Power over Ethernet Consortium
Interoperability Test Suite v2.2 Report

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Report Rev. 1.0

Enclosed are the results from the Clause # 33 PSE Conformance testing performed on:

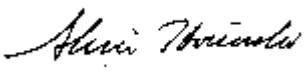
Device Under Test (DUT):	LTC4267EDHC Demo Circuit 804A
Port Tested:	Port 1
Hardware Version:	Not Available
Software Version:	Not Applicable
PD Chipset:	LTC4267EDHC

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

ftp://ftp.iol.unh.edu/pub/ethernet/test_suites/interop/Interop_Test_Suite_v2.2.pdf

There were no issues uncovered during interoperability testing.

Testing Completed
09/26/2005



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Result Key

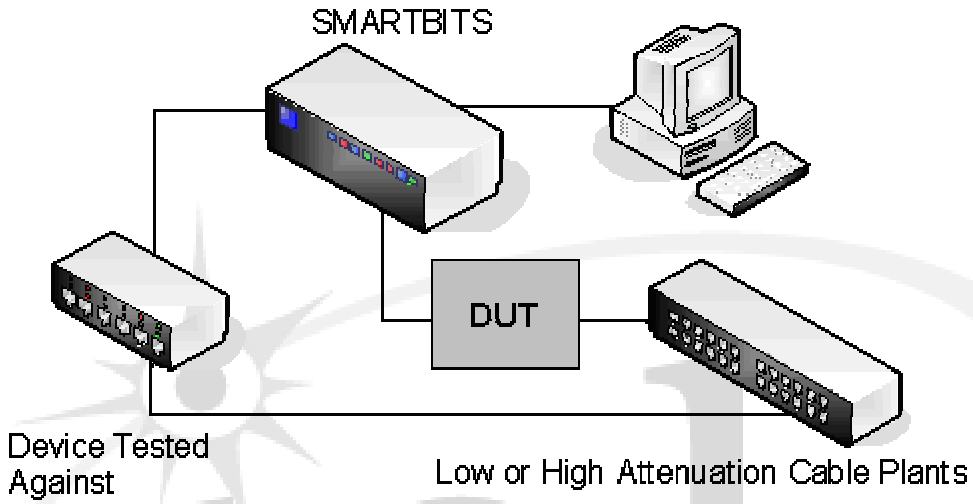
The following table contains possible results and their meanings:

Result	Interpretation
PASS	The Device Under Test (DUT) was observed to exhibit conformant behavior.
PASS with Comments	The DUT was observed to exhibit conformant behavior however an additional explanation of the situation is included, such as due to time limitations only a portion of the testing was performed.
FAIL	The DUT was observed to exhibit non-conformant behavior.
Warning	The DUT was observed to exhibit behavior that is not recommended.
Informative	Results are for informative purposes only and are not judged on a pass of fail basis.
Refer to Comments	From the observations, a valid pass or fail could not be determined. An additional explanation of the situation is included.
Not Applicable	The DUT does not support the technology required to perform these tests.
Not Available	Due to testing station or time limitations, the tests could not be performed.
Borderline	The observed values of the specified parameters are valid at one extreme, and invalid at the other.
Not Tested	Not tested due to the time constraints of the test period.

Test Setup

Testing Equipment	
Spirent Smartbits 2000	Used to Source Packet Traffic

Testing Configuration:



Test #1.1.1 Link Speed Detection
Case 1: This test entails power cycling the DUT while the Link Partner is left on and connected. Once the DUT has booted up, a link should be established between the two devices and traffic should be able to be transmitted between them. Refer to the following tables for further information regarding the results of this test.

Case 2: This test mimics Case 1 except that the Link Partner is power cycled rather than the DUT. This test does not apply because the Powered Device cannot be powered without the Power Sourcing Equipment.

Case 3: This test entails powering on the DUT and the link partner separately and then connecting them together once they have booted up and have been configured such that each device is auto-negotiating. Traffic is then sent from one of the two devices and checked at the other end for correct reception. This test does not apply because the Powered Device cannot be powered separately from the Power Sourcing Equipment.

Case 4: This test entails power cycling the DUT while the link partner is connected. Once the DUT has booted up, a link should be established between the two devices and traffic should be able to be transmitted between them. Refer to the following tables for further information regarding the results of this test

Test #1.1.3 Packet Error Ratio Estimation
High Attenuation Channel: The two devices are connected to each end of the channel with a 5-meter cable. The high attenuation channel is 125 meters long. A number of ICMP echo requests (Refer to the Ethernet Physical Layer Interoperability Test Suite: Appendix A Table A-1) are sent to verify that traffic can successfully be sent between the link partners. The number of packets lost is noted. Refer to the following tables for further information regarding the results of this test.

Low Attenuation Channel: The two devices are connected to each end of the channel with a short 5-meter cable. The low attenuation channel is 10 meters long. A number of ICMP echo requests (Refer to the Ethernet Physical Layer Interoperability Test Suite: Appendix A Table A-1) are sent to verify that traffic can successfully be sent between the link partners. The number of packets lost is noted. Refer to the following tables for further information regarding the test results.

Test #1.1.4 Endurance Stress Test
This test is designed to verify that no obvious buffer management problems occur when directing a large volume of traffic with minimum IPG at the DUT. This test is informative only and is designed to verify that the DUT has no obvious buffer management problems. The DUT is attached to a sourcing station that is capable of sending an appropriate number of 64-byte ICMP echo requests with a minimum IPG of 96BT (Refer to the Ethernet Physical Layer Interoperability Test Suite Table 1-6). The DUT does not have to respond to all of the requests but the test should not cause any system failures. Refer to the following tables for further information regarding the results of this test.

Test #1.1.7 Power Request and Application
These Cases are designed specifically for devices that only support power.

Case 1: This test entails powering on the DUT separately and then connecting the link partner. The Power Sourcing Equipment should be able to provide power to the Powered Device. Refer to the following tables for further information regarding the results from this test.

Case 2: This test entails power cycling the Power Sourcing Equipment while the Powered Device is connected. The Power Sourcing Equipment should provide power to the Powered Device. Refer to the following tables for further information regarding the results from this test.

Channel Plots

Included with this report is a series of plots that provide a characterization of the channels over which the testing was performed. The plots include the following items.

- Attenuation plots taken for each channel.
- Near end cross talk (NEXT) plots taken from both ends of each channel (Both the DUT and the testing station). The DUT end is labeled as “Near End Crosstalk" and the testing station end is labeled as “Near End Crosstalk @ Remote”.
- Return Loss plots taken for each channel, at the DUT and at the testing station. The DUT is labeled as “Return Loss” and the testing station end is labeled as “Return Loss @ Remote”.

