RTPGE Technical Feasibility Study of PHY and Cabling System

IEEE 802.3 RTPGE Study Group

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Outline

- Test setups – 6 connector (4 inline+2 equipment)/15m

- Alien Crosstalk

- IL and RL

- Balance Property

- PHY Margin results

- Conclusions & Support of RTPGE Objectives

Test Setups

Equipment Connector

Inline Connector

7

3m

7

3m

7

3m

7

3m

7

3m

7

3m

Equipment Connector
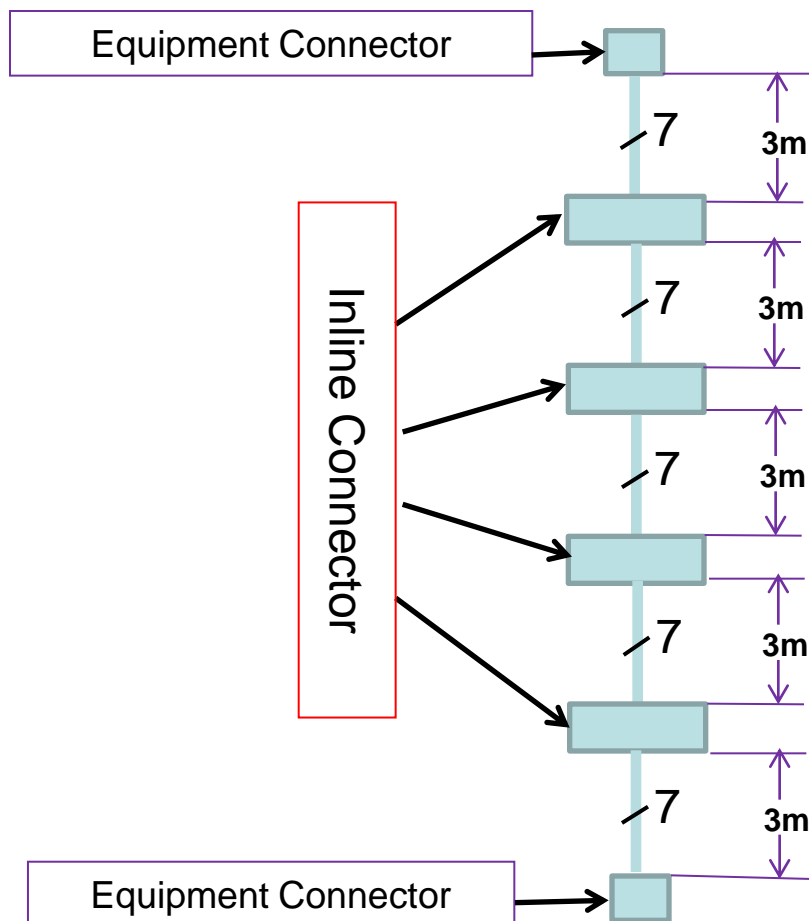
- Existing 1-pair Automotive Cabling
  – 15m, 6 connections
- Prototype 1-pair Cabling
  – 15m, 6 connections

