# Power over Ethernet Consortium
## Interoperability Test Suite v2.3 Report

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31-Jul-2006
Report Rev. 1.0

Enclosed are the results from the PD interoperability testing performed on:

| | |
|---|---|
| Device Under Test (DUT): | Globtek, Inc. GT-91080-XXXX PoE Splitter |
| Hardware Version: | Not Available |
| Software Version: | Not Applicable |
| Magnetics: | Not Available |
| Miscellaneous: | 24V Output, Load attached |

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
07/25/2006

Matthew F Borowski

Matthew Borowski
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Digitally signed by UNH-IOL
Date: 2006.07.31 12:55:24 -04'00'

Review Completed
07/31/2006

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## Result Key

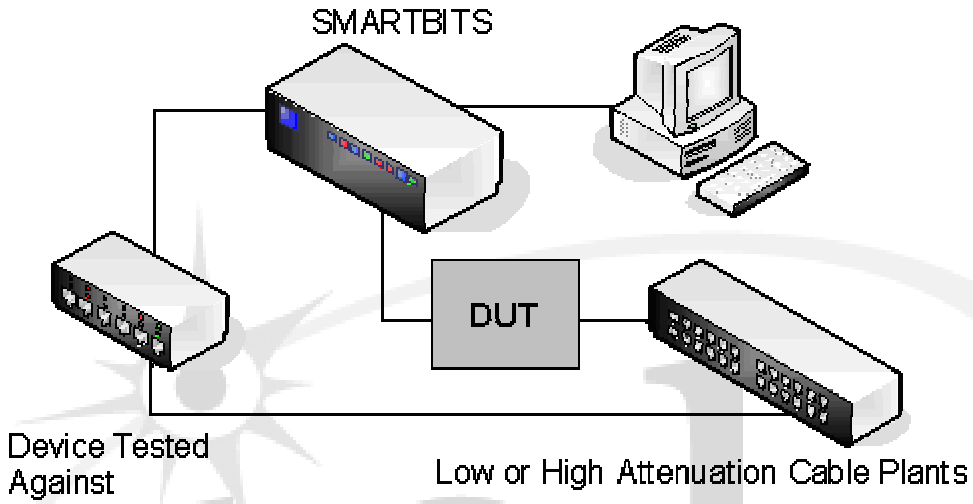
The following table contains possible results and their meanings:

| 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 connecting the DUT to the link partner while it is on and performing detection. The link partner should be able to provide power to the DUT. Refer to the following tables for further information regarding the results from this test.

*Case 2:* This test entails power cycling the Link Partner ( 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.

**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 powered devices that only support power.*

*Case 1:* This test entails connecting the DUT to the link partner while it is on and performing detection. The link partner should be able to provide power to the DUT. 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 1 | Case 2 | 64 Byte | 1518 Byte | 64 Byte | 1518 Byte |
| 3Com 4400 PSE Switch | PASS | PASS | 0 | 0 | 0 | 0 |
| 3Com NetJack 100 old | PASS | PASS | 0 | 0 | 0 | 0 |
| 3Com NetJack 100 new | PASS | PASS | 0 | 0 | 0 | 0 |
| 3Com NetJack 105 | 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 220 | PASS | PASS | 0 | 0 | 0 | 0 |
| Avaya P333T-PWR | PASS | PASS | 0 | 0 | 0 | 0 |
| Broadcom XGS2 24-port | PASS | PASS | 0 | 0 | 0 | 0 |
| Broadcom XGS3 48-port | 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 |
| Matsushita Switch-S12PWR | PASS | PASS | 0 | 0 | 0 | 0 |
| Matsushita M12PWR | 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 POE30U-560 | 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 |

**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) | 579.00 | 579.00 |
| | (3, 6) | 587.00 | 583.00 |
| | (4, 5) | 597.00 | 597.00 |
| | (7, 8) | 591.00 | 591.00 |
| Propagation Delay Skew (ns) | (1, 2) | 0.00 | 0.00 |
| | (3, 6) | 8.00 | 4.00 |
| | (4, 5) | 18.00 | 18.00 |
| | (7, 8) | 12.00 | 12.00 |

| Parameter | Pair | Channel-1 | Channel-2 |
|---|---|---|---|
| Insertion Loss Margin (dB) | (1, 2) | 0.50 | 0.60 |
| | (3, 6) | 0.40 | 0.40 |
| | (4, 5) | | |
| | (7, 8) | | |
| Return Loss Margin (dB) | (1, 2) | 6.10 | 7.00 |
| | (3, 6) | 6.30 | 5.90 |
| | (4, 5) | | |
| | (7, 8) | | |
| Return Loss @ Remote Margin (dB) | (1, 2) | 8.12 | 8.85 |
| | (3, 6) | 6.40 | 5.40 |
| | (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) | | |