Test Matrix

The matrices are divided into sections according to the type of device being tested against. The first matrix contains four columns:

- The manufacturer and name of the device being tested against.
- Results of link speed detection testing.
- Results of the packet error ratio test over a high attenuation Category-5 compliant channel at 60°.
- Results of the packet error ratio test over a low attenuation Category-5 compliant channel at 60°.

Test Results:

PSE Tested	Test # 1.1.1 Link Speed Detection		Test # 1.1.3 High Attenuation Channel		Test # 1.1.3 Low Attenuation Channel	
	Case 2	Case 4	64 Byte	1518 Byte	64 Byte	1518 Byte
3Com 4400 PSE Switch	PASS	PASS	0	0	0	0
3Com NetJack 220	PASS	PASS	0	0	0	0
3Com NetJack 200 New	PASS	PASS	0	0	0	0
3Com NetJack 200 Old	PASS	PASS	0	0	0	0
3Com NetJack 105	PASS	PASS	0	0	0	0
Alcatel Omniswitch 7700-P24	PASS	PASS	0	0	0	0
Avaya P333T-PWR	PASS	PASS	0	0	0	0
Broadcom StrataXGS2 24 port Switch	PASS	PASS	0	0	0	0
Broadcom StrataXGS3 48 port Switch	PASS	PASS	0	0	0	0
Cisco Veo2-WS-X4248-RJ45V	PASS	PASS	0	0	0	0
Cisco Inferno-WS-X4548-GB-RJ45V	PASS	PASS	0	0	0	0
Dell PowerConnect 3424P	PASS	PASS	0	0	0	0
HP Procurve J8161A	PASS	PASS	0	0	0	0
HP Procurve 2650 PWR	PASS	PASS	0	0	0	0
Linear Tech LTC4259 Autonomous Mode	PASS	PASS	0	0	0	0
Linear Tech LTC4259 RS232 Software Controlled	PASS	PASS	0	0	0	0
Matsushita Switch-M12PWR	PASS	PASS	0	0	0	0
Matsushita Switch-S12PWR	PASS	PASS	0	0	0	0
Micrel DPA v0.2 Midspan PSE	PASS	PASS	0	0	0	0
Nortel Networks Baystack 460-24T PWR Switch	PASS	PASS	0	0	0	0
Nortel Networks Baystack 470-24T PWR Switch	PASS	PASS	0	0	0	0
Panduit DPoE24U1X	PASS	PASS	0	0	0	0
Phihong PSA16U-480	PASS	PASS	0	0	0	0
PowerDsine 3001	PASS	PASS	0	0	0	0
PowerDsine 6001	PASS	PASS	0	0	0	0
PowerDsine 6024	PASS	PASS	0	0	0	0
PowerDsine 3012	PASS	PASS	0	0	0	0
Vitesse SparX-G24 PoE	PASS	PASS	0	0	0	0

General note: Smartbits SX-7410B cards in a Spirent Smartbits 2000 chassis were used as the sourcing station during test # 1.1.3.

CAT 5 - TSB95 Spec - Maximum Attenuation

Parameter	Pair	Channel-1	Channel-2
Propagation Delay (ns)	(1, 2)	581.00	587.00
	(3, 6)	587.00	579.00
	(4, 5)	597.00	597.00
	(7, 8)	595.00	595.00
Propagation Delay Skew (ns)	(1, 2)	0.00	8.00
	(3, 6)	6.00	0.00
	(4, 5)	16.00	18.00
	(7, 8)	14.00	16.00

Parameter	Pair	Channel-1	Channel-2
Insertion Loss Margin (dB)	(1, 2)	0.50	0.50
	(3, 6)	0.40	0.60
	(4, 5)		
	(7, 8)		
Return Loss Margin (dB)	(1, 2)	4.20	6.30
	(3, 6)	6.00	6.30
	(4, 5)		
	(7, 8)		
Return Loss @ Remote Margin (dB)	(1, 2)	5.81	5.72
	(3, 6)	5.90	5.70
	(4, 5)		
	(7, 8)		
PSNEXT Margin (dB)	(1, 2)		
	(3, 6)		
	(4, 5)		
	(7, 8)		
PSNEXT @ Remote Margin (dB)	(1, 2)		
	(3, 6)		
	(4, 5)		
	(7, 8)		
PSELFEXT Margin (dB)	(1, 2)		
	(3, 6)		
	(4, 5)		
	(7, 8)		
PSELFEXT @ Remote Margin (dB)	(1, 2)		
	(3, 6)		
	(4, 5)		
	(7, 8)		

