# 802.3bj Draft 2.0 Copper Cable Specifications VS COM Simulations

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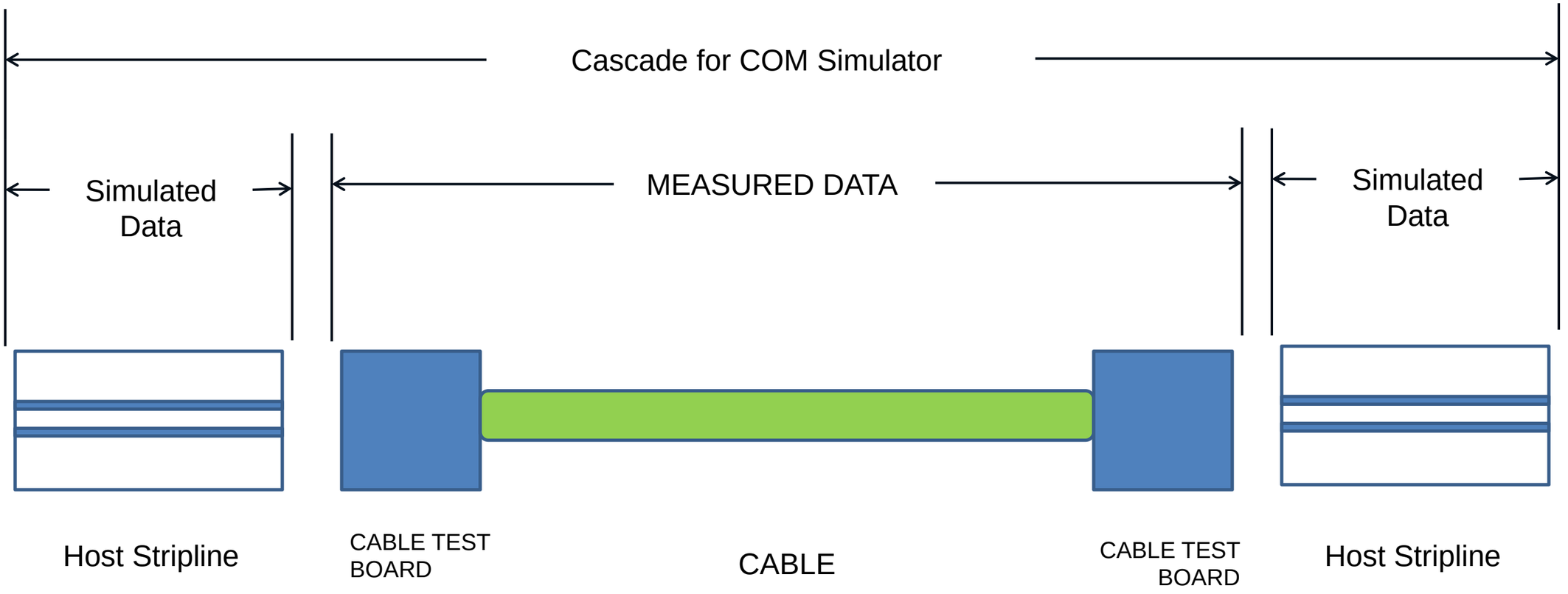
# Supporters.

- **Mark Bugg** **Molex**
- **Tom Palkert** **Molex**
- **Charles Moore** **Avago**

# Introduction

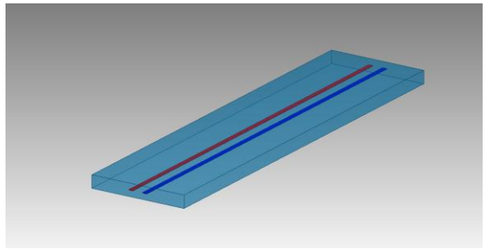
- **This presentation uses COM to analyze the complete channel performance of a number of passive cable channels that fail the existing 802.3bj draft 2.0 clause 93 cable specifications.**
- **It shows that these cables have adequate system performance and suggests changing the cable specifications.**
- **It is in support of comment 188 against 802.3bj draft 2.0**
- **In the following slides a red circle highlights failures against the existing 802.3bj draft specification.**

# Simulated and Measured Data

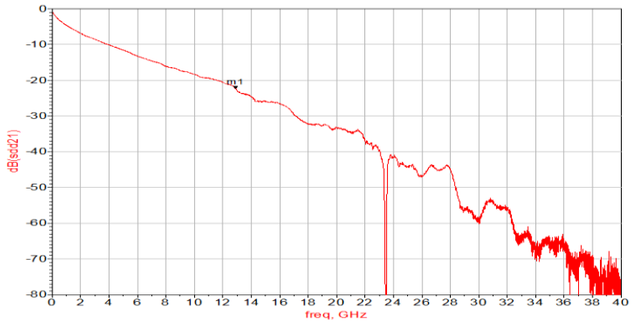


# Channel Description

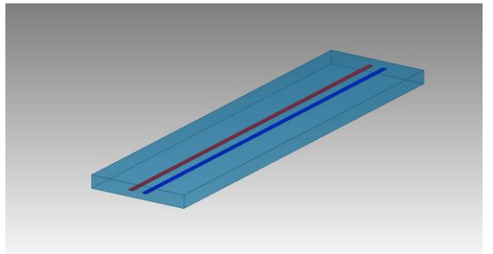
Cascade for COM Simulator



Simulated Stripline: 6.26dB loss at 12.89GHz (6.81dB-1.17dB+0.62dB). (Max host board loss – compliance board loss + extra loss allowed for host connector).

