

