1000BASE-T1 PHY Performance with MDI Return Loss relaxed

Atlanta, GA
Jan 18, 2016

Ahmad Chini, Mehdi Kilani, Mehmet Tazebay

Broadcom Corporation

Foreword

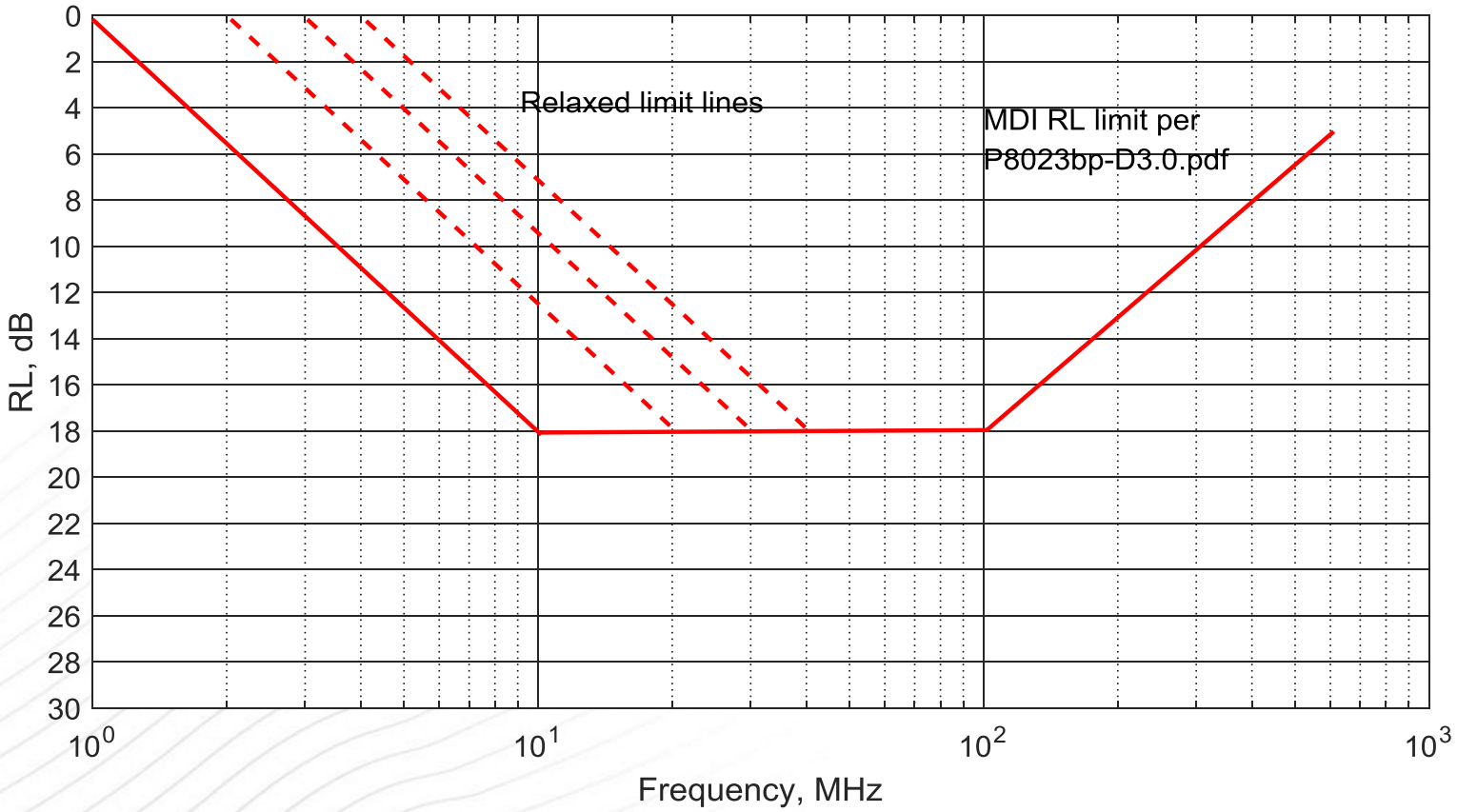
- MDI RL limit line proposed in pan_3bp_01_0115.pdf was adopted earlier for 1000BASE-T1.

- It is suggested that the limit line be relaxed to allow for smaller size inductors.

- The effect of relaxing MDI RL on PHY performance needs to be considered.

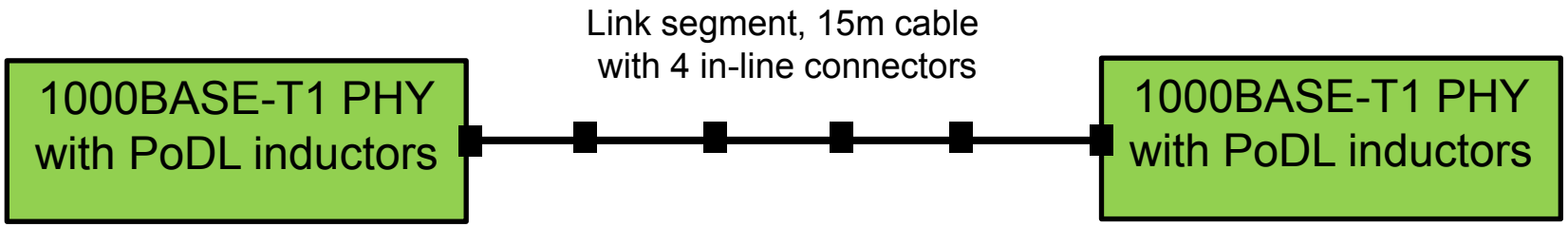
- This document reports PHY performance degradation in MSE when MDI RL is relaxed.