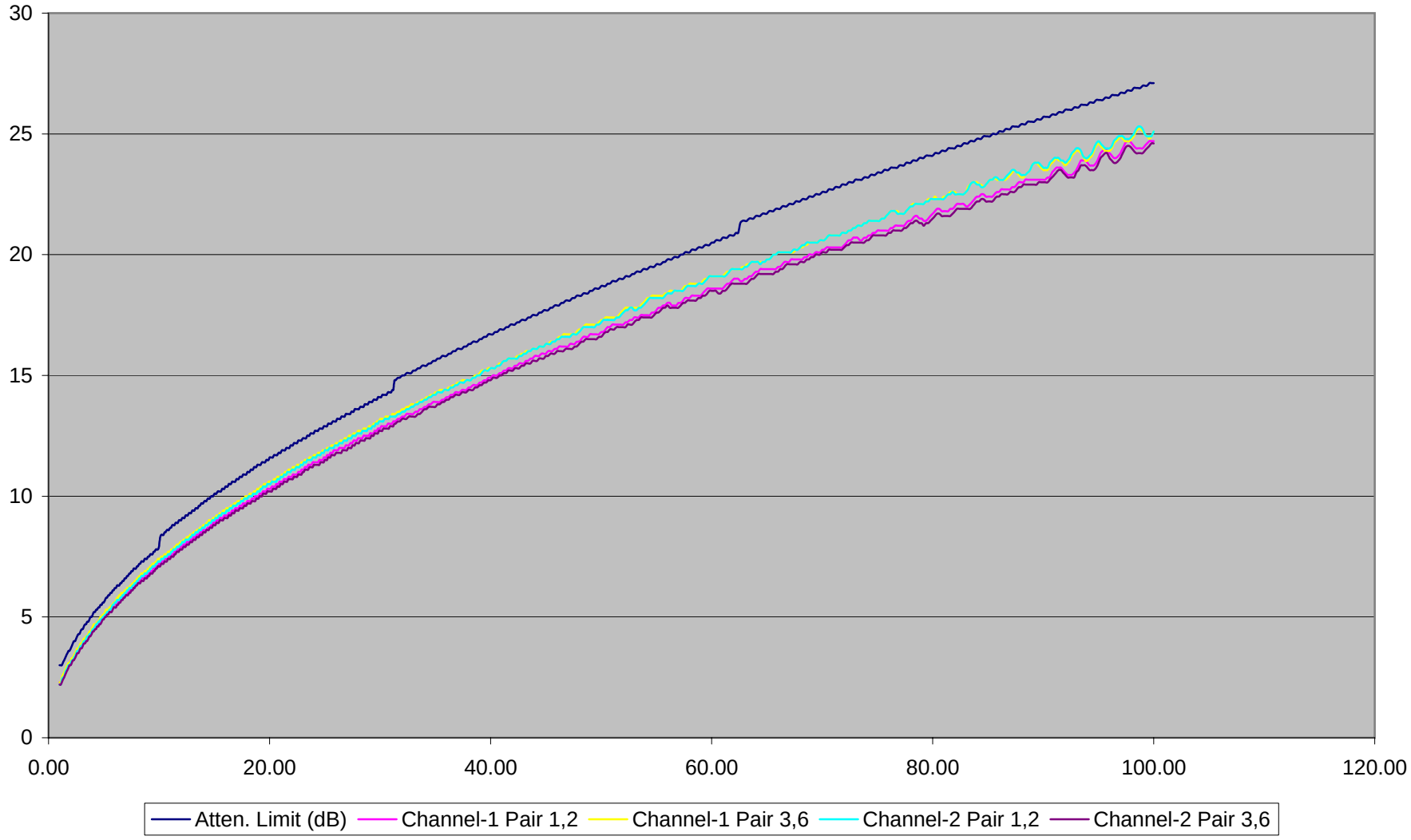
Channel 1 Description: Pass Through

Parameter	Generator-Receptor	Channel-1	Channel-2
NEXT Margin (dB)	(1, 2)-(3, 6)	9.60	9.30
	(1, 2)-(4, 5)		
	(1, 2)-(7, 8)		
	(3, 6)-(4, 5)		
	(3, 6)-(7, 8)		
	(4, 5)-(7, 8)		
NEXT @ Remote Margin (dB)	(1, 2)-(3, 6)	10.40	10.70
	(1, 2)-(4, 5)		
	(1, 2)-(7, 8)		
	(3, 6)-(4, 5)		
	(3, 6)-(7, 8)		
	(4, 5)-(7, 8)		

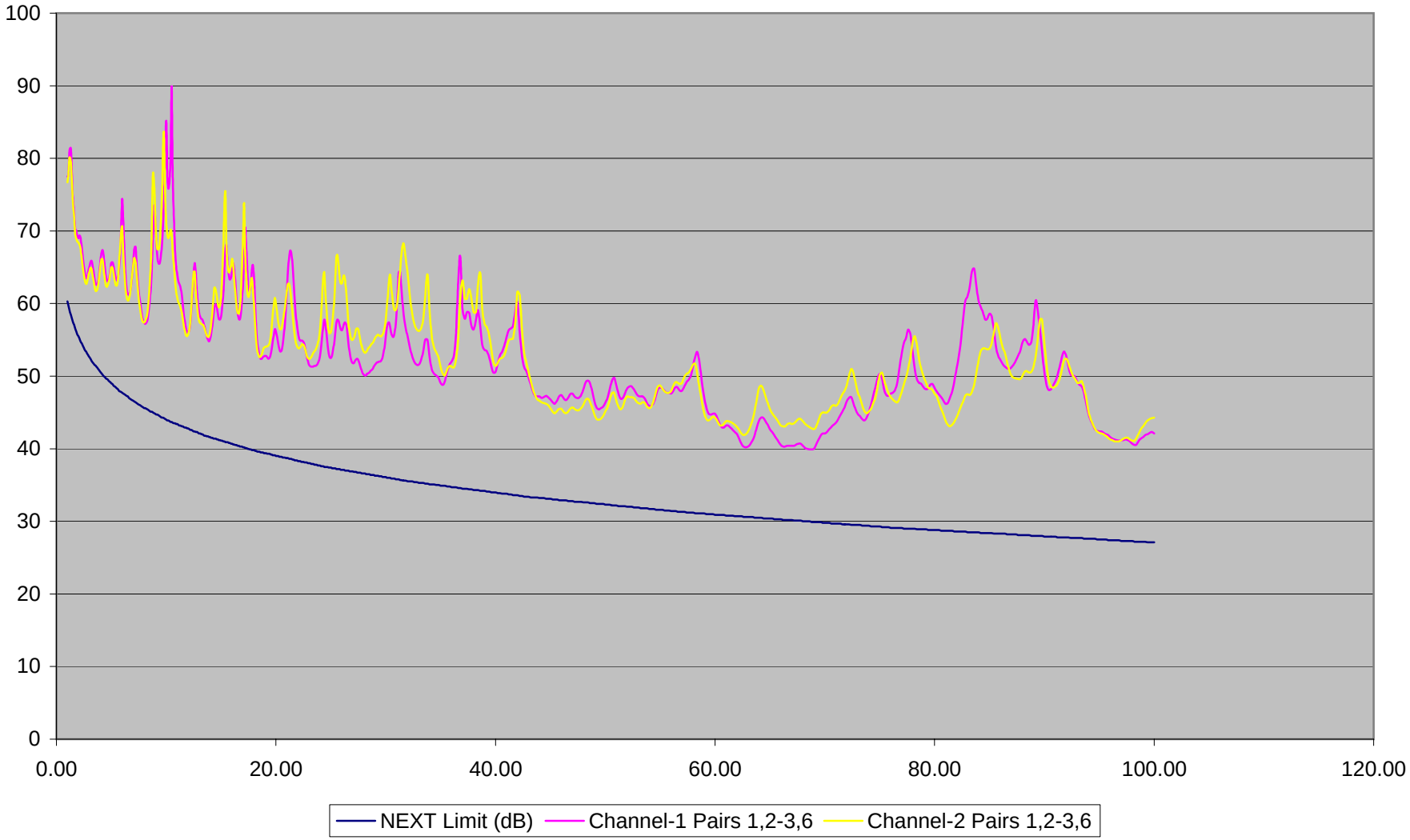
Parameter	Generator-Receptor	Channel-1	Channel-2
ELFEXT Margin (dB)	(1, 2)-(3, 6)		
	(1, 2)-(4, 5)		
	(1, 2)-(7, 8)		
	(3, 6)-(1, 2)		
	(3, 6)-(4, 5)		
	(3, 6)-(7, 8)		
	(4, 5)-(1, 2)		
	(4, 5)-(3, 6)		
	(4, 5)-(7, 8)		
	(7, 8)-(1, 2)		
	(7, 8)-(3, 6)		
	(7, 8)-(4, 5)		
ELFEXT @ Remote Margin (dB)	(1, 2)-(3, 6)		
	(1, 2)-(4, 5)		
	(1, 2)-(7, 8)		
	(3, 6)-(1, 2)		
	(3, 6)-(4, 5)		
	(3, 6)-(7, 8)		
	(4, 5)-(1, 2)		
	(4, 5)-(3, 6)		
	(4, 5)-(7, 8)		
	(7, 8)-(1, 2)		
	(7, 8)-(3, 6)		
	(7, 8)-(4, 5)		