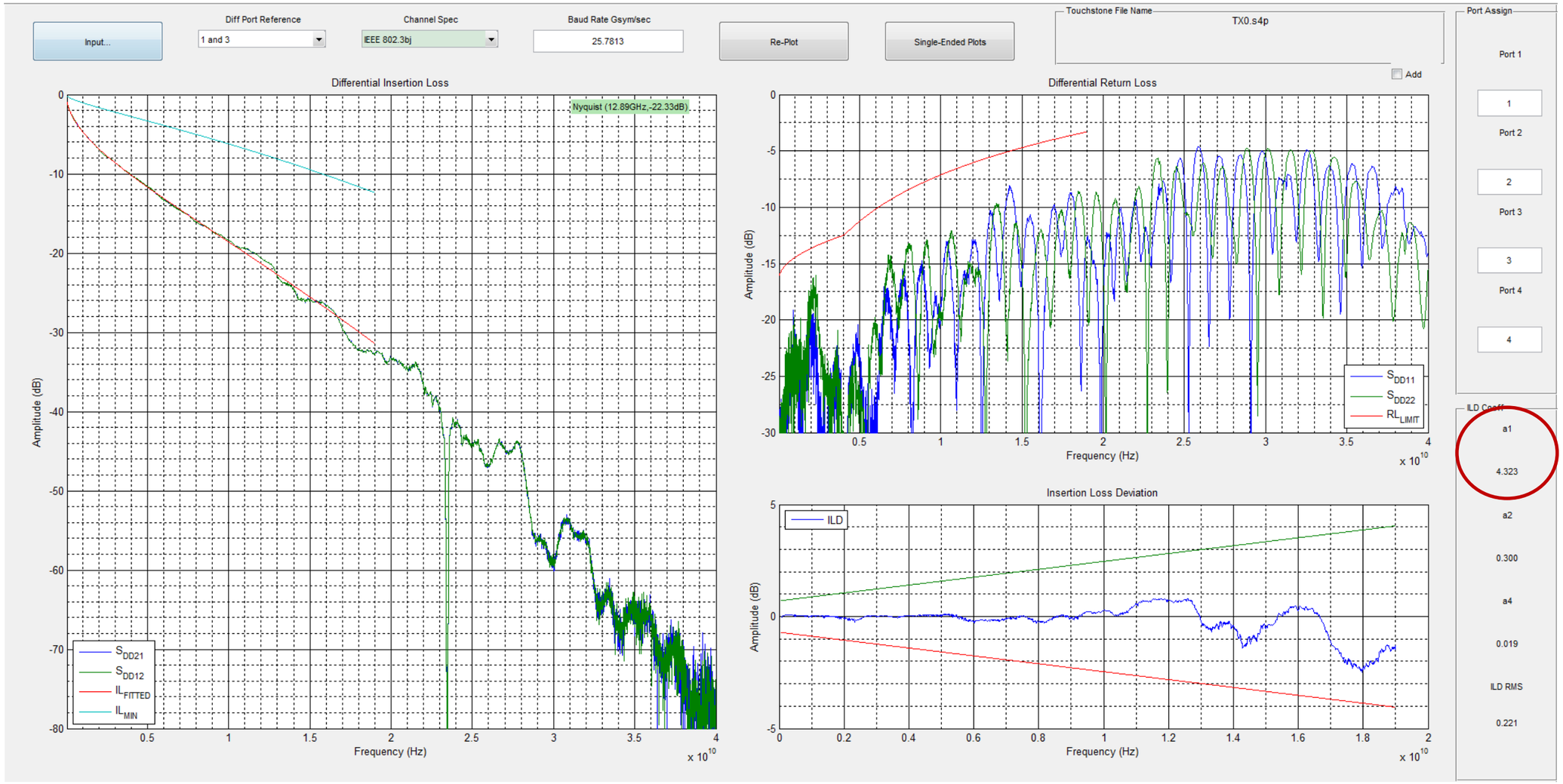



CABLE DATA measured with test boards.



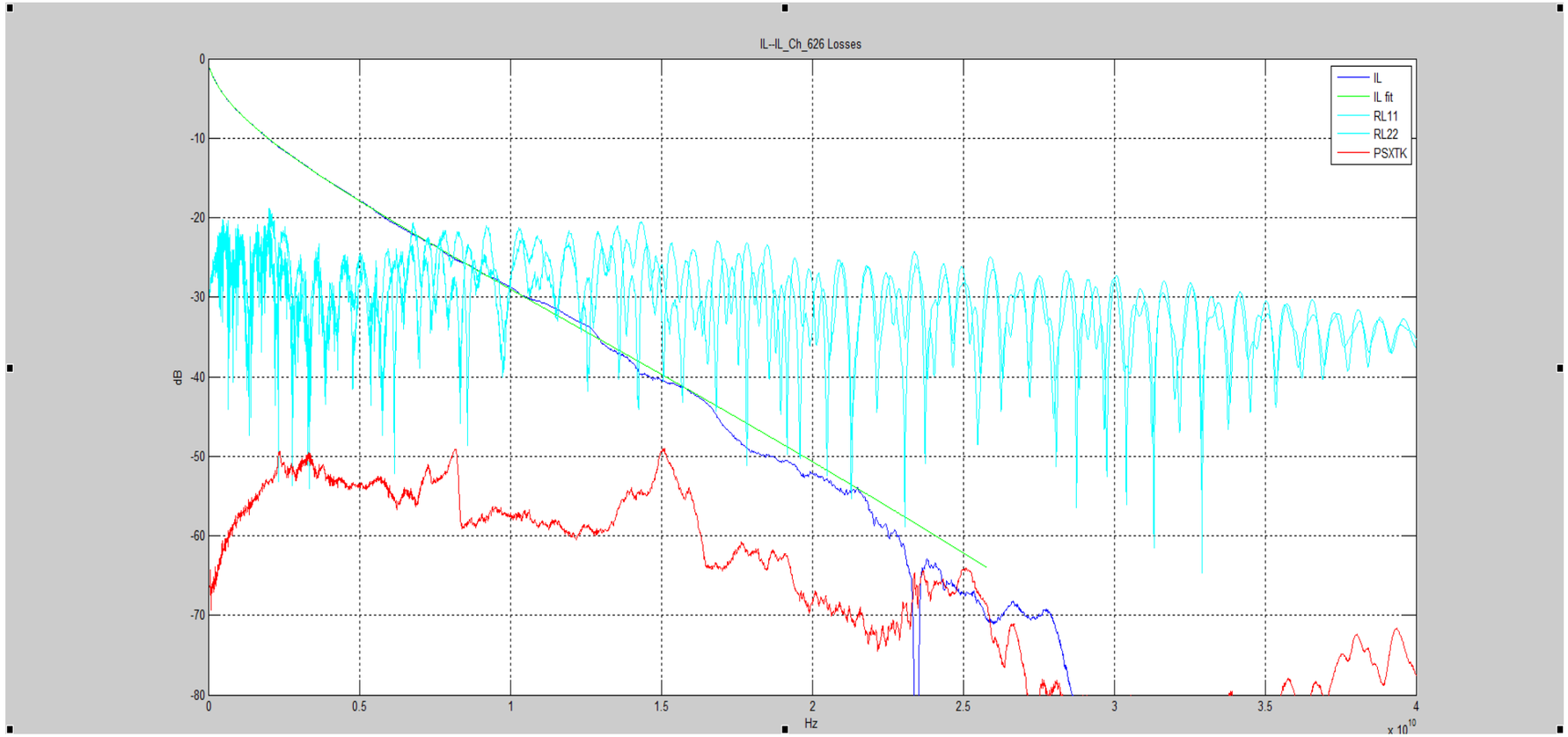
Simulated Stripline: 6.26dB loss at 12.89GHz (6.81dB-1.17dB+0.62dB).

