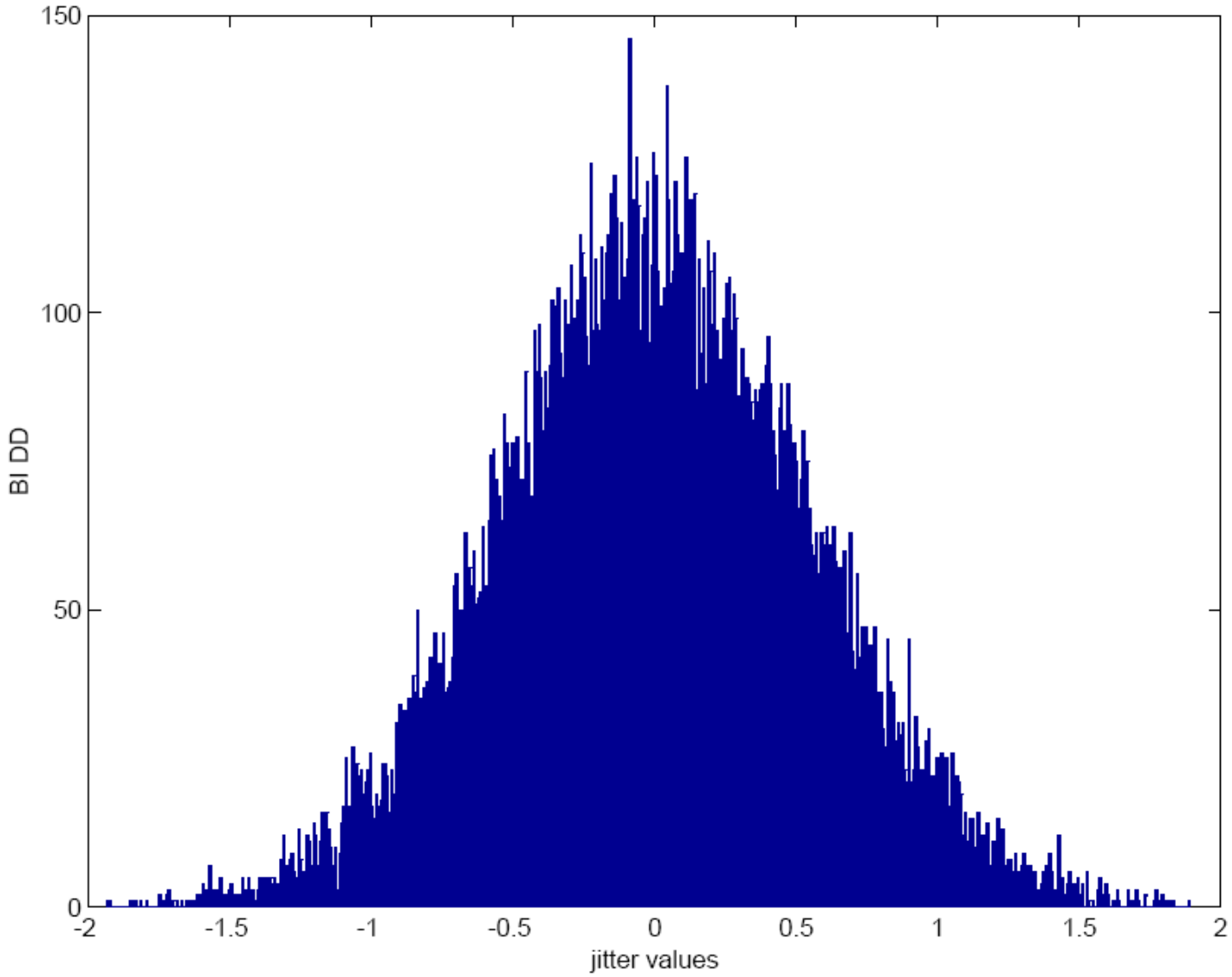


Figure 9: Power Spectral Density