Channel 2 Description: Crossover

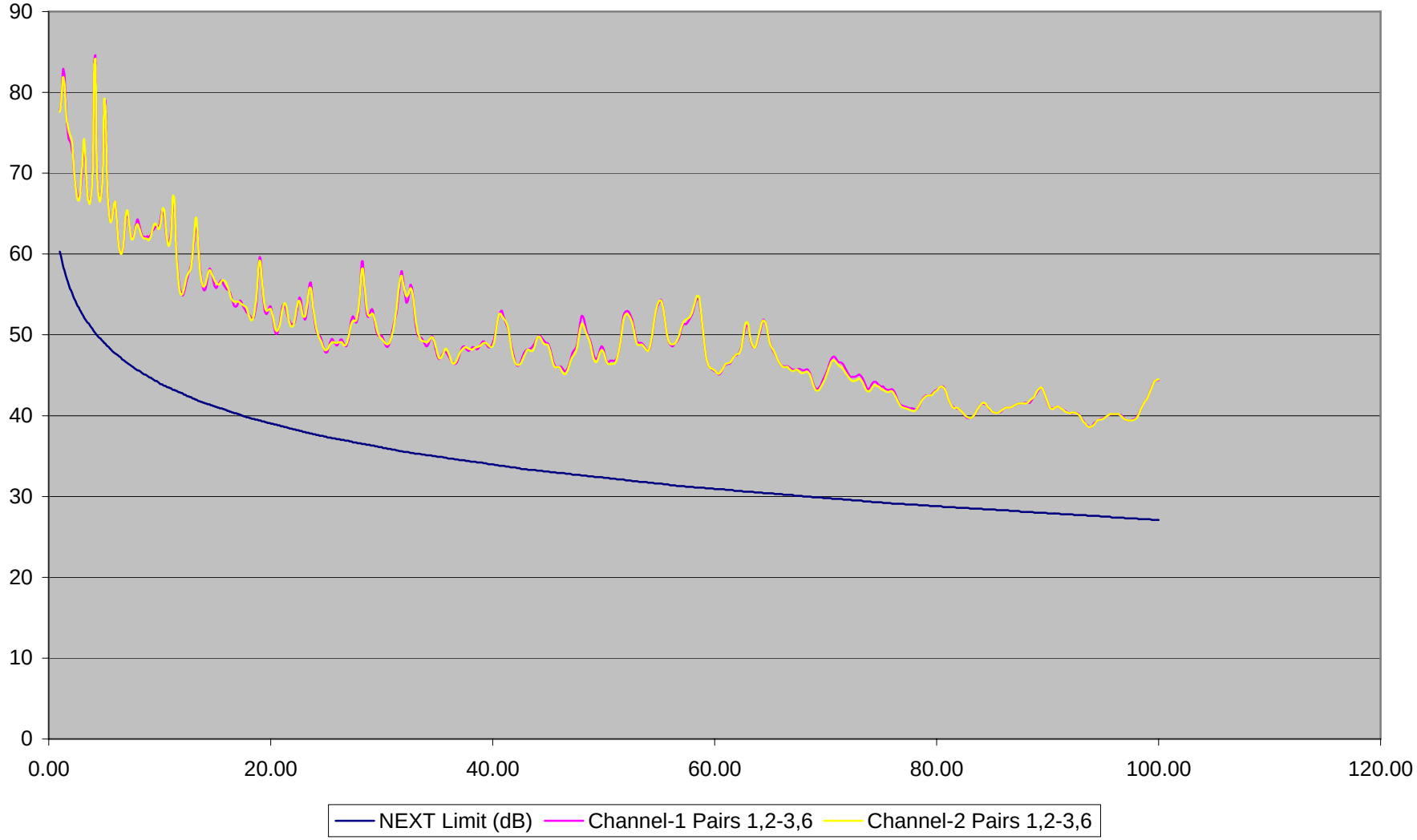
CAT 5 - TSB95 Spec @ Maximum Attenuation - Attenuation Plot
X-Axis Frequency (MHz), Y-Axis Attn (dB)