Note: Due to material shortage, 2-pair cabling system and 40m 6-A-1 channels were not tested this time
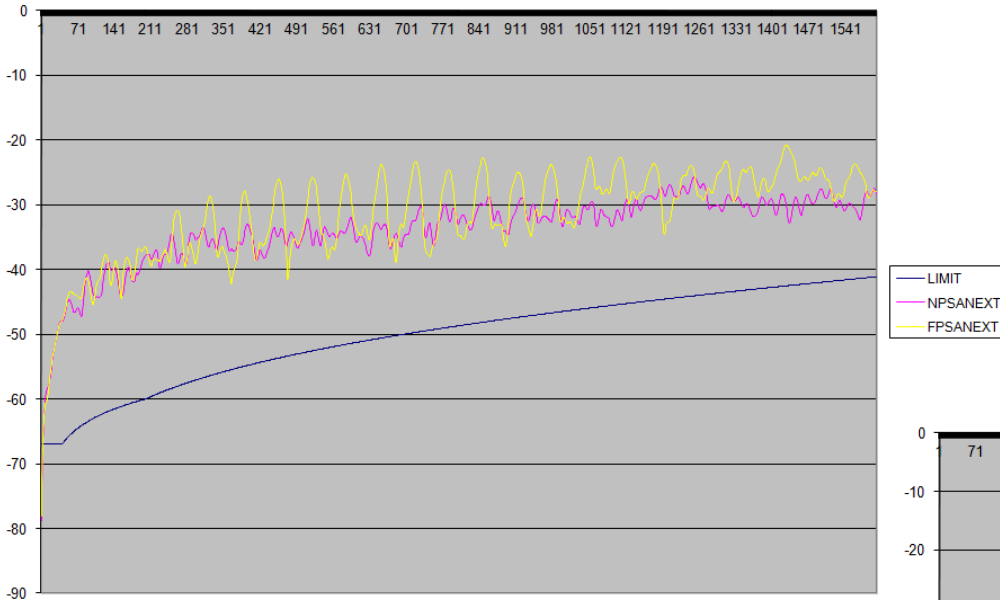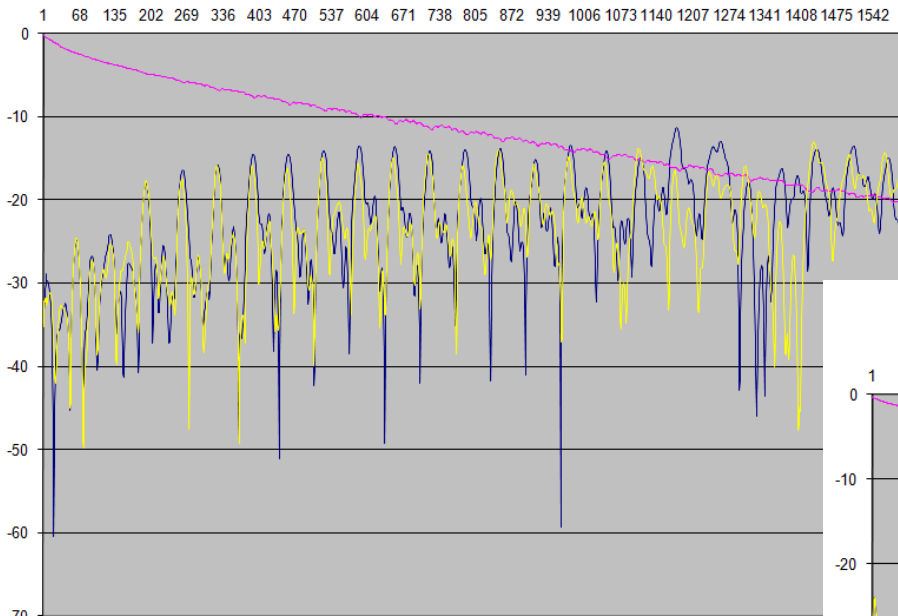
Alien Crosstalk
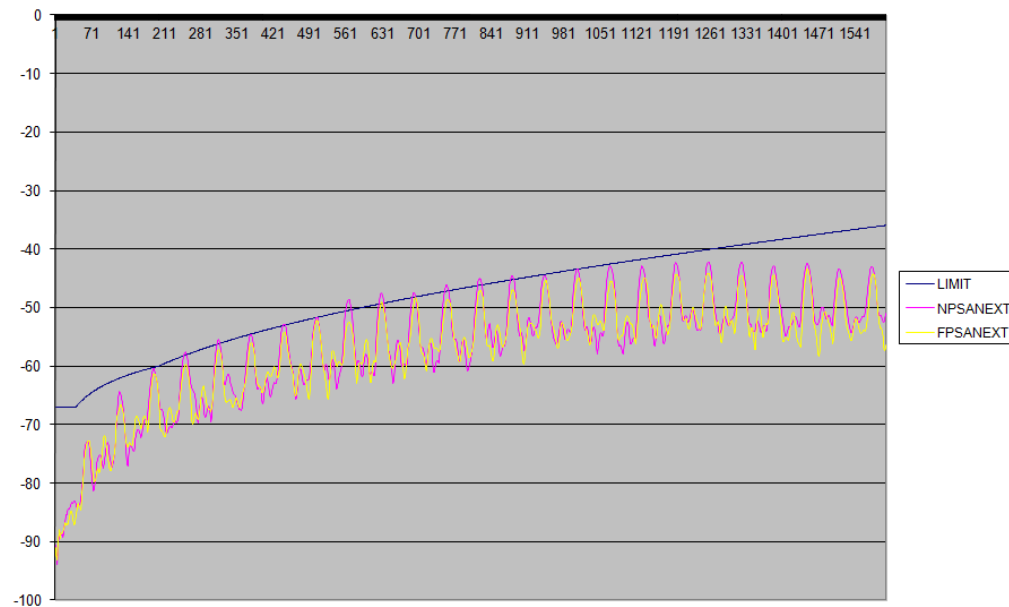
Existing 1-pair Automotive Cabling

