

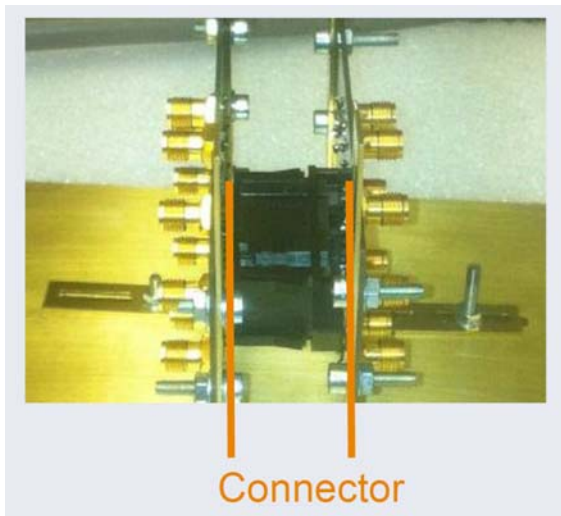
Analysis of Connector S-parameters for 10SPE

Eric DiBiaso, Bert Bergner
TE Connectivity

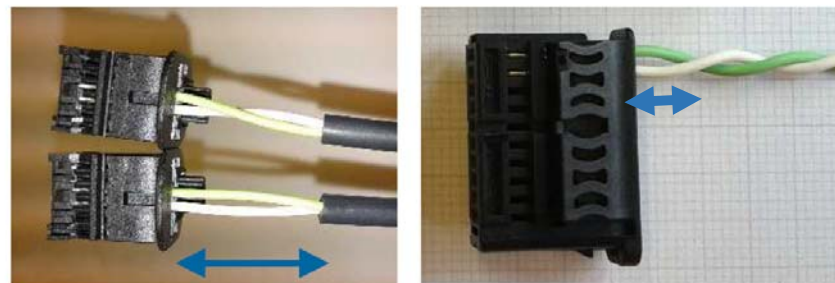
March 14, 2017 – Plenary Meeting – Vancouver, BC

Connector Measurement Setup according to “OPEN Alliance BroadR-Reach[®] Definitions for Communication Channel”, Version 2.0 [1]

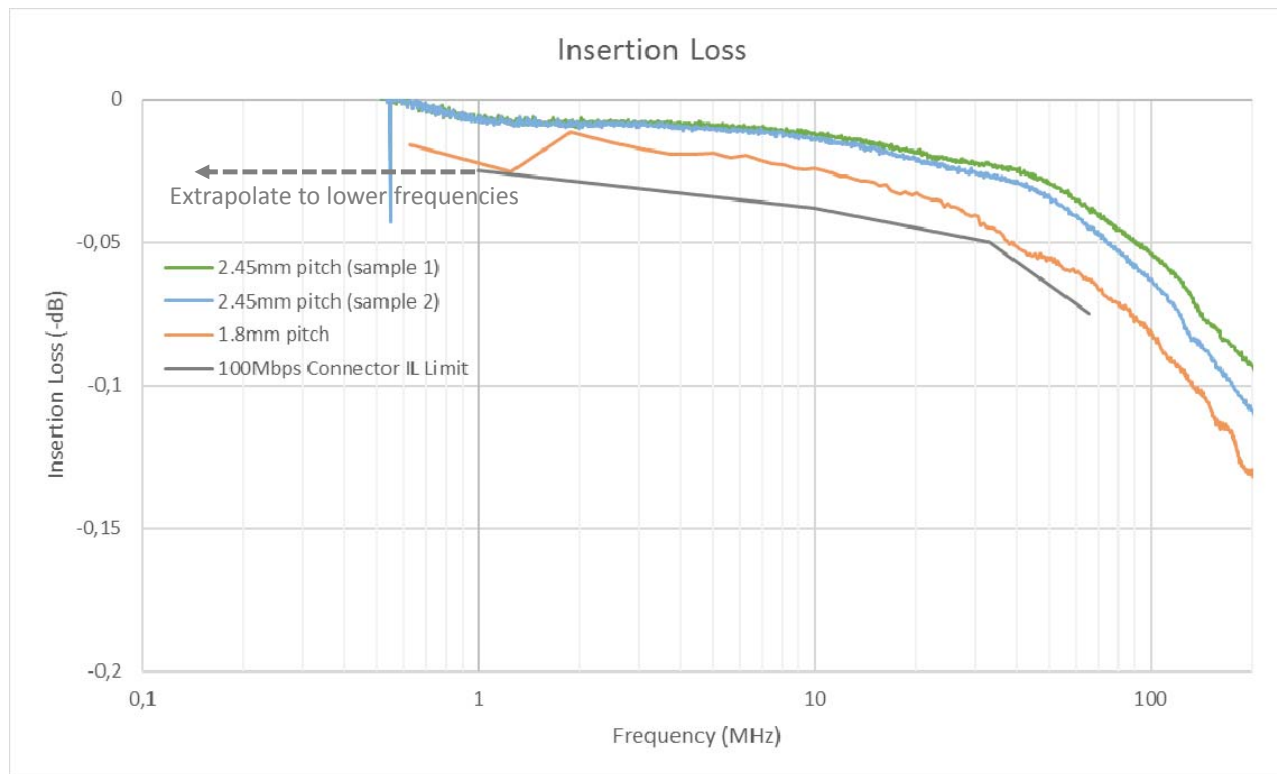
- Connectors are to be measured without the “untwist length” according to [1]
- The effect of the untwist length is included in the channel requirements