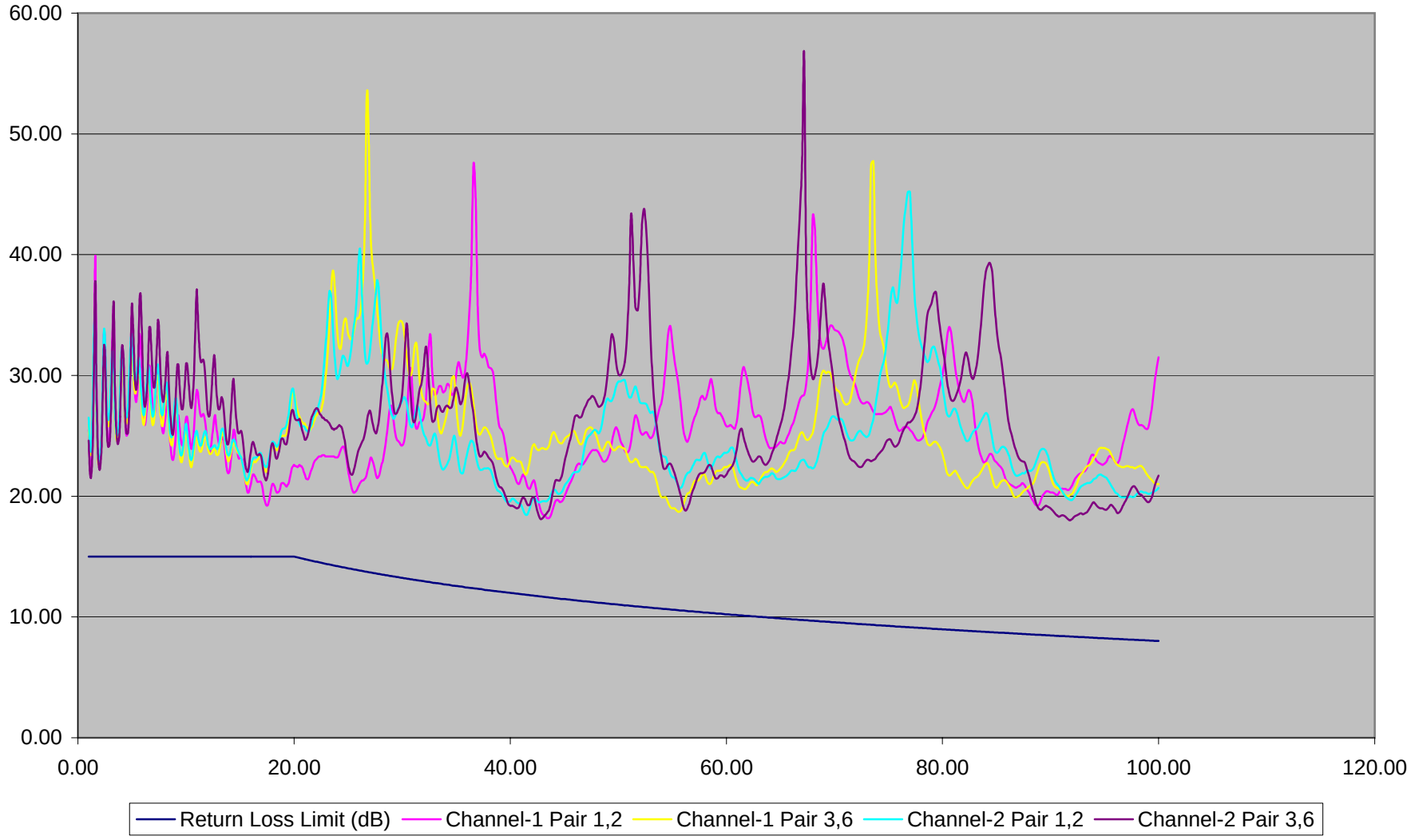
CAT 5 - TSB95 Spec @ Maximum Attenuation - Near End Cross Talk
X-Axis Frequency (MHz), Y-Axis NEXT (dB)



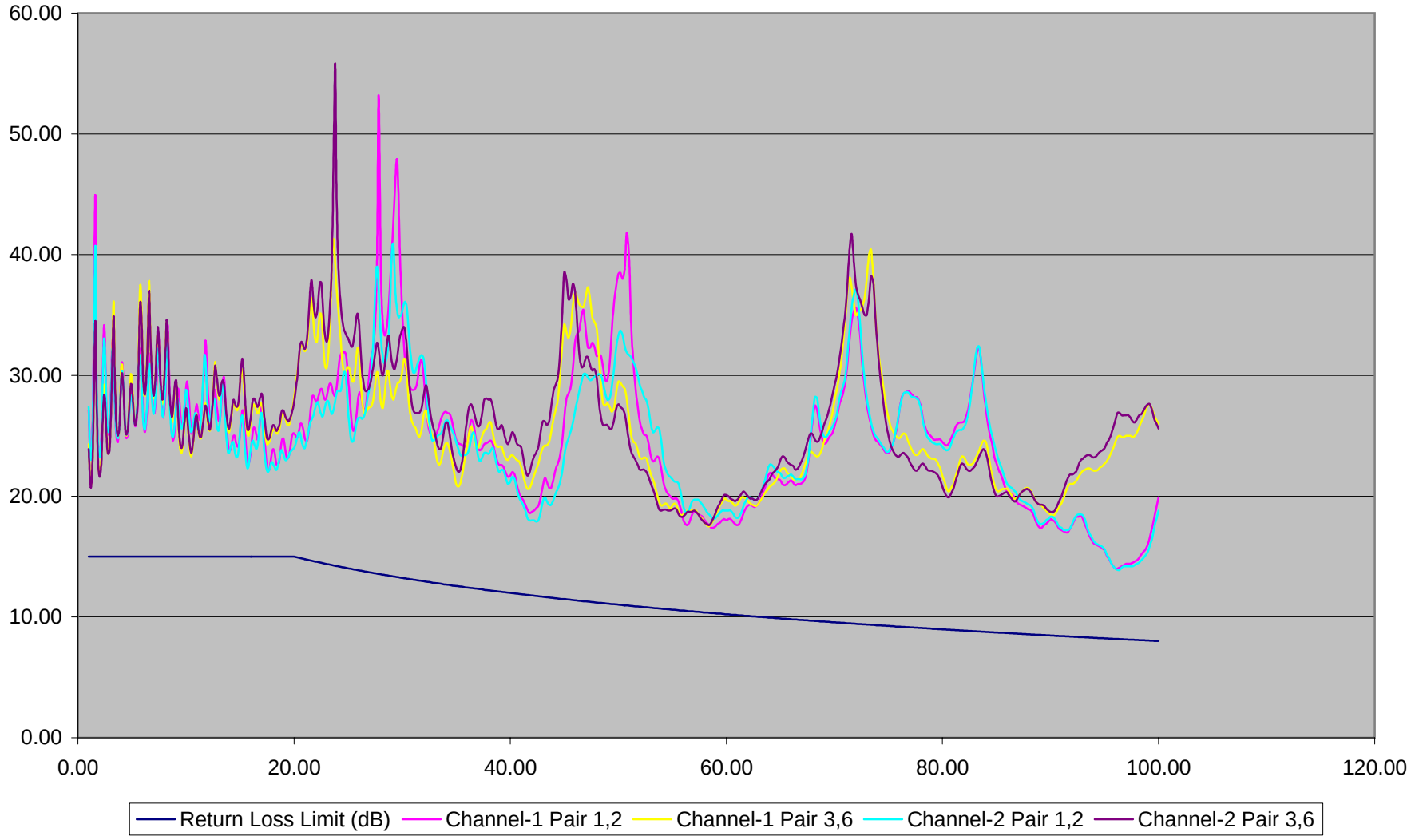
CAT 5 - TSB95 Spec @ Maximum Attenuation - Near End Cross Talk @ Remote
X-Axis Frequency (MHz), Y-Axis NEXT-R (dB)



CAT 5 - TSB95 Spec @ Maximum Attenuation - Return Loss
X-Axis Frequency (MHz), Y-Axis RL (dB)