# Cable Data: 5m P2RX0 with test boards




Cable data at: http://www.ieee802.org/3/100GCU/public/channel.html Mark Bugg, Molex

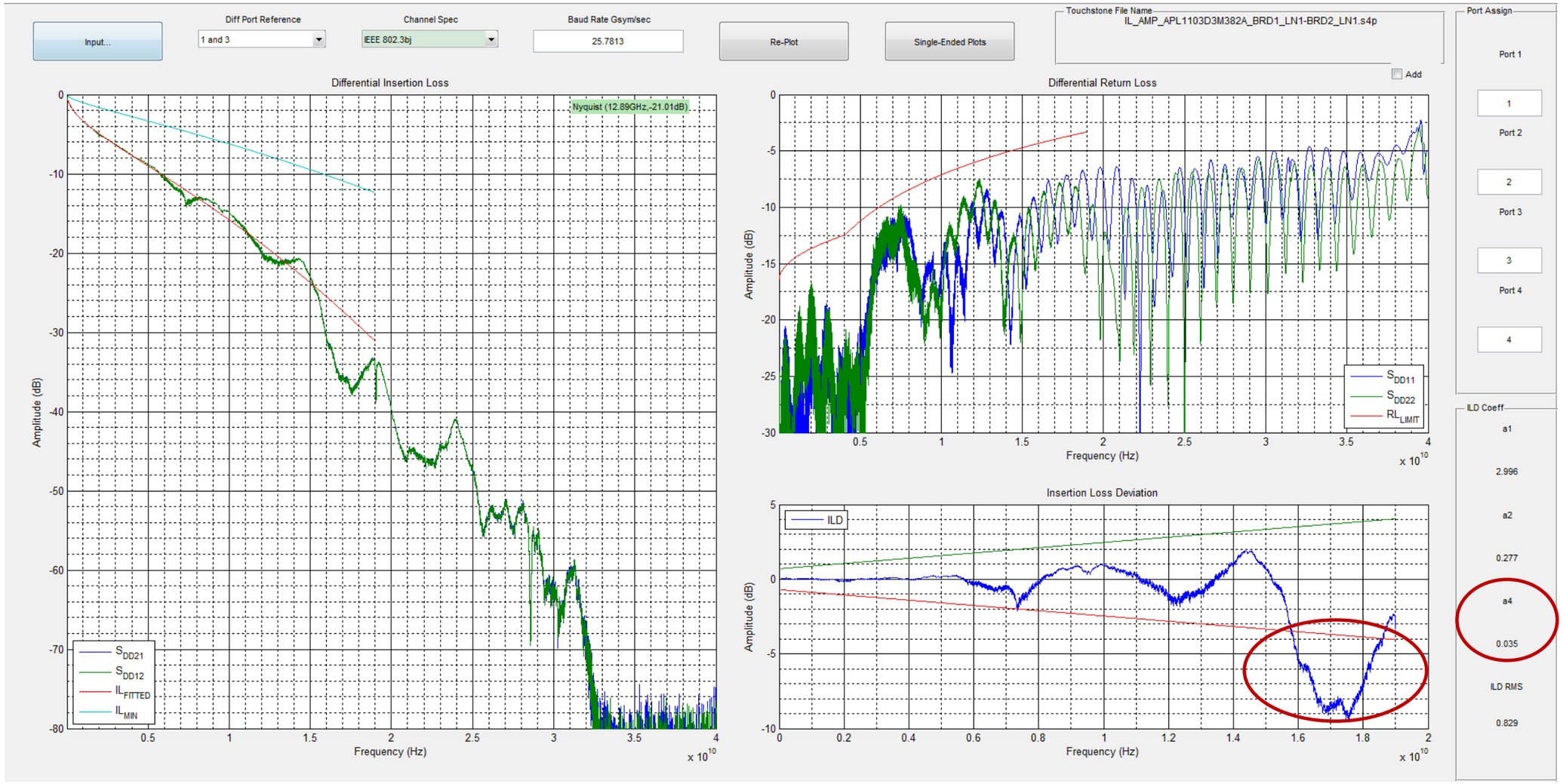
# Channel Data: S-parameters for 5m P2RX0




- COM = 6.34dB Pass
- 3 FEXT aggressors
- 4 NEXT aggressors

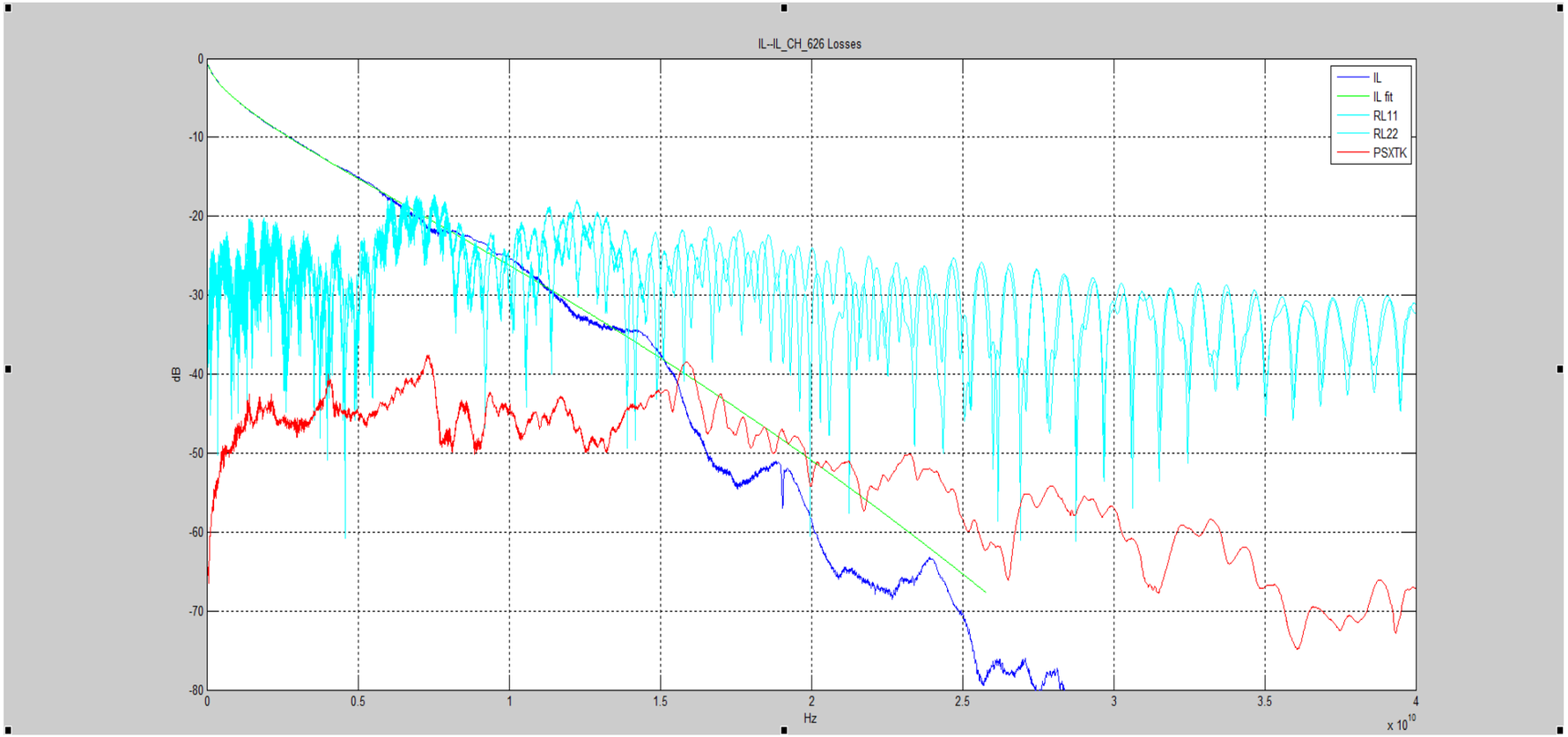
# 4 more examples of failing 802.3bj draft 2.0 spec and passing COM