Prototype 1-pair Cabling

IL & RL

Existing 1-pair Automotive Cabling
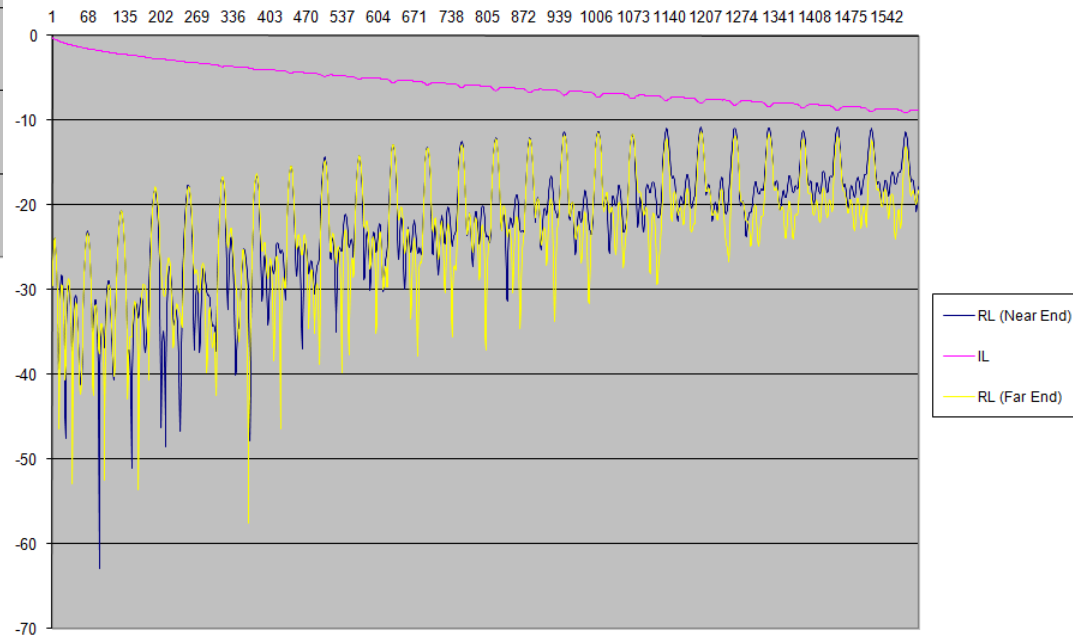
Prototype 1-pair Cabling