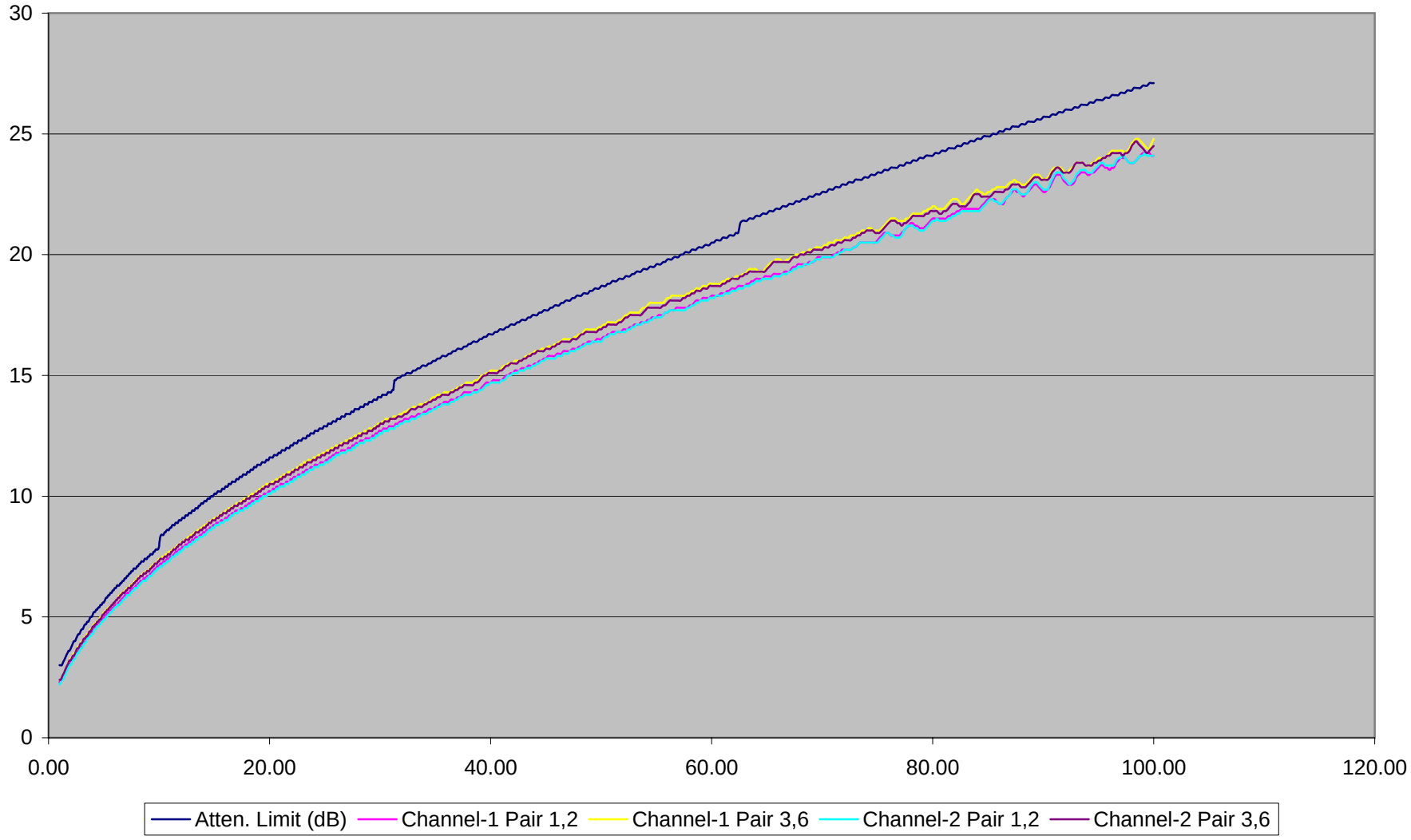
Channel 1 Description: Pass Through

| Parameter | Generator-Receptor | Channel-1 | Channel-2 |
|---|---|---|---|
| NEXT Margin (dB) | (1, 2)-(3, 6) | 11.50 | 11.50 |
| | (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) | 8.50 | 10.20 |
| | (1, 2)-(4, 5) | | |
| | (1, 2)-(7, 8) | | |
| | (3, 6)-(4, 5) | | |
| | (3, 6)-(7, 8) | | |
| | (4, 5)-(7, 8) | | |

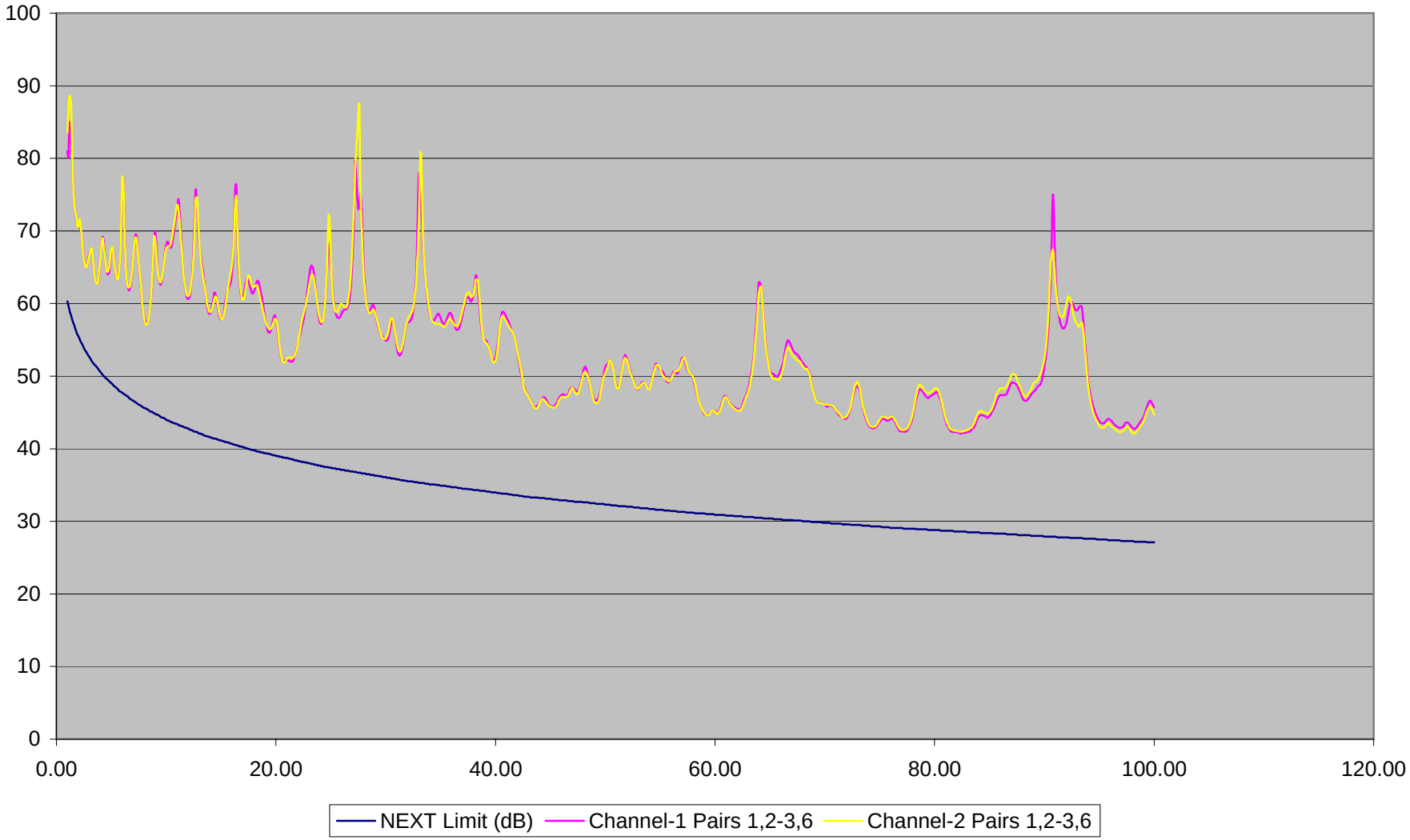
| Parameter | Generator-Receptor | Channel-1 | Channel-2 |
|---|---|---|---|
| ELFEXT Margin (dB) | (1, 2)-(3, 6) | | |
| | (1, 2)-(4, 5) | | |
| | (1, 2)-(7, 8) | | |
| | (3, 6)-(1, 2) | | |
| | (3, 6)-(4, 5) | | |
| | (3, 6)-(7, 8) | | |
| | (4, 5)-(1, 2) | | |
| | (4, 5)-(3, 6) | | |
| | (4, 5)-(7,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