Untwist Length:

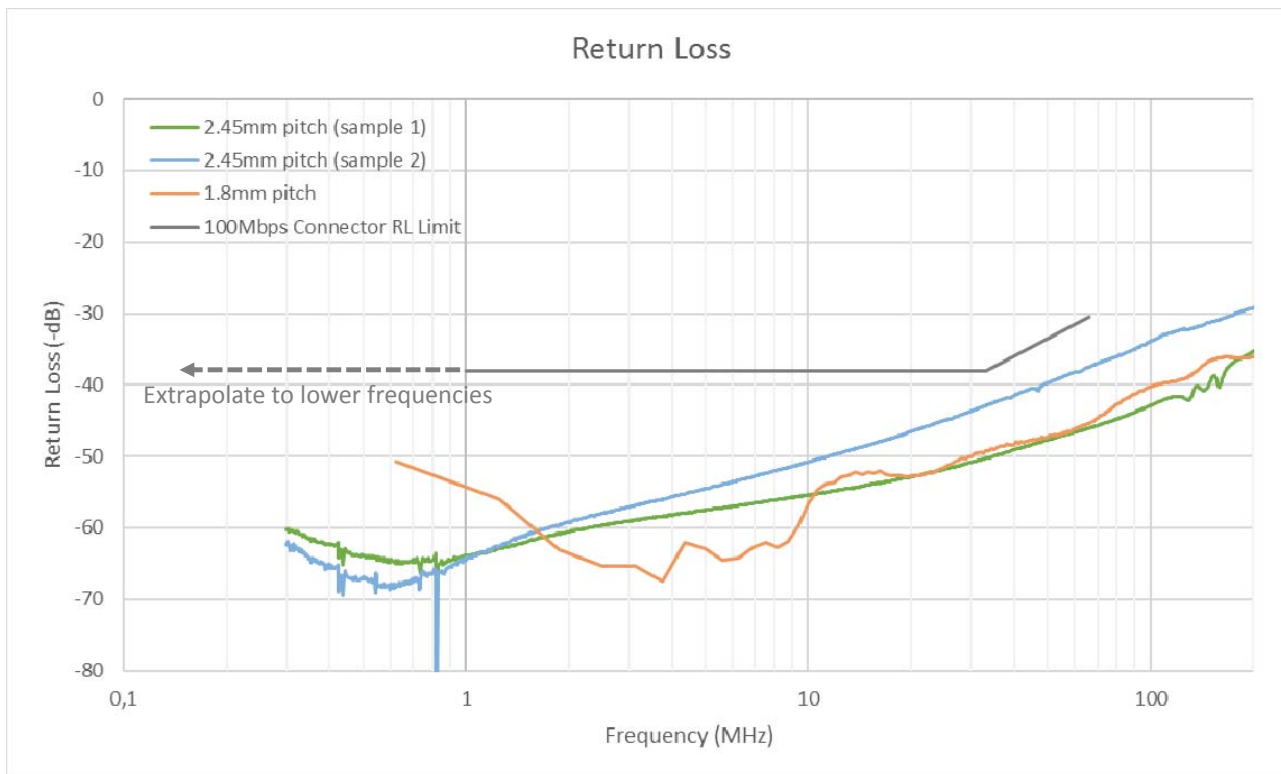


Insertion Loss of Automotive Standard Terminal Connectors



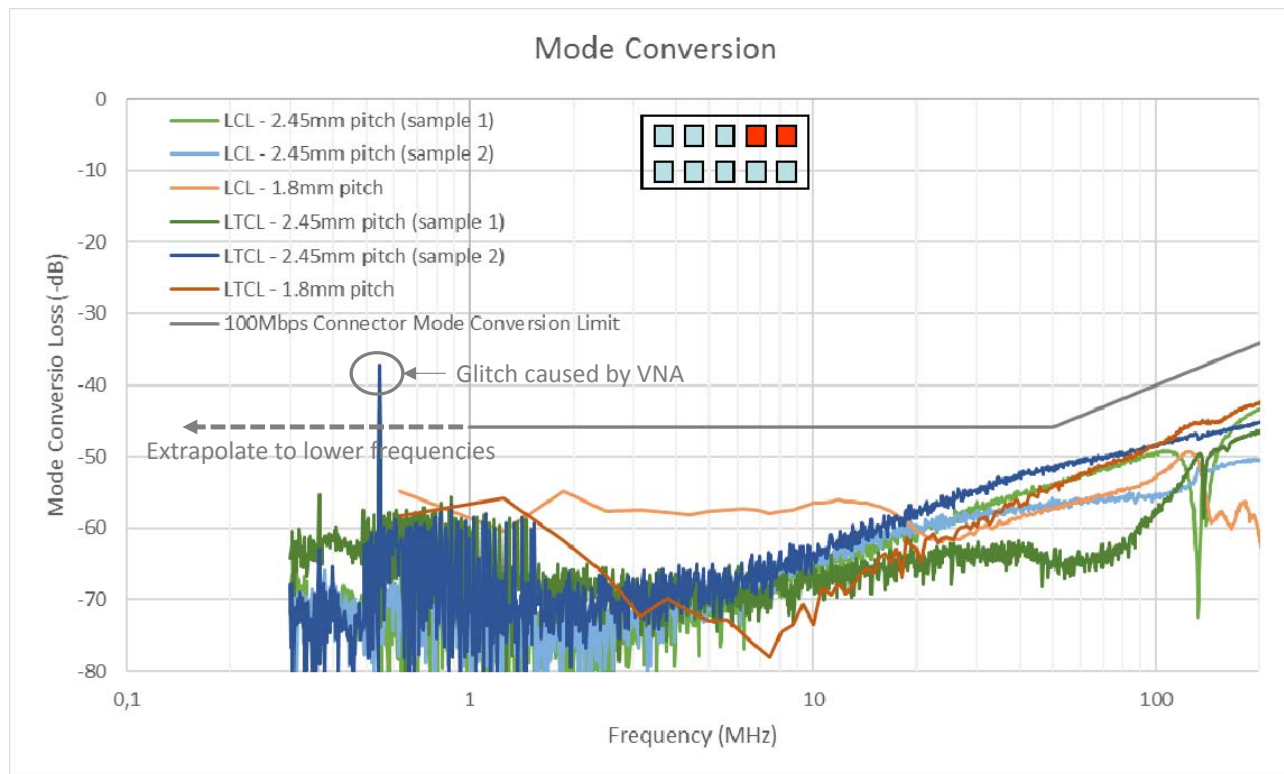
- Accuracy at low frequencies strongly depends on VNA type, calibration, and VNA settings
- Propose to extend 100Mbps connector limit towards lower frequencies with constant value