Relaxed MDI RL limits (?)



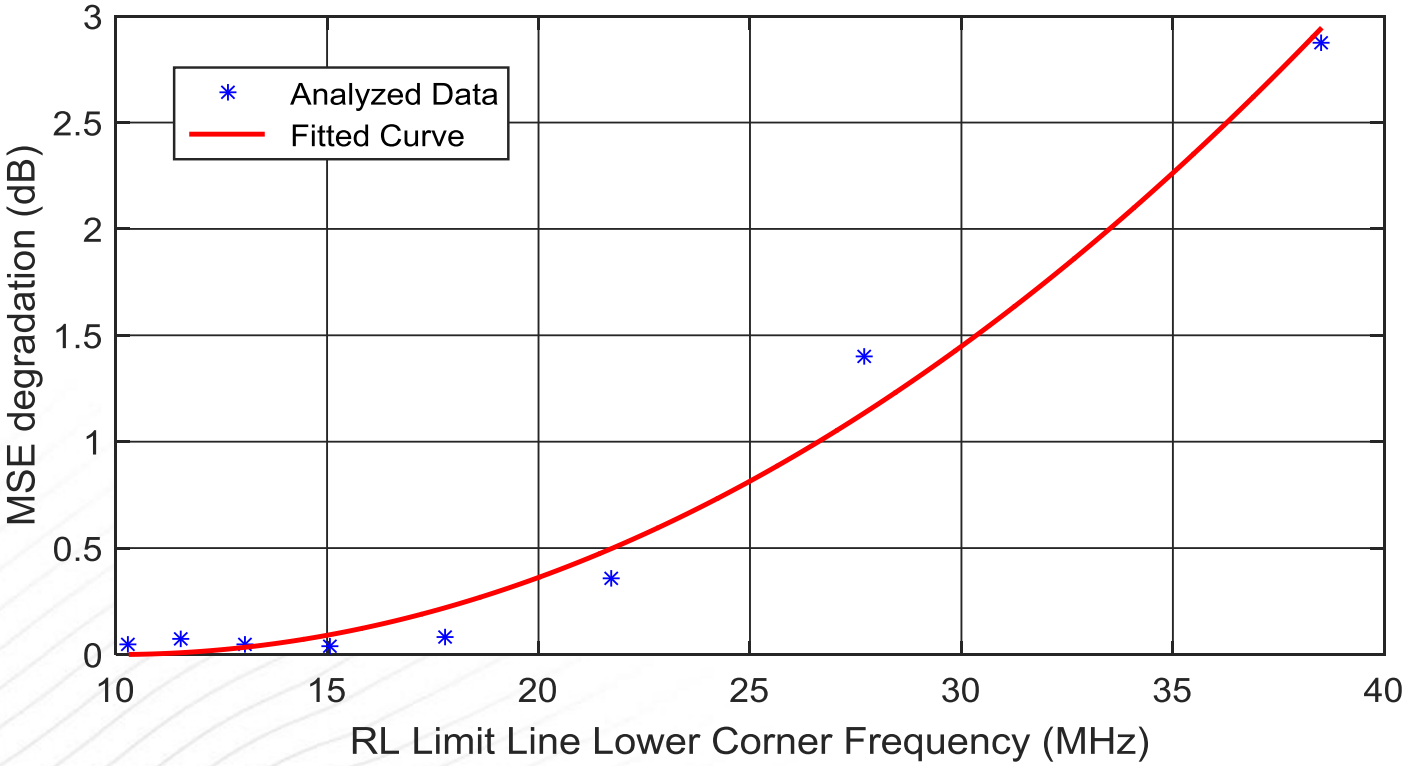
- Relaxing lower corner frequency of the MDI RL limit line allows smaller and more practical inductors for PoDL.

MMSE performance analysis with PoDL inductors



- MMSE analysis performed considering various inductor sizes for PoDL.
- MSE recorded along with MDI RL.
- MSE degradation was calculated when RL crossed -18dB level at 10MHz to 40MHz frequency range.

MSE degradation with relaxed limit lines



- Degradation in MSE is shown as compared to 10MHz corner frequency defined in P8023bp-D3.0.pdf. For the assumed parameters, MSE for 10MHz corner frequency is about -34dB.

Summary

- PoDL inductor size is reduced and becomes more practical with relaxation of RL limit line.
- Relaxing RL limit line degrades PHY performance by about 3dB when the lower corner frequency is at 40MHz.
- Degradation in PHY performance is reasonable (less than 0.5dB at MSE of about -34dB) with limit line corner frequency not exceeding 20MHz.