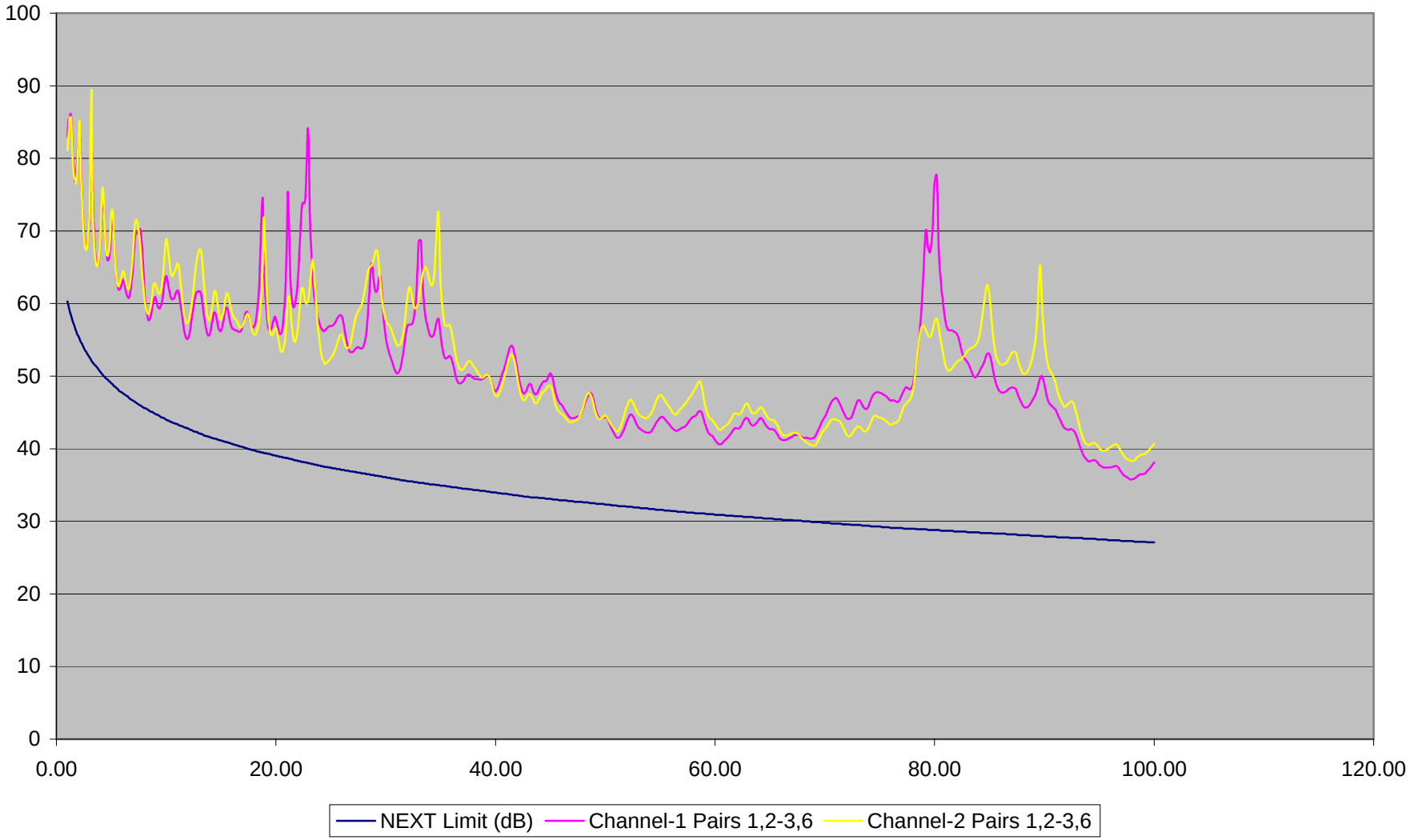
**CAT 5 - TSB95 Spec @ Maximum Attenuation - Attenuation Plot**
**X-Axis Frequency (MHz), Y-Axis Attn (dB)**