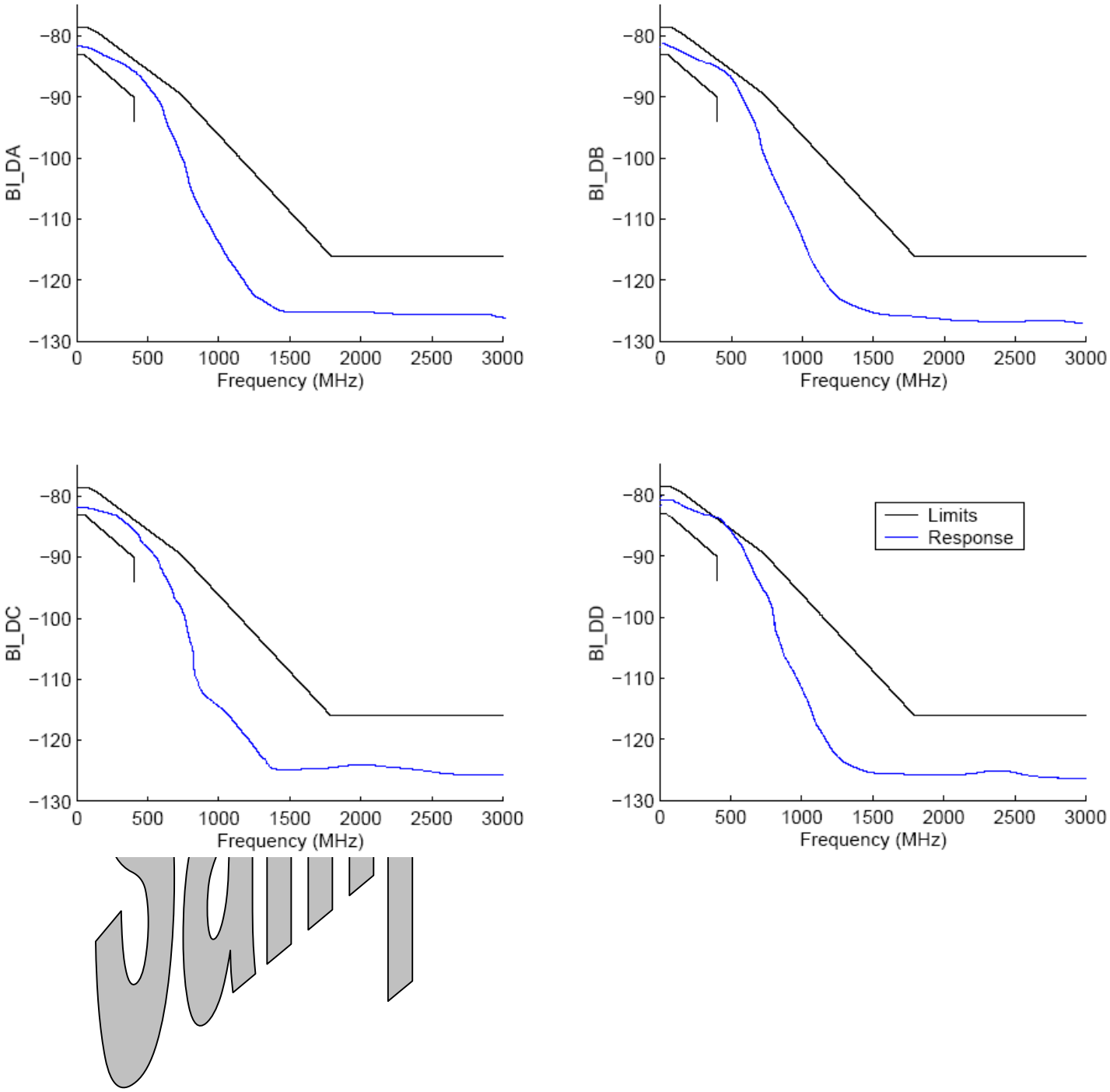


Figure 10: Return loss vs. frequency