Return Loss of Automotive Standard Terminal Connectors



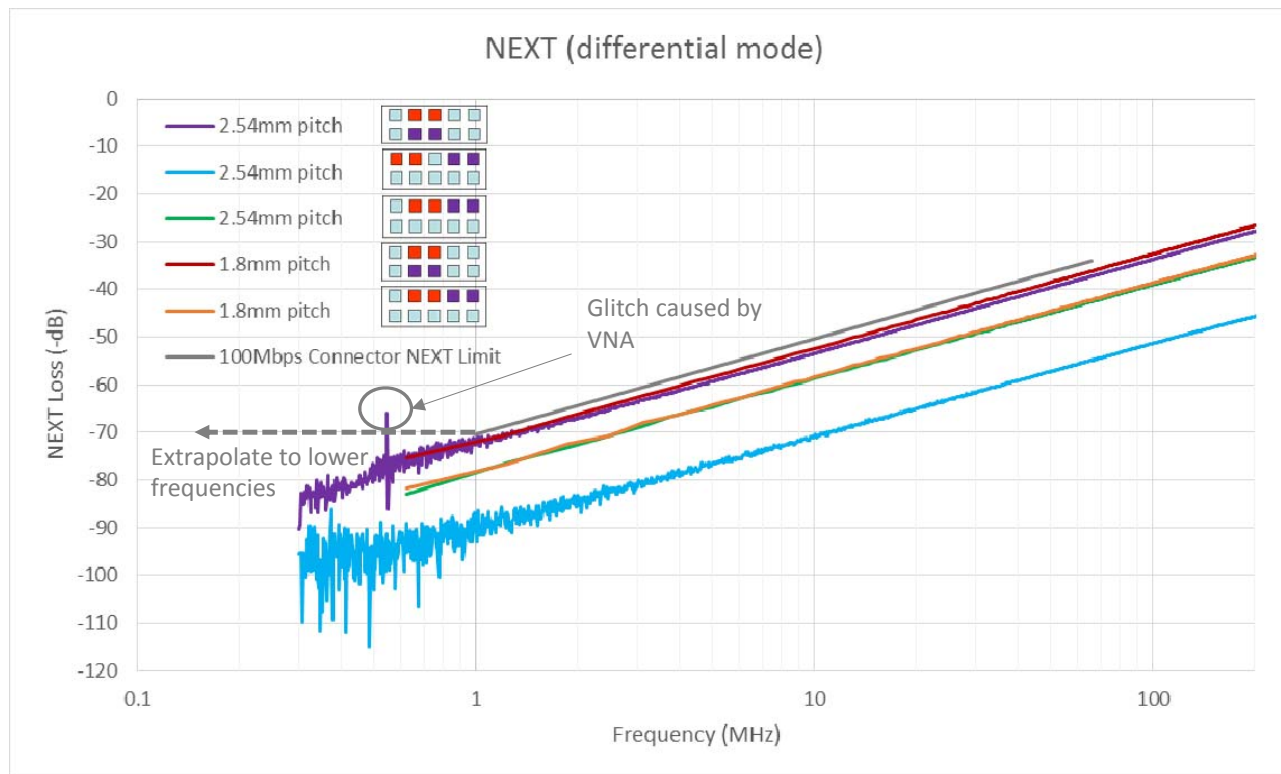
- Accuracy at low frequencies strongly depends on VNA type, calibration, and VNA settings
- Propose to extend 100Mbps connector limit towards lower frequencies with constant value