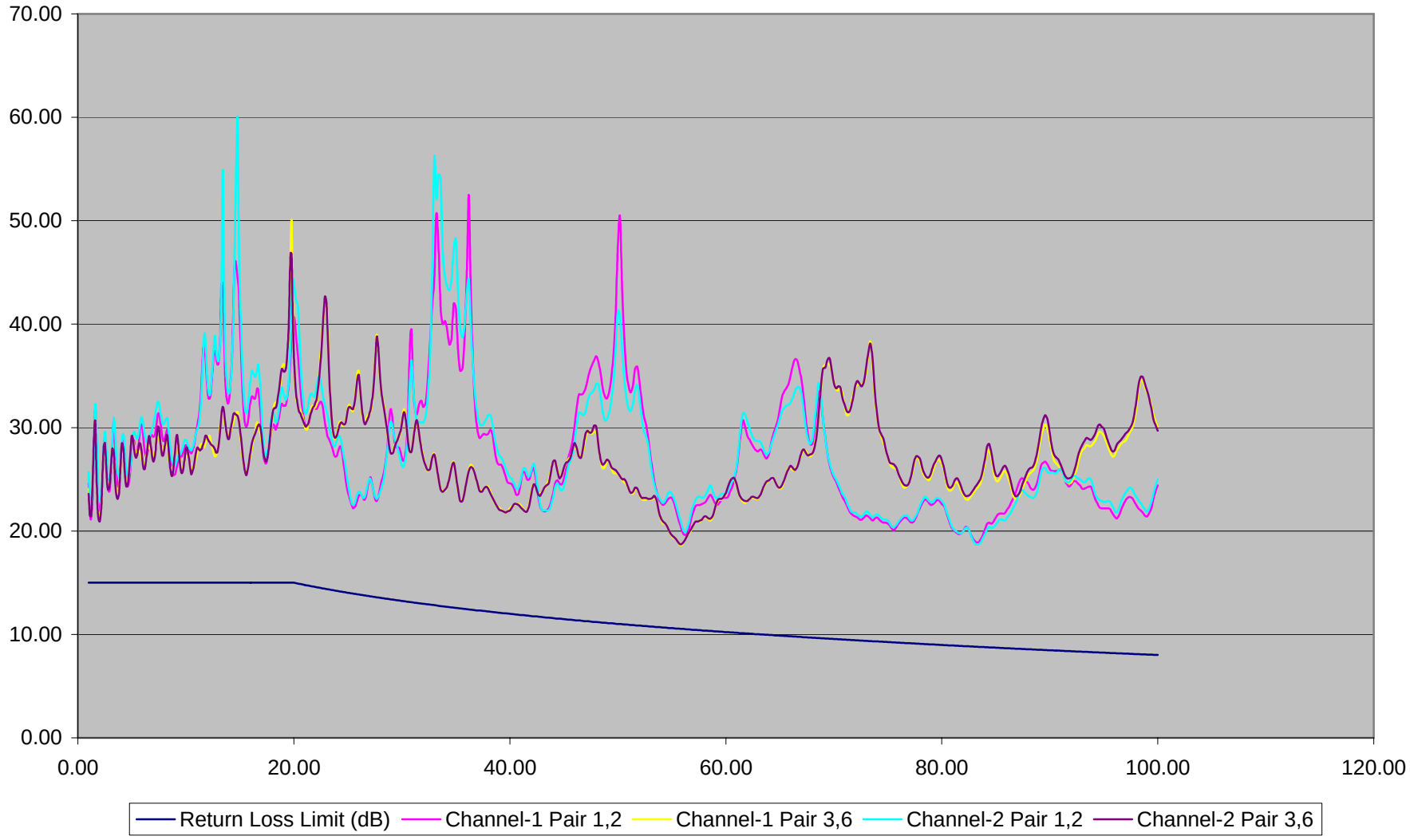
**CAT 5 - TSB95 Spec @ Maximum Attenuation - Near End Cross Talk**
**X-Axis Frequency (MHz), Y-Axis NEXT (dB)**



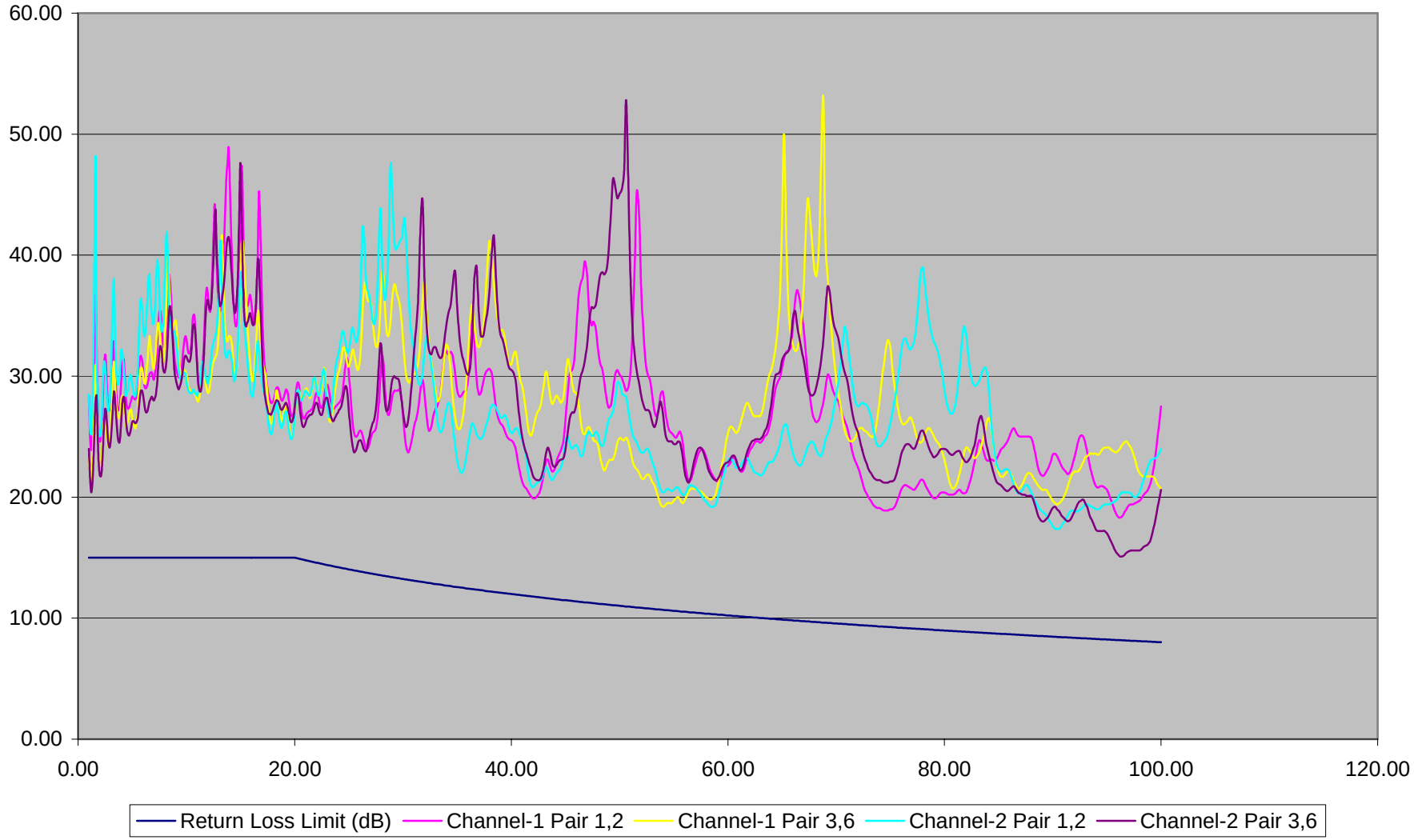
**CAT 5 - TSB95 Spec @ Maximum Attenuation - Near End Cross Talk @ Remote**
**X-Axis Frequency (MHz), Y-Axis NEXT-R (dB)**