Balance Property

Test setup

Flexray or Commscope cable

PHY1 100BASE-TX PHY2

3m

Chamber

Both devices transmit randomly sized Ethernet frames

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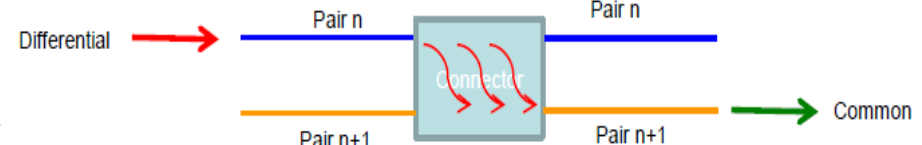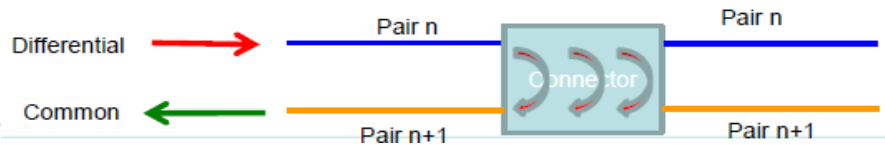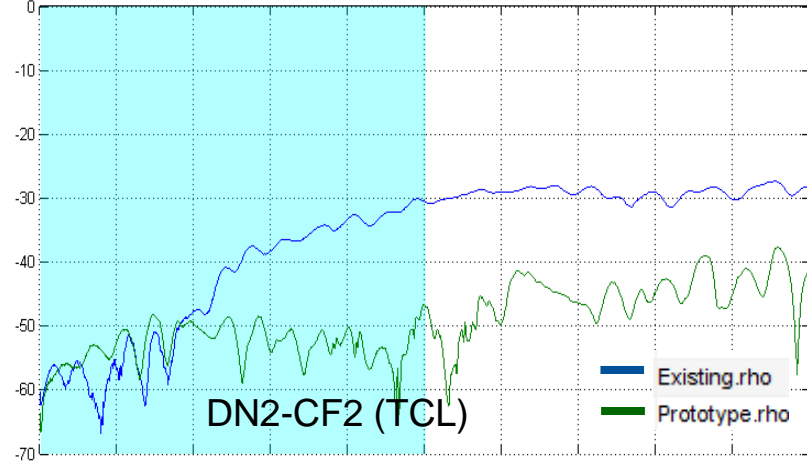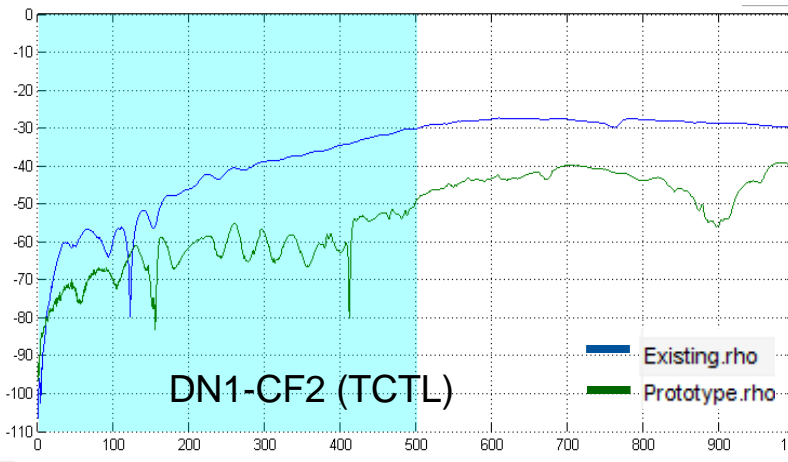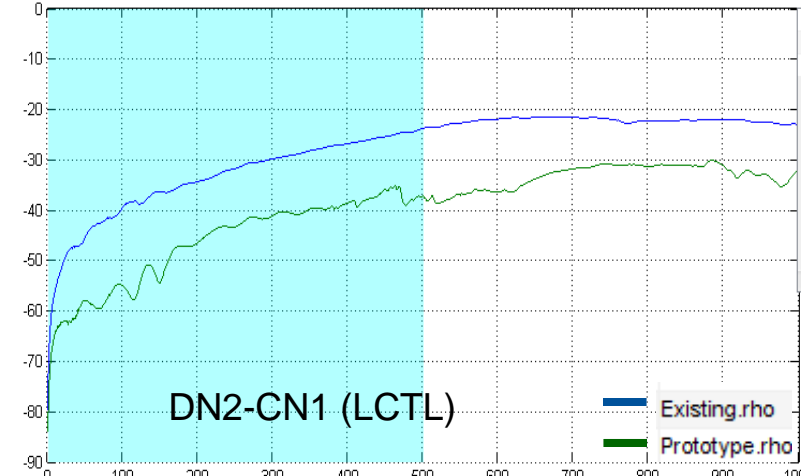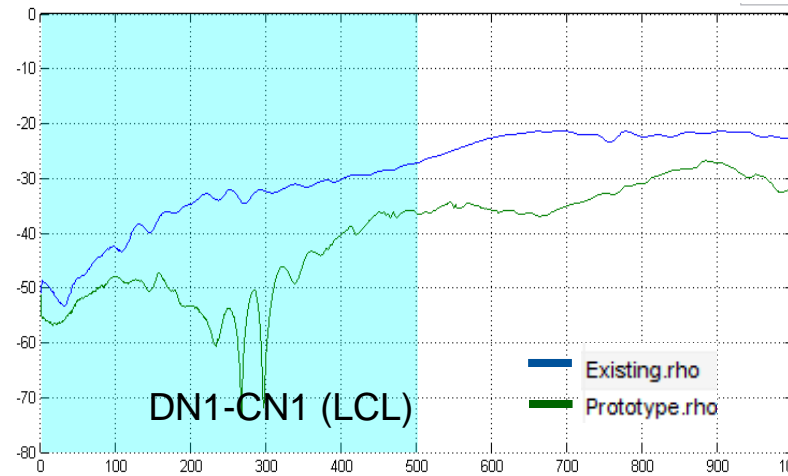