CAT 5 - TSB95 Spec @ Maximum Attenuation - Return Loss @ Remote
X-Axis Frequency (MHz), Y-Axis RL-R (dB)



CAT 5 - TSB95 Spec - Low Attenuation

Parameter	Pair	Channel-1	Channel-2
Propagation Delay (ns)	(1, 2)	57.00	58.00
	(3, 6)	58.00	57.00
	(4, 5)	58.00	58.00
	(7, 8)	58.00	59.00
Propagation Delay Skew (ns)	(1, 2)	0.00	1.00
	(3, 6)	1.00	0.00
	(4, 5)	1.00	1.00
	(7, 8)	1.00	2.00

Parameter	Pair	Channel-1	Channel-2
Insertion Loss Margin (dB)	(1, 2)	2.90	2.90
	(3, 6)	2.90	2.90
	(4, 5)		
	(7, 8)		
Return Loss Margin (dB)	(1, 2)	5.90	4.59
	(3, 6)	4.80	5.67
	(4, 5)		
	(7, 8)		
Return Loss @ Remote Margin (dB)	(1, 2)	6.70	6.33
	(3, 6)	5.13	5.09
	(4, 5)		
	(7, 8)		
PSNEXT Margin (dB)	(1, 2)		
	(3, 6)		
	(4, 5)		
	(7, 8)		
PSNEXT @ Remote Margin (dB)	(1, 2)		
	(3, 6)		
	(4, 5)		
	(7, 8)		
PSELFEXT Margin (dB)	(1, 2)		
	(3, 6)		
	(4, 5)		
	(7, 8)		
PSELFEXT @ Remote Margin (dB)	(1, 2)		
	(3, 6)		
	(4, 5)		
	(7, 8)		

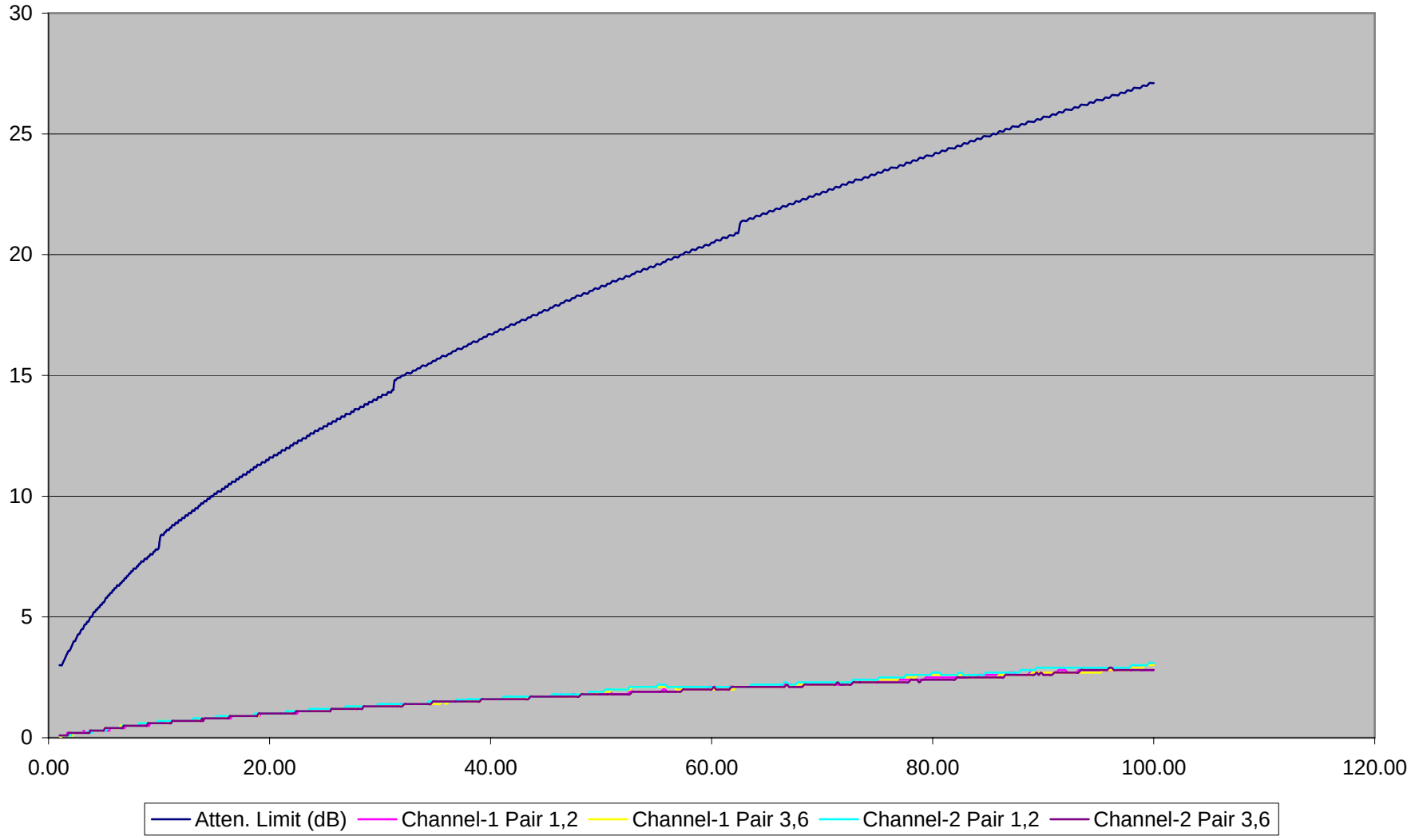
Channel 1 Description: Pass Through

Parameter	Generator-Receptor	Channel-1	Channel-2
NEXT Margin (dB)	(1, 2)-(3, 6)	9.70	11.00
	(1, 2)-(4, 5)		
	(1, 2)-(7, 8)		
	(3, 6)-(4, 5)		
	(3, 6)-(7, 8)		
	(4, 5)-(7, 8)		
NEXT @ Remote Margin (dB)	(1, 2)-(3, 6)	11.60	10.40
	(1, 2)-(4, 5)		
	(1, 2)-(7, 8)		
	(3, 6)-(4, 5)		
	(3, 6)-(7, 8)		
	(4, 5)-(7, 8)		