**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 | 57.00 |
| | (3, 6) | 58.00 | 57.00 |
| | (4, 5) | 58.00 | 57.00 |
| | (7, 8) | 57.00 | 57.00 |
| Propagation Delay Skew (ns) | (1, 2) | 0.00 | 0.00 |
| | (3, 6) | 1.00 | 0.00 |
| | (4, 5) | 1.00 | 0.00 |
| | (7, 8) | 0.00 | 0.00 |

| Parameter | Pair | Channel-1 | Channel-2 |
|---|---|---|---|
| Insertion Loss Margin (dB) | (1, 2) | 2.80 | 2.80 |
| | (3, 6) | 2.80 | 2.70 |
| | (4, 5) | | |
| | (7, 8) | | |
| Return Loss Margin (dB) | (1, 2) | 7.40 | 8.20 |
| | (3, 6) | 6.97 | 6.50 |
| | (4, 5) | | |
| | (7, 8) | | |
| Return Loss @ Remote Margin (dB) | (1, 2) | 8.68 | 7.15 |
| | (3, 6) | 7.43 | 8.00 |
| | (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) | | |

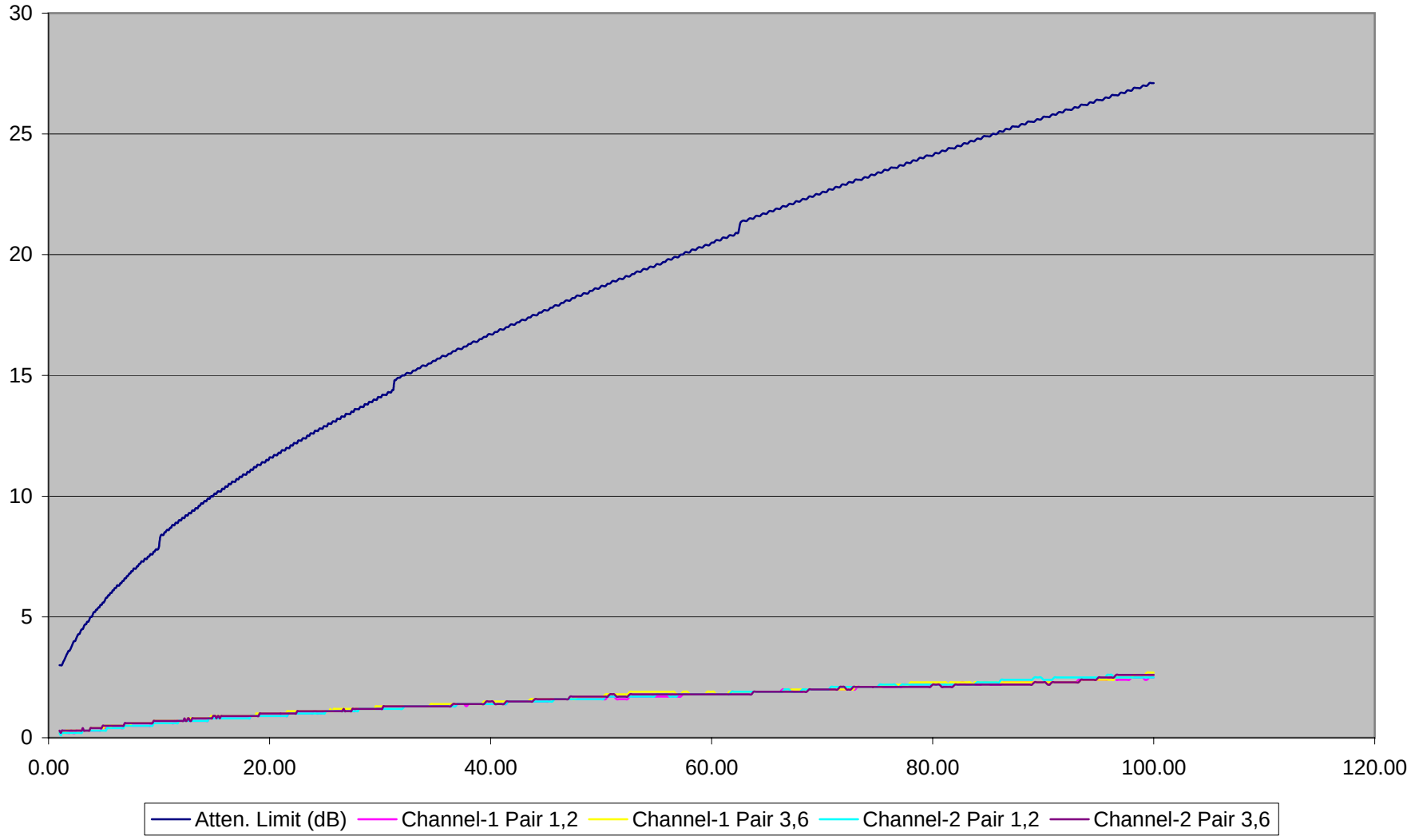