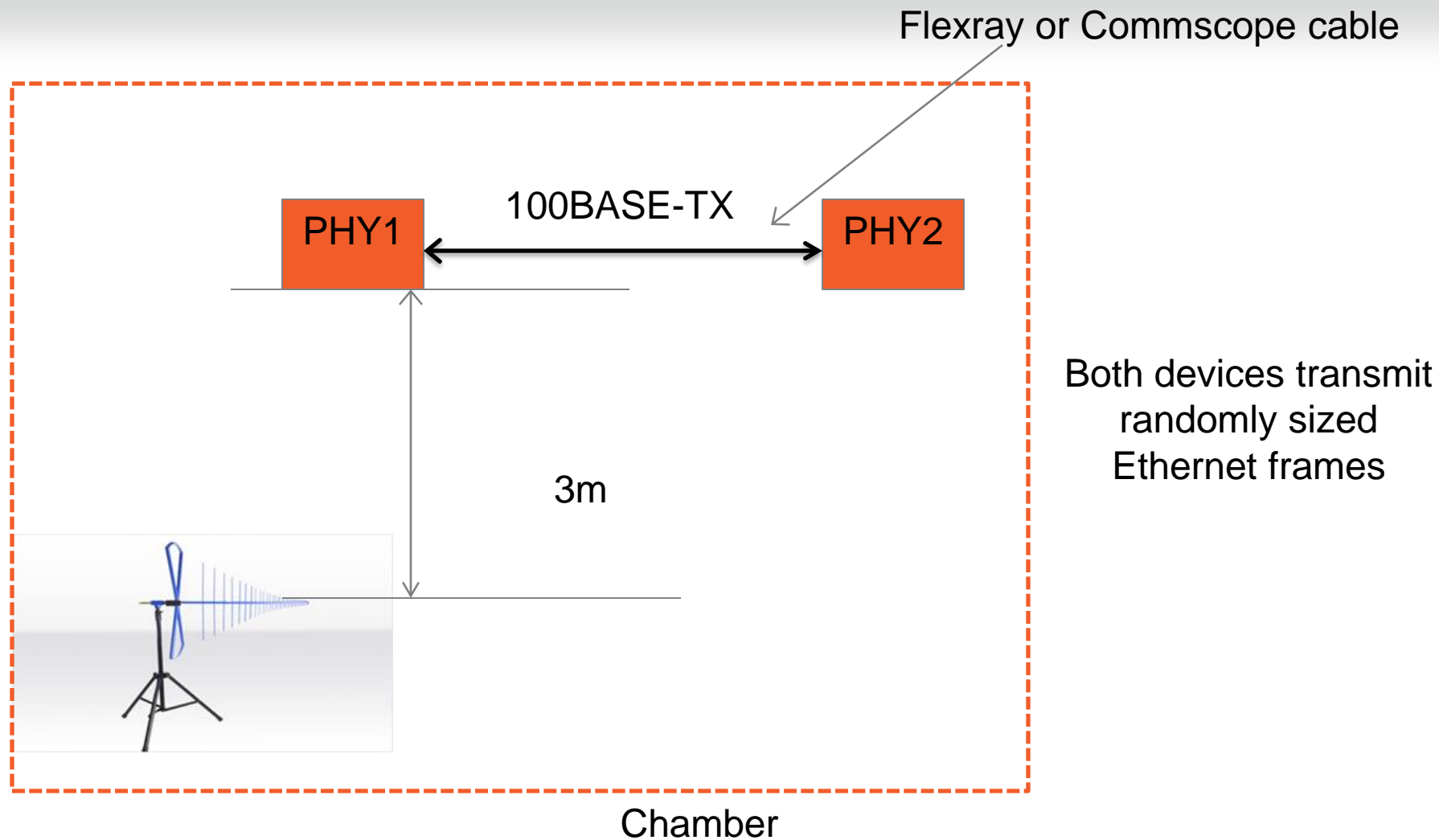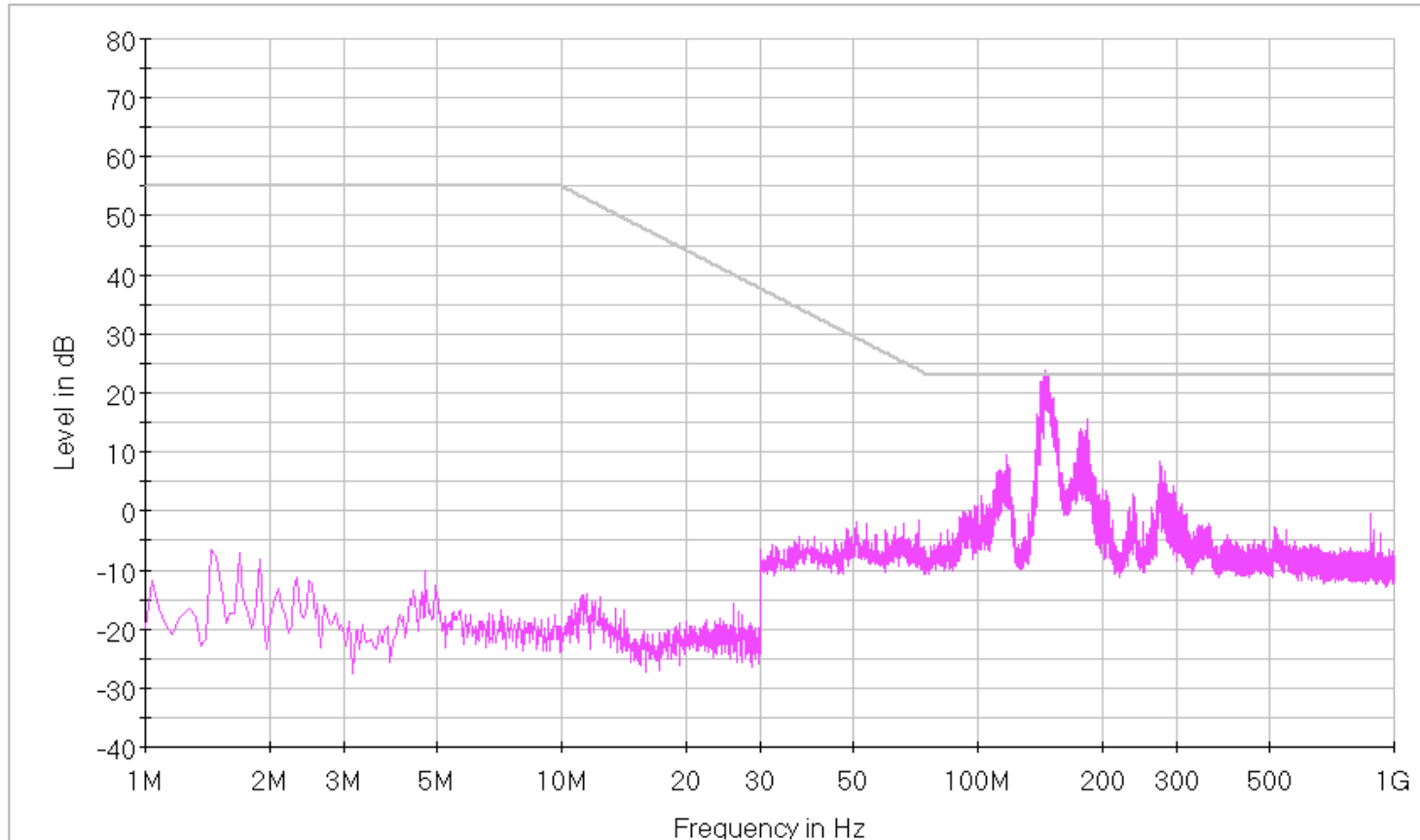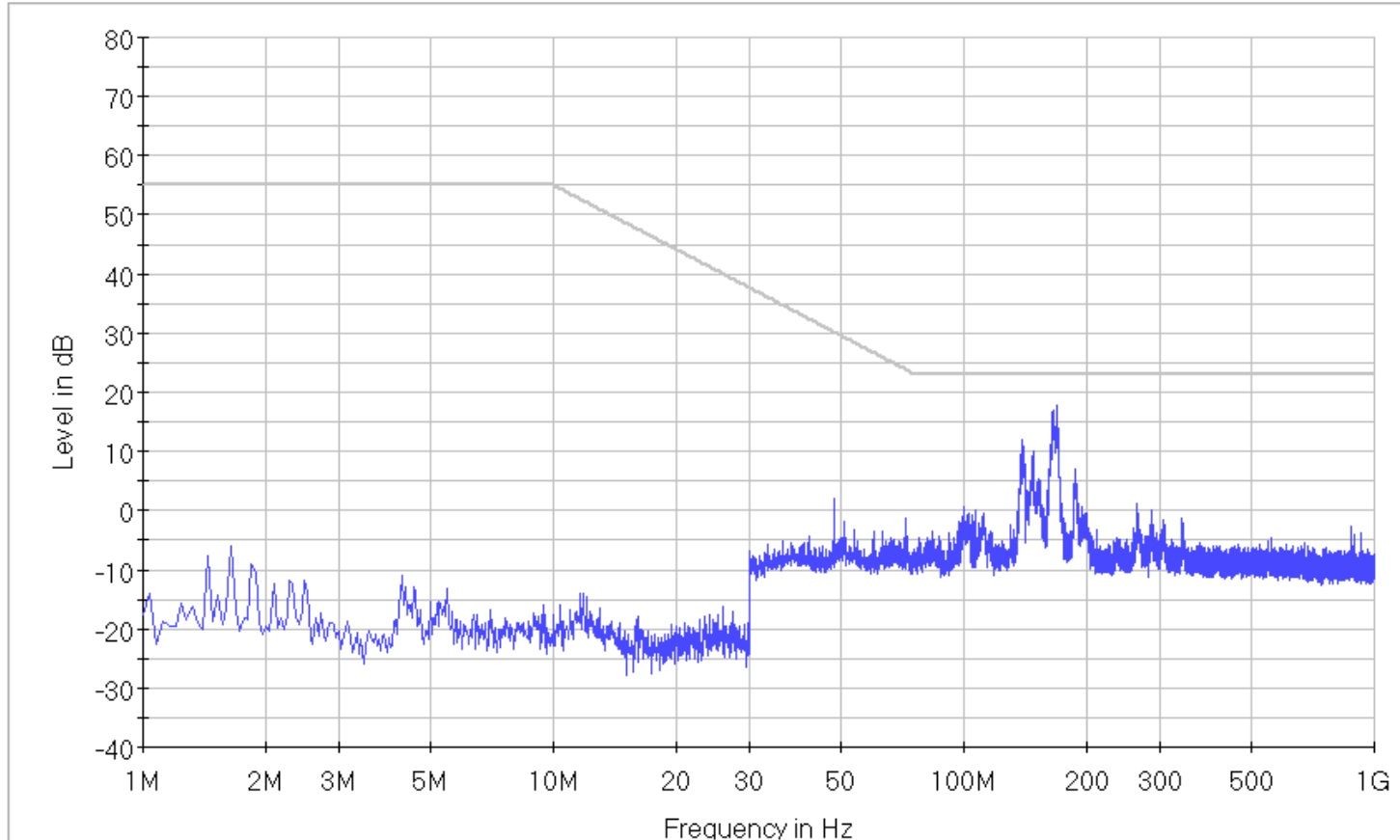
Radiated Emission Measurement