# Cable Data: Qlogic_Cable_1 with test boards



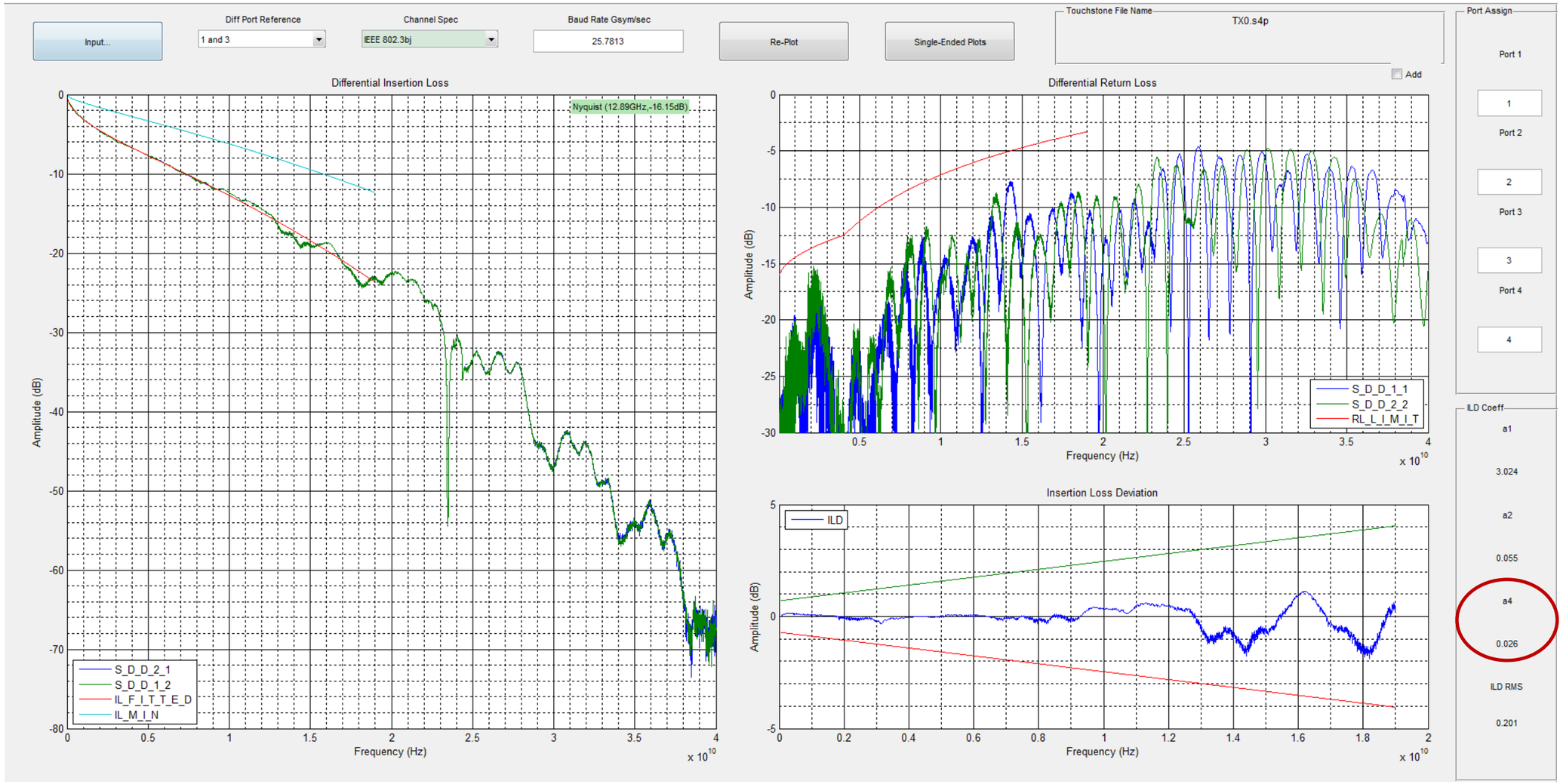

COM = 3.1dB, PASS

# Channel Data: S-parameters for Qlogic_Cable_1



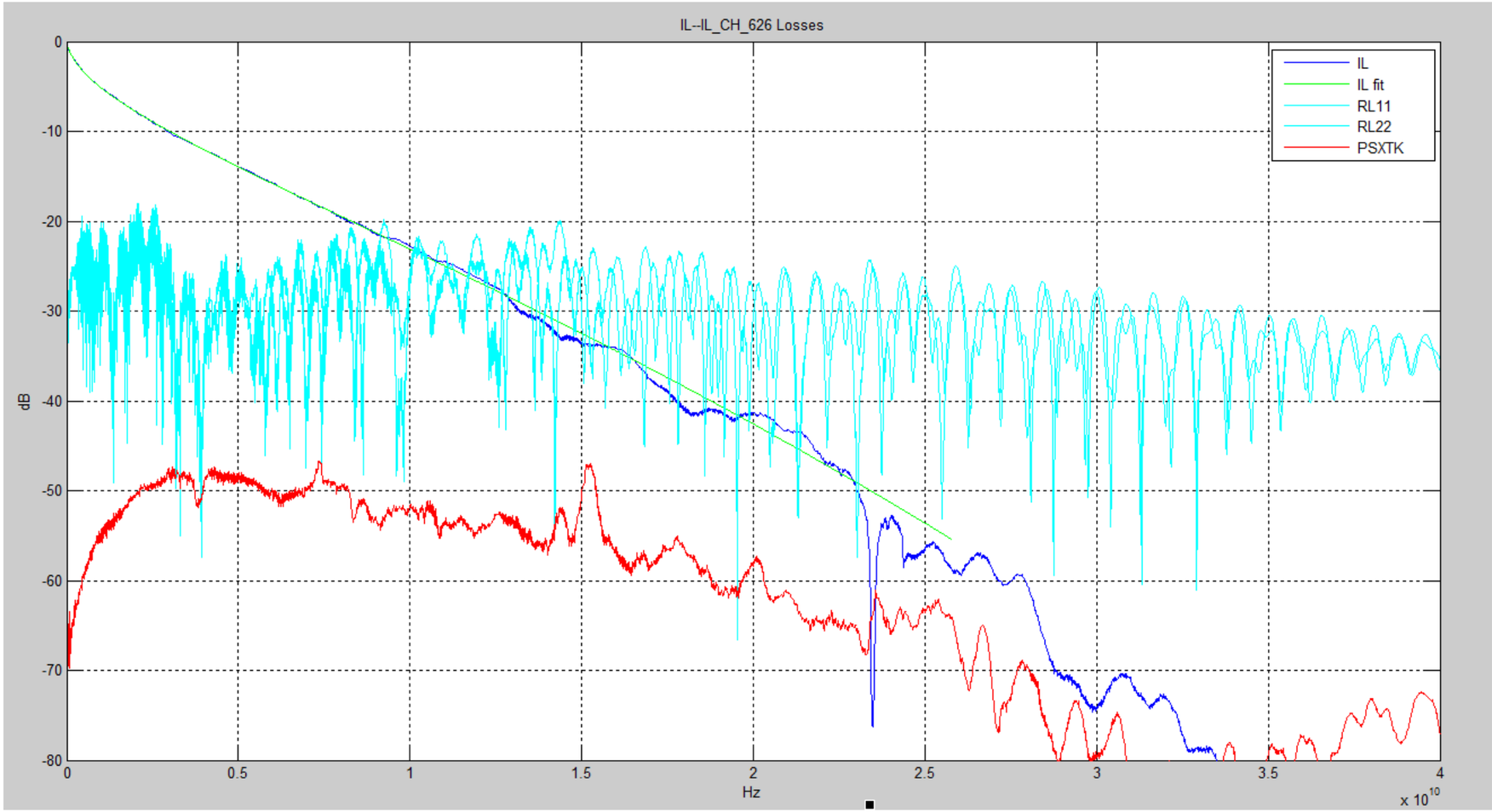

- COM = 3.1dB marginal Pass to 3dB COM spec
- 3 FEXT aggressors
- 4 NEXT aggressors