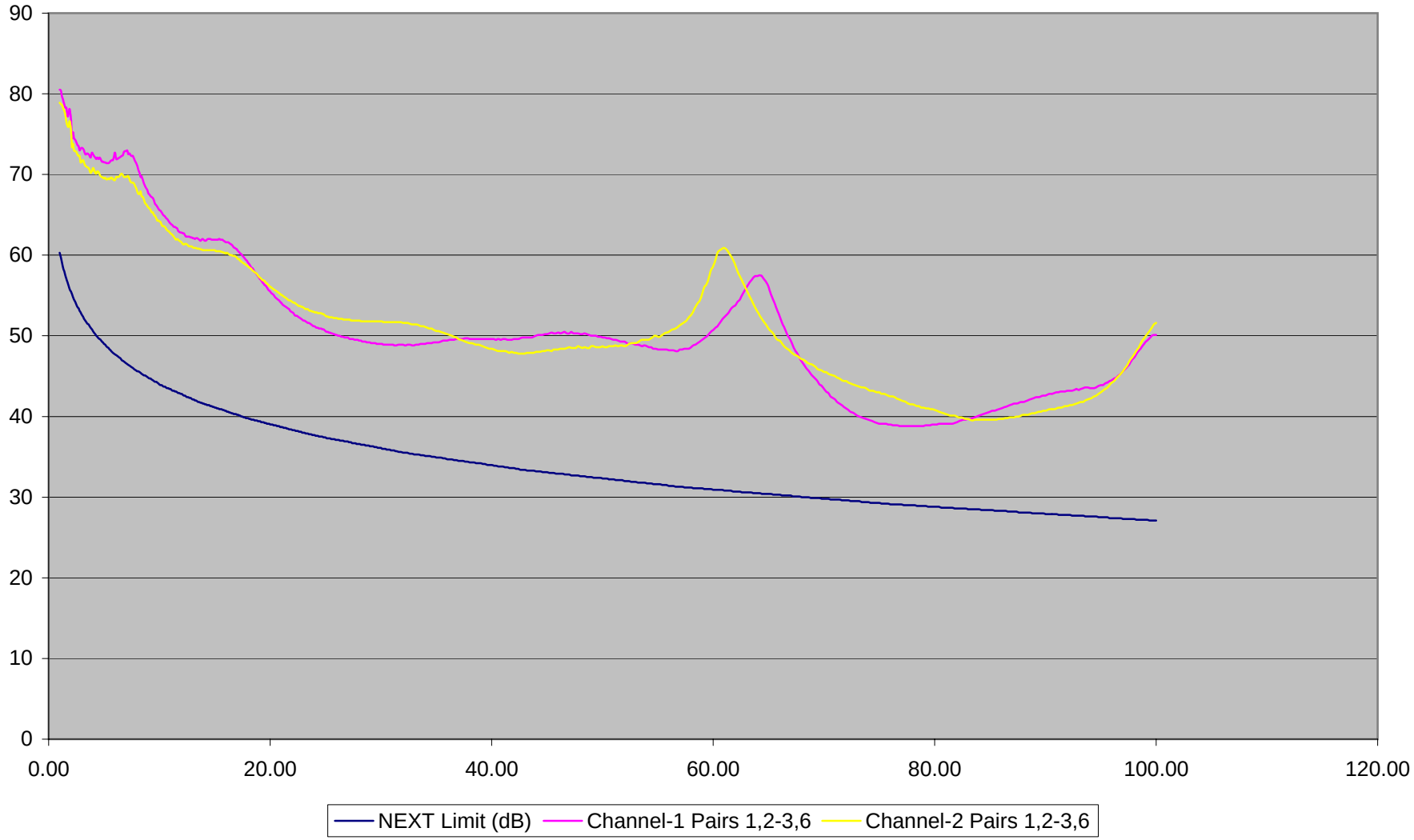
Parameter	Generator-Receptor	Channel-1	Channel-2
ELFEXT Margin (dB)	(1, 2)-(3, 6)		
	(1, 2)-(4, 5)		
	(1, 2)-(7, 8)		
	(3, 6)-(1, 2)		
	(3, 6)-(4, 5)		
	(3, 6)-(7, 8)		
	(4, 5)-(1, 2)		
	(4, 5)-(3, 6)		
	(4, 5)-(7, 8)		
	(7, 8)-(1, 2)		
	(7, 8)-(3, 6)		
	(7, 8)-(4, 5)		
ELFEXT @ Remote Margin (dB)	(1, 2)-(3, 6)		
	(1, 2)-(4, 5)		
	(1, 2)-(7, 8)		
	(3, 6)-(1, 2)		
	(3, 6)-(4, 5)		
	(3, 6)-(7, 8)		
	(4, 5)-(1, 2)		
	(4, 5)-(3, 6)		
	(4, 5)-(7, 8)		
	(7, 8)-(1, 2)		
	(7, 8)-(3, 6)		
	(7, 8)-(4, 5)		