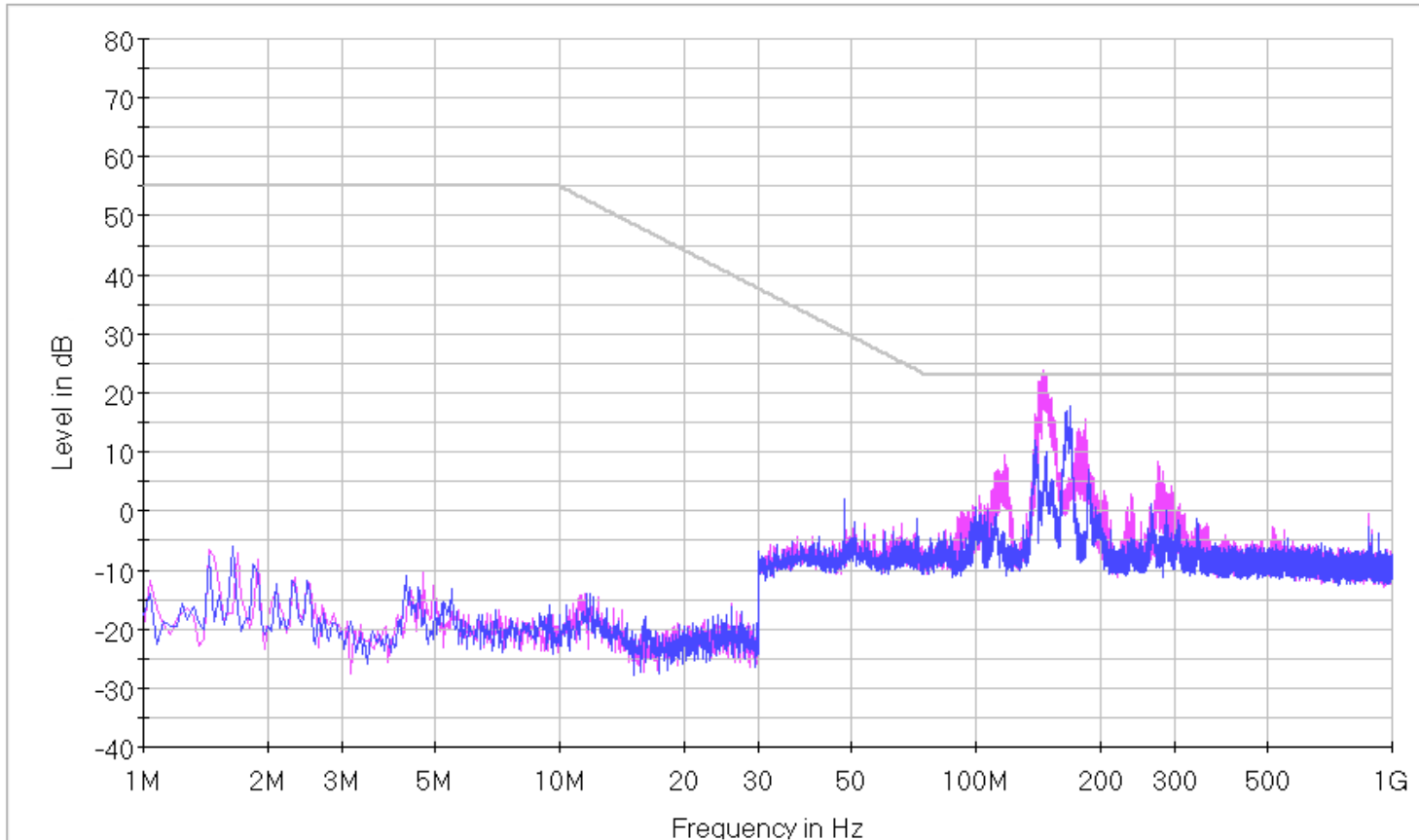• 100BaseT Over FlexRay Cable with MQS Connector

8

Radiated Emission Measurement

• 100BaseT Over CommScope Cable

Radiated Emission Measurement

• 100BaseT Over CommScope and FlexRay Cable Comparison

Summary

- Contribution is offered in support of technical feasibility for a long reach channel objective on improved balance cabling
- Long reach channel definition requires comparison of improved cabling to existing automotive cabling
  - Test setup – Flexray cabling vs. Commscope cabling
  - Measurements of balance, return loss, Alien crosstalk
- Data suggests:
  - Insertion loss improvement of ~ 70%
  - > 10dB balance improvements (10dB EMI suppression)
  - >20dB alien crosstalk improvements are technically feasible
- PHY measurements support emissions from 100BASE-TX transceivers meet EM mask with margin for greater bandwidth
- Similar complexity PHYs should be able to reach
  - 15 meters on channels meeting existing Flexray specifications
  - At least 40 meters on channels with at least 10dB improved balance and 20dB improved alien crosstalk measurements

Thank You

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