# Cable Data: 3m P1RX0 with test boards



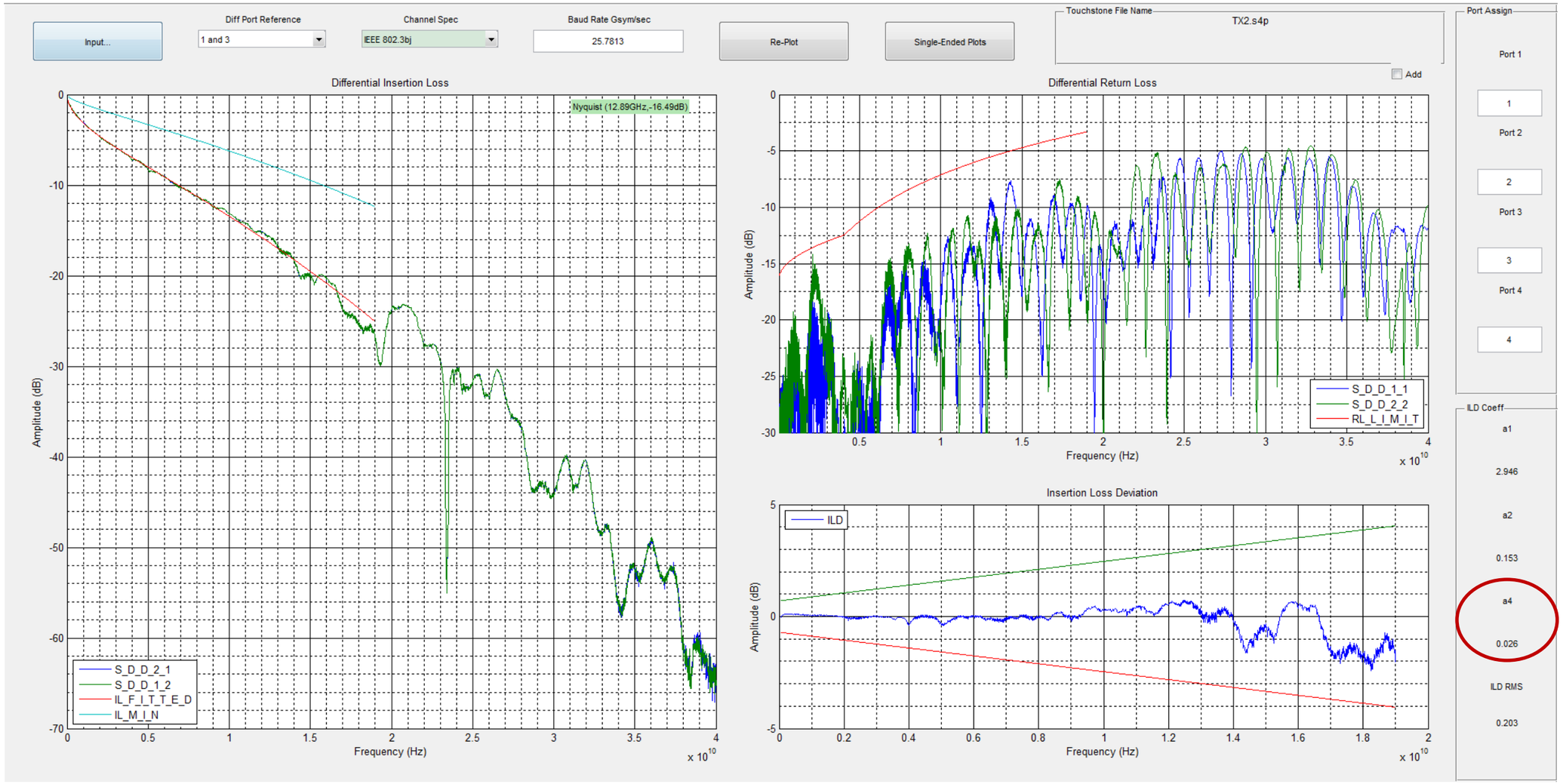

COM = 8.5dB, PASS

# Channel Data: S-parameters for 3m P1RX0



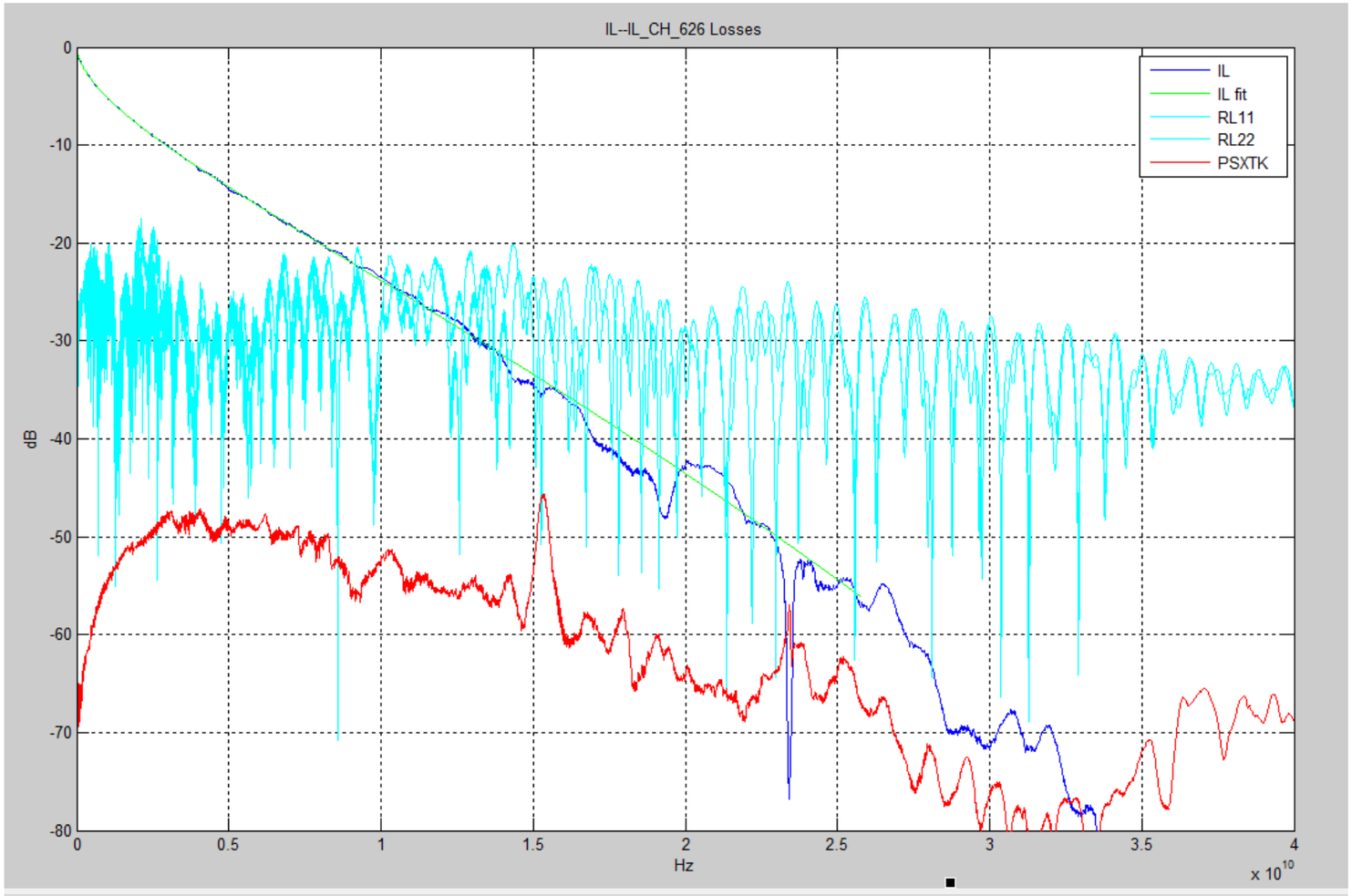

- COM = 8.5dB Pass
- 3 FEXT aggressors
- 4 NEXT aggressors

# Cable Data: 3m P1RX2 with test boards



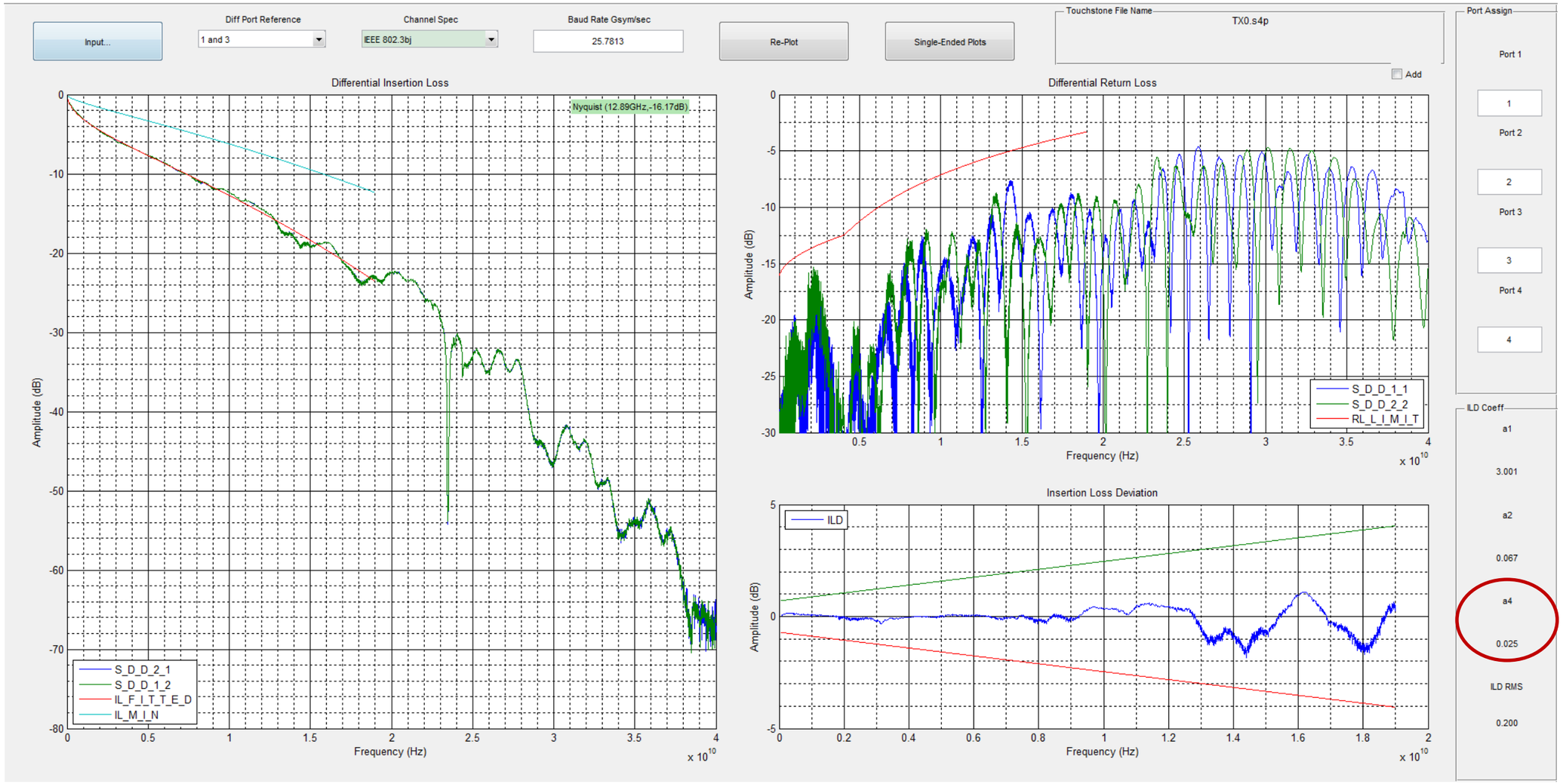

COM = 8.6dB, PASS

# Channel Data: S-parameters for 3m P1RX2



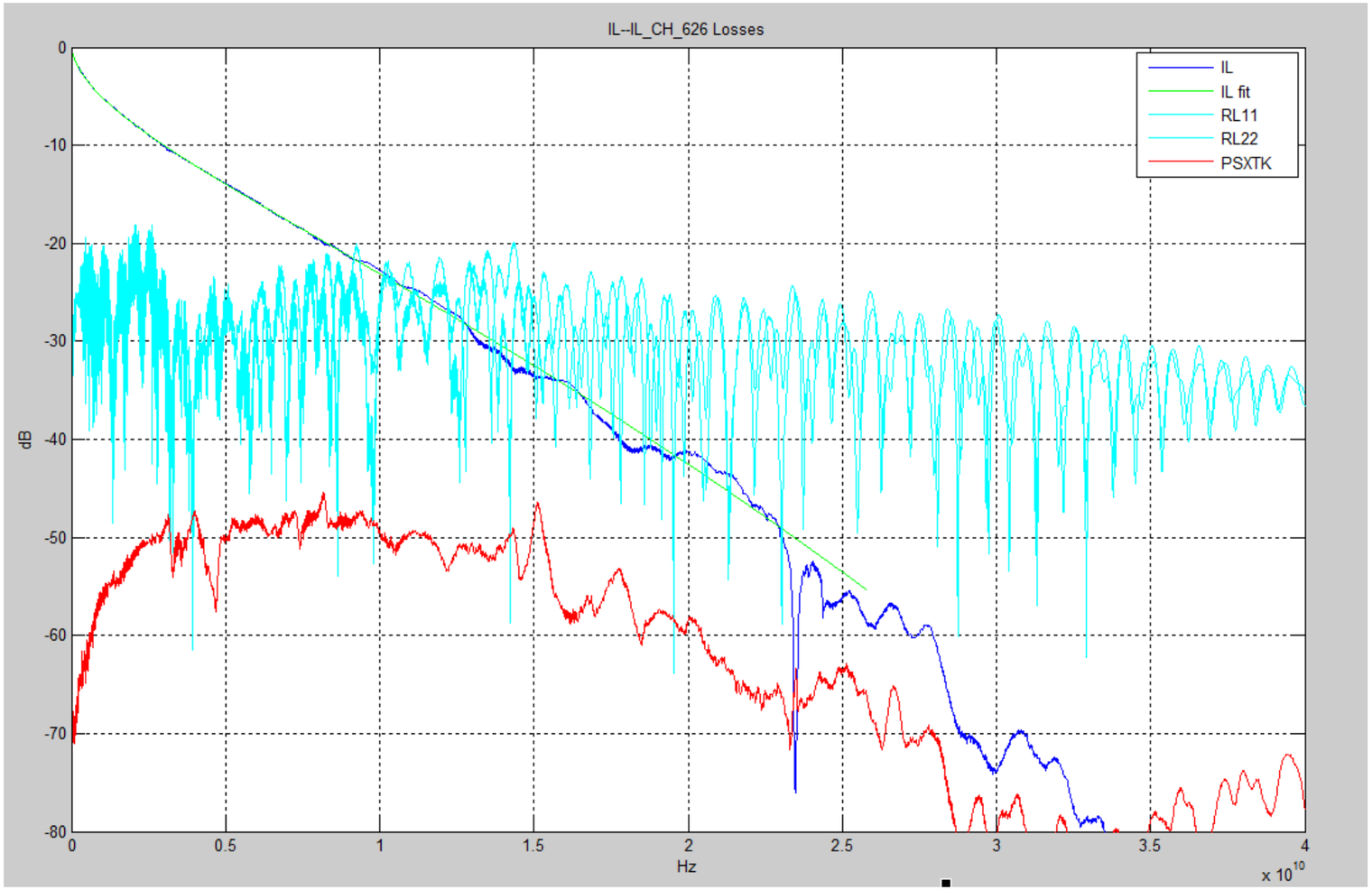