Mode Conversion of Automotive Standard Terminal Connectors



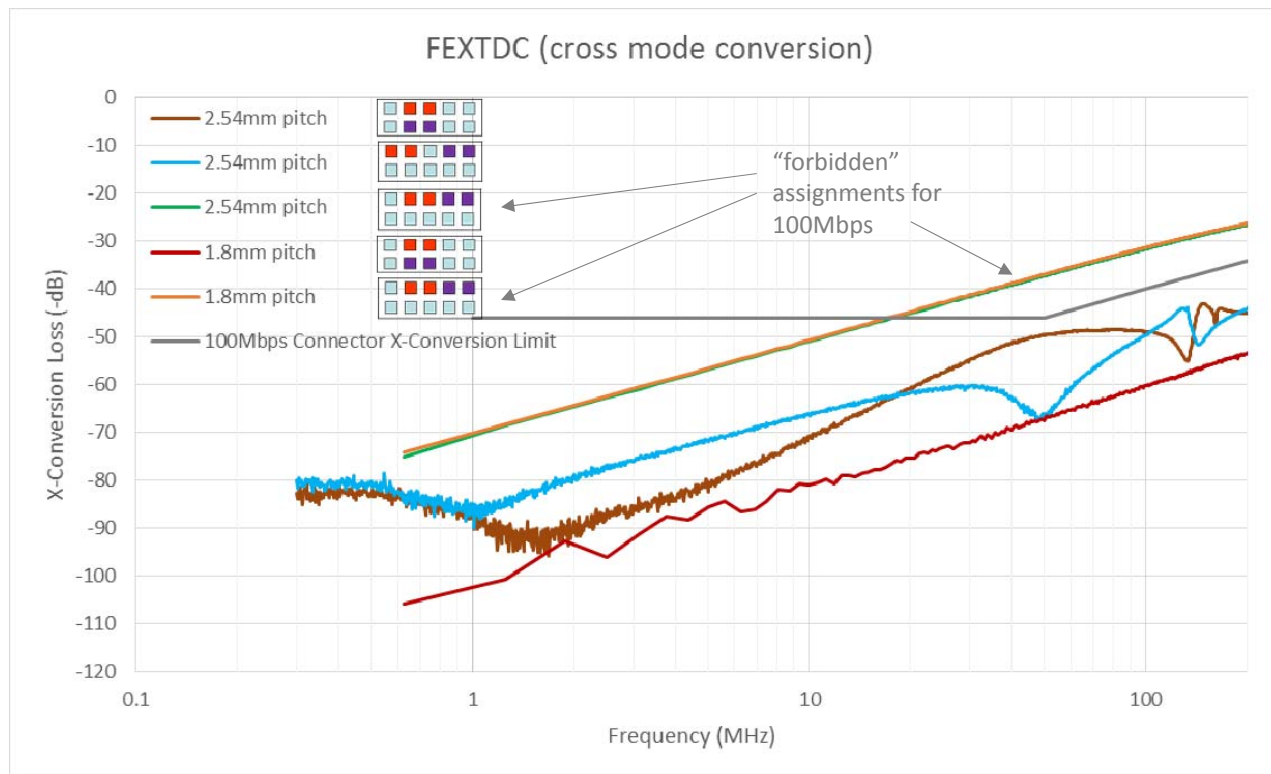
- Accuracy at low frequencies strongly depends on VNA type, calibration, and VNA settings
- Glitches possible depending on the individual equipment type and/or setting – This has nothing to do with the DUT!
- Propose to extend 100Mbps connector limit towards lower frequencies with constant value

Cross Talk of Automotive Standard Terminal Connectors



- Accuracy at low frequencies strongly depends on VNA type, calibration, and VNA settings
- Glitches possible depending on the individual equipment type and/or setting – This has nothing to do with the DUT!
- Increased noise for very low values
- Propose to extend 100Mbps connector limit towards lower frequencies with constant value

Cross Conversion of Automotive Standard Terminal Connectors



- Accuracy at low frequencies strongly depends on VNA type, calibration and VNA setting
- Possibility for increased port density for 10Mbps if limit can be relaxed compared to 100Mbps application

Conclusion

- Connectors are “lumped” elements for low frequencies
- Signal integrity values can be interpolated towards lower frequencies
- Measurement accuracy for low values is limited by many factors
- Possibility to increase port density if requirements on cross talk & cross mode conversion at higher frequencies can be relaxed from the 100Base-T1 limits.

Thank You!!!