Channel 2 Description: Crossover

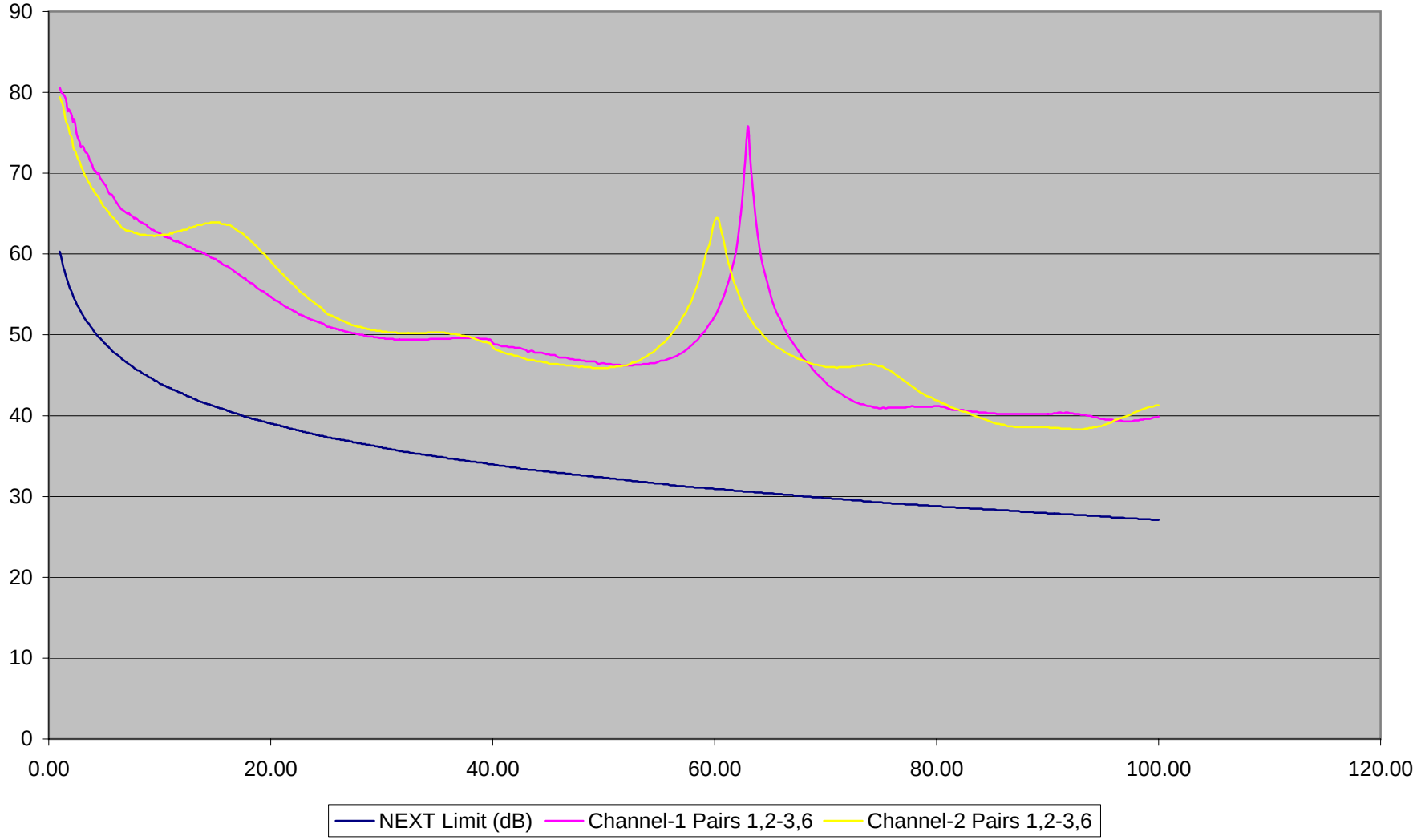
CAT 5 - TSB95 Spec @ Low Attenuation - Attenuation Plot
X-Axis Frequency (MHz), Y-Axis Attn (dB)



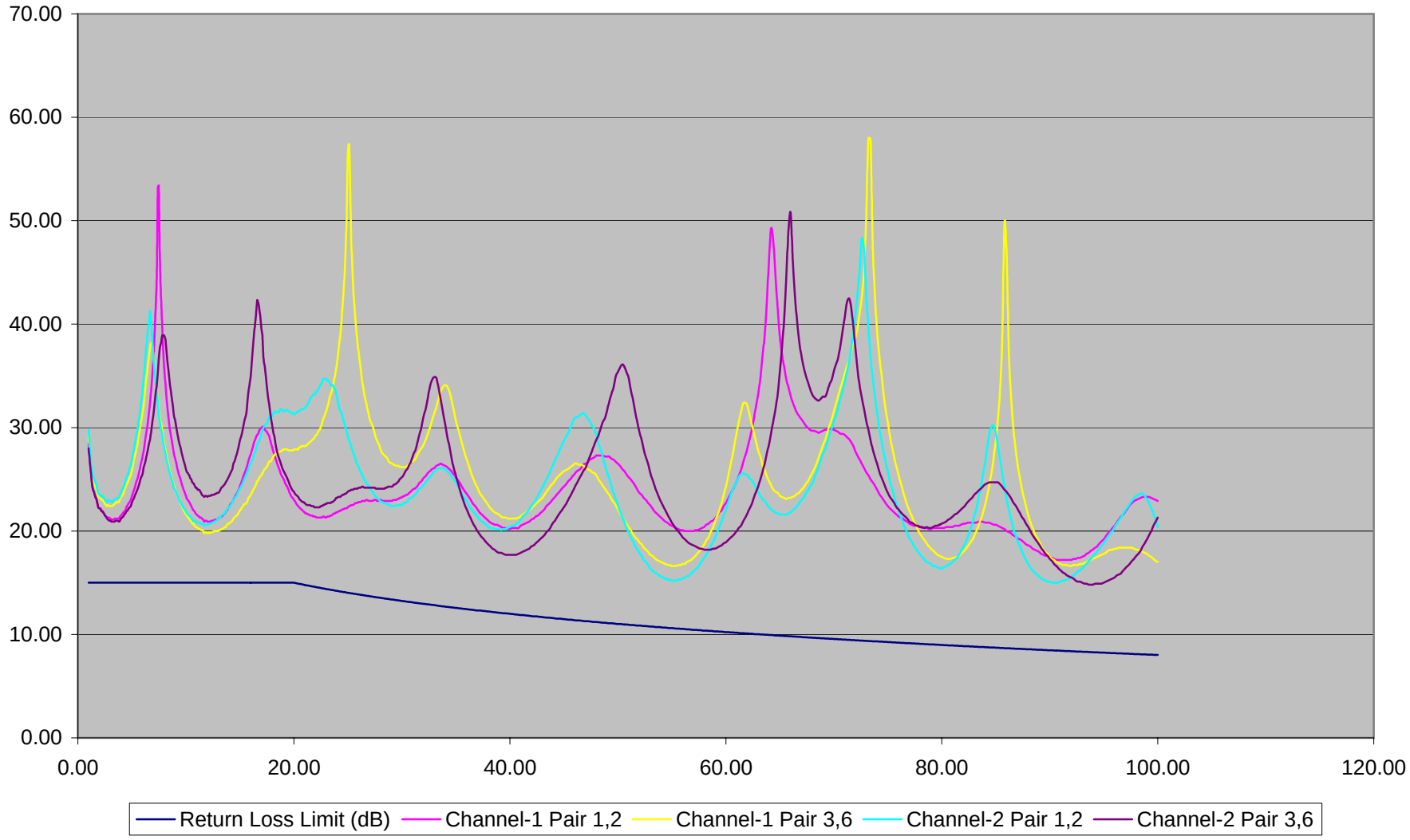
CAT 5 - TSB95 Spec @ Low Attenuation - Near End Cross Talk
X-Axis Frequency (MHz), Y-Axis NEXT (dB)



CAT 5 - TSB95 Spec @ Low Attenuation - Near End Cross Talk @ Remote
X-Axis Frequency (MHz), Y-Axis NEXT-R (dB)



CAT 5 - TSB95 Spec @ Low Attenuation - Return Loss
X-Axis Frequency (MHz), Y-Axis RL (dB)



CAT 5 - TSB95 Spec @ Low Attenuation - Return Loss @ Remote
X-Axis Frequency (MHz), Y-Axis RL-R (dB)