- COM = 8.6dB Pass
- 3 FEXT aggressors
- 4 NEXT aggressors

# Cable Data: 3m P2RX0 with test boards




COM = 8.5dB, PASS

# Channel Data: S-parameters for 3m P2RX0



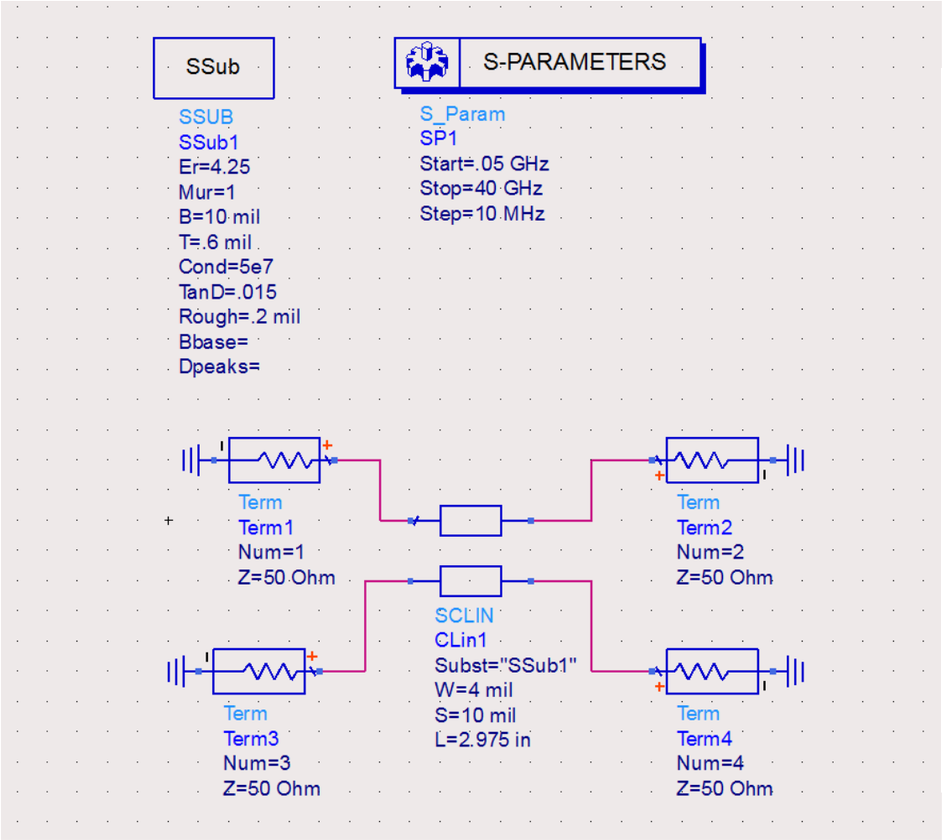

- COM = 8.5dB Pass
- 3 FEXT aggressors
- 4 NEXT aggressors

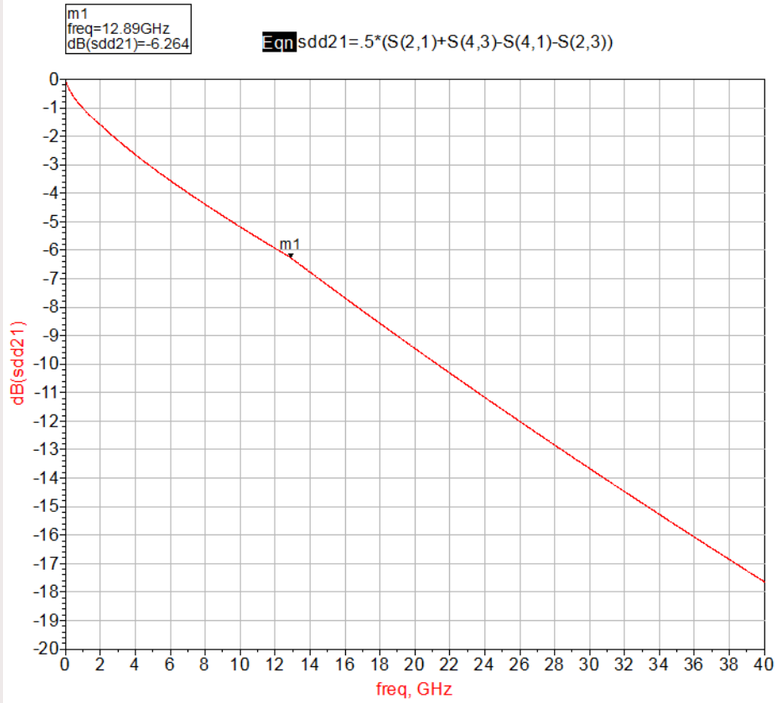
# Conclusions and recommendations

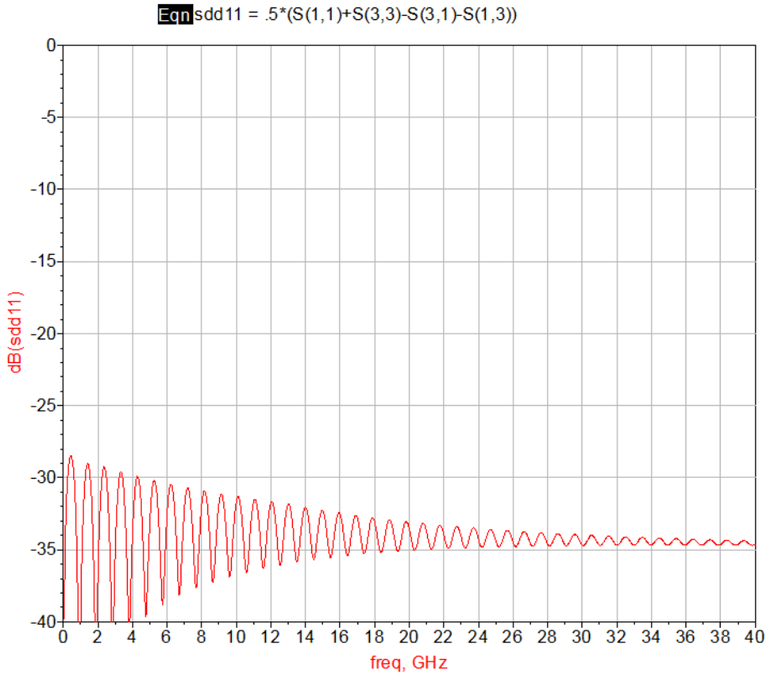
- **The existing 802.3bj cable specifications are failing many cables that have very good system performance.**
- **It would be better to use a specification method that more closely represents system performance.**
- **Replace the specifications for ILD, ICN, and the fitted insertion loss coefficient limits with a single modified COM specification. The COM would be modified by concatenating an extra 6.26dB of PCB loss on each end of the cable. Note that the input data to the COM post-process is the standard cable S parameter files. (IL + 3 FEXT + 4 NEXT)**
- **To take account of the fact that the host PCB will not be as well controlled as the additional PCB loss in the code require 1dB additional COM compared to the pass/fail limit for clause 93.**

# Backup

# Simulated Stripline



# S-parameter Cascade to achieve full Channel for Comm.