Channel 1 Description: Pass Through

| Parameter | Generator-Receptor | Channel-1 | Channel-2 |
|---|---|---|---|
| NEXT Margin (dB) | (1, 2)-(3, 6) | 11.00 | 10.20 |
| | (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) | 10.30 | 10.20 |
| | (1, 2)-(4, 5) | | |
| | (1, 2)-(7, 8) | | |
| | (3, 6)-(4, 5) | | |
| | (3, 6)-(7, 8) | | |
| | (4, 5)-(7, 8) | | |

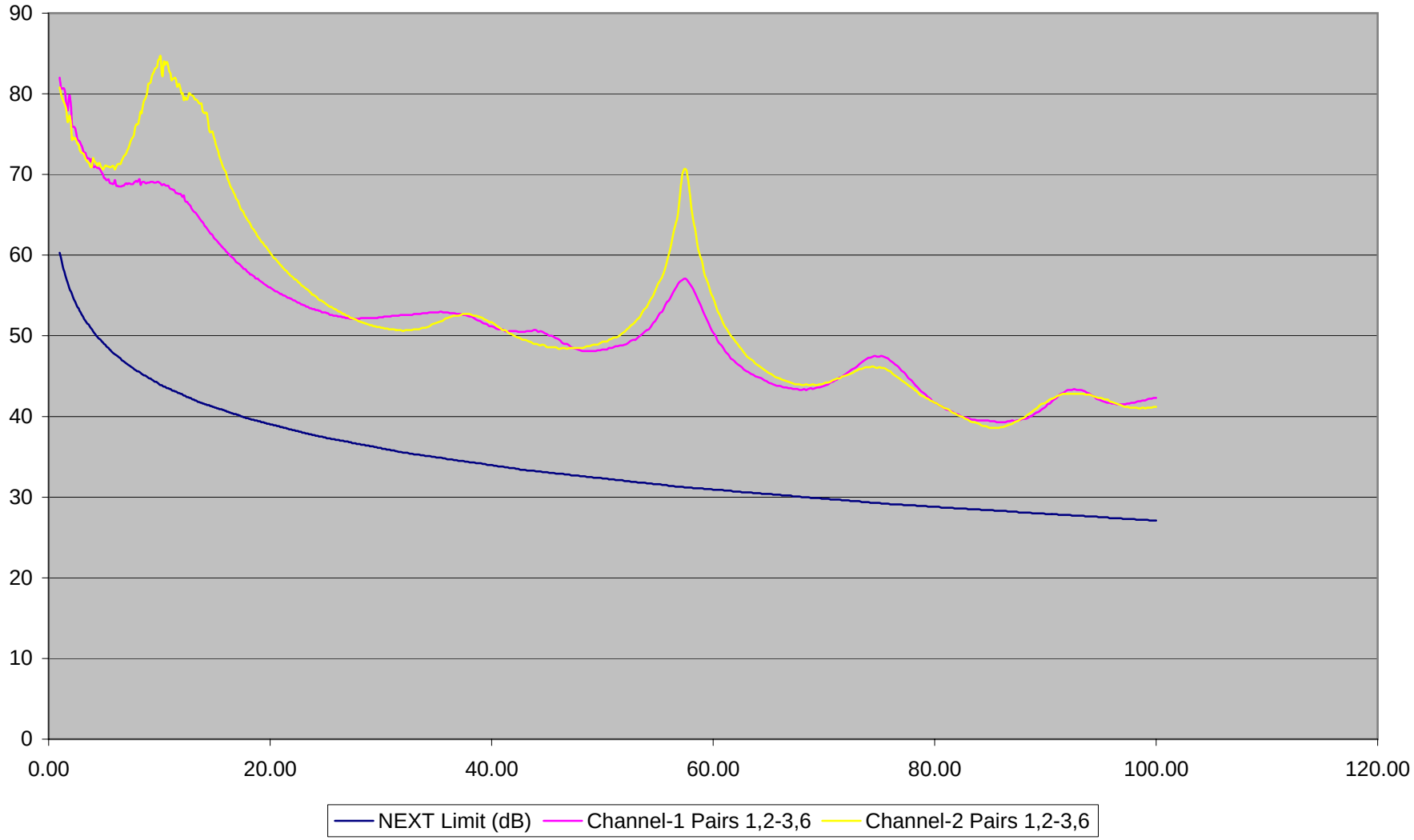
| Parameter | Generator-Receptor | Channel-1 | Channel-2 |
|---|---|---|---|
| ELFEXT Margin (dB) | (1, 2)-(3, 6) | | |
| | (1, 2)-(4, 5) | | |
| | (1, 2)-(7, 8) | | |
| | (3, 6)-(1, 2) | | |
| | (3, 6)-(4, 5) | | |
| | (3, 6)-(7, 8) | | |
| | (4, 5)-(1, 2) | | |
| | (4, 5)-(3, 6) | | |
| | (4, 5)-(7,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

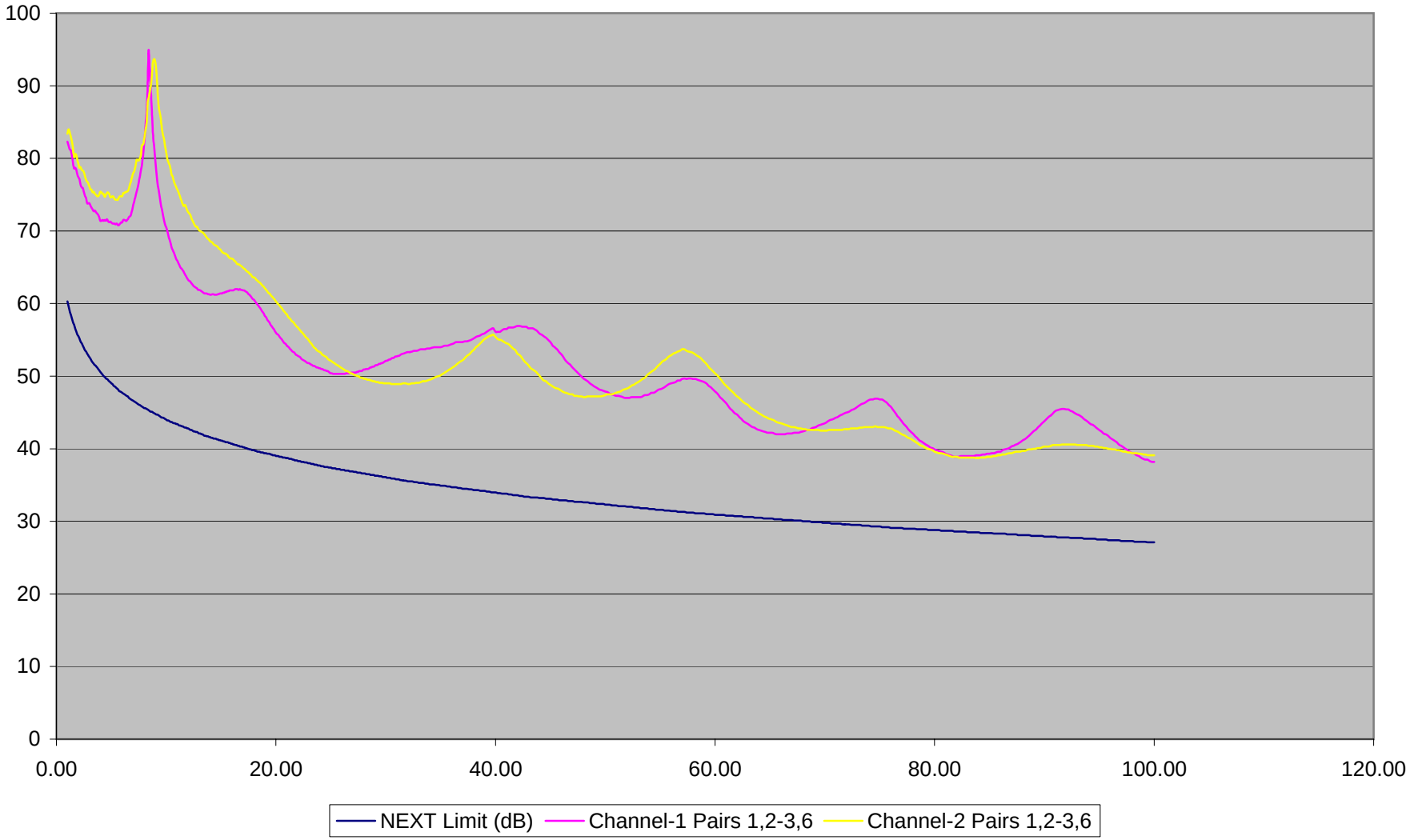
**CAT 5 - TSB95 Spec @ Low Attenuation - Attenuation Plot**
**X-Axis Frequency (MHz), Y-Axis Attn (dB)**



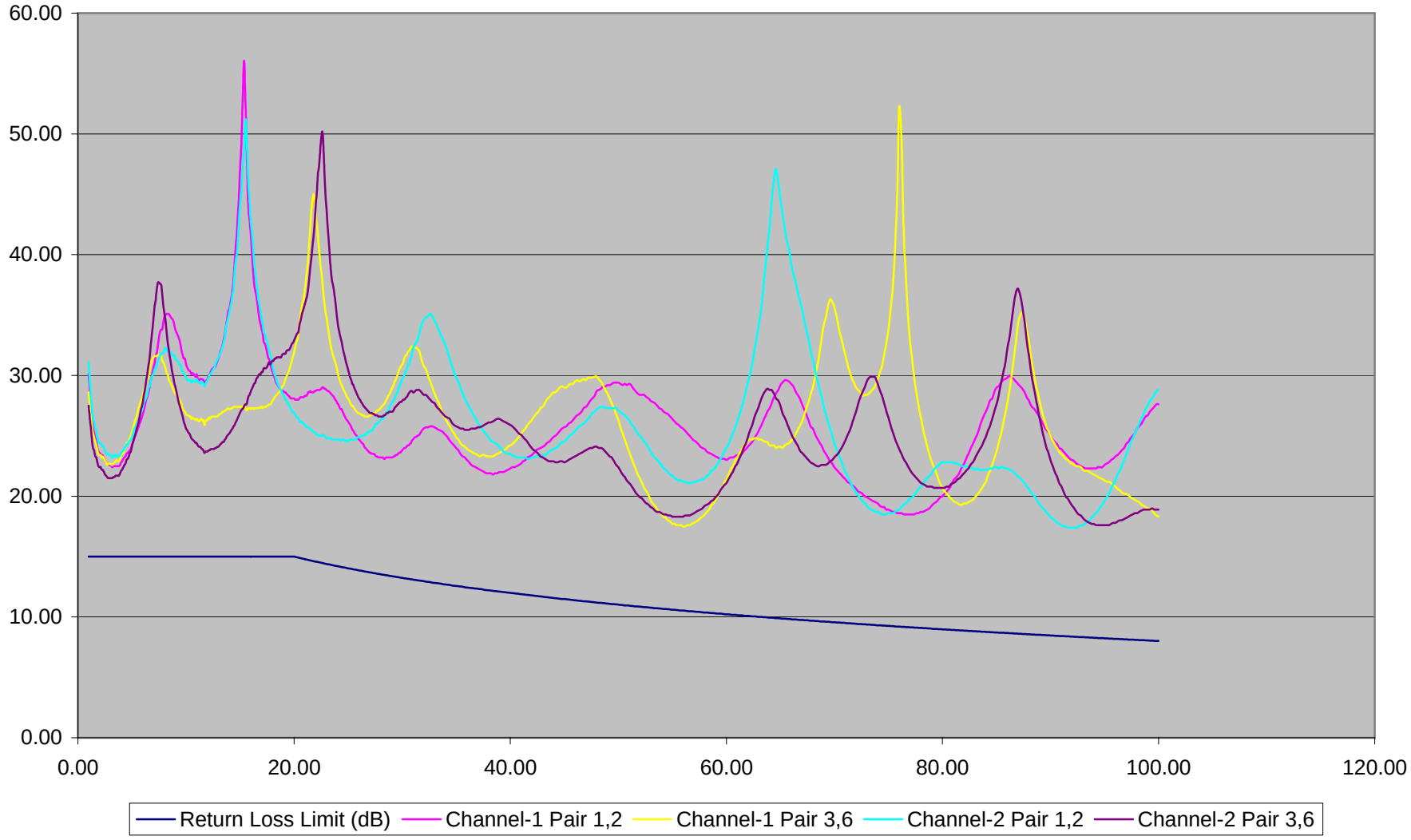
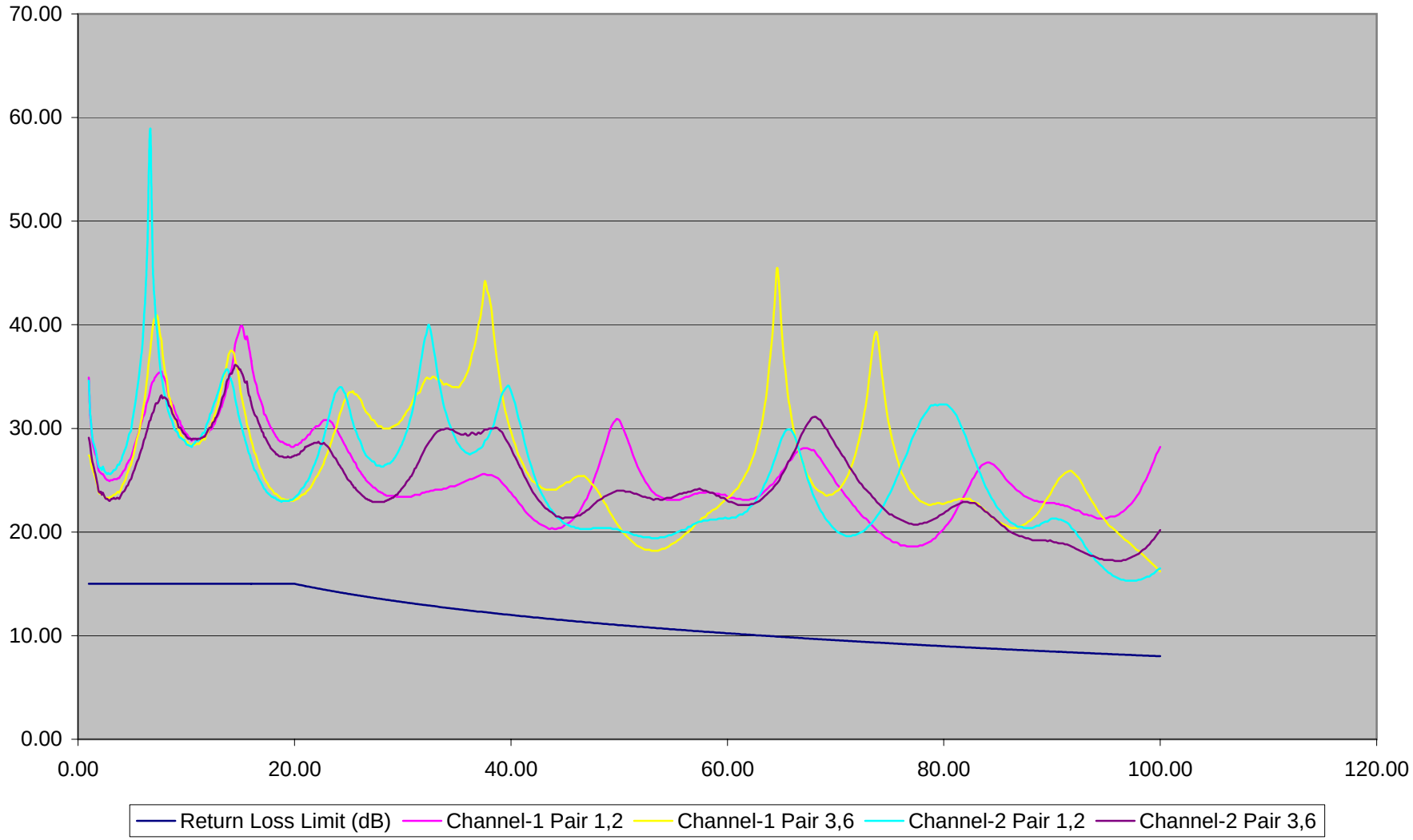
**CAT 5 - TSB95 Spec @ Low Attenuation - Near End Cross Talk**
**X-Axis Frequency (MHz), Y-Axis NEXT (dB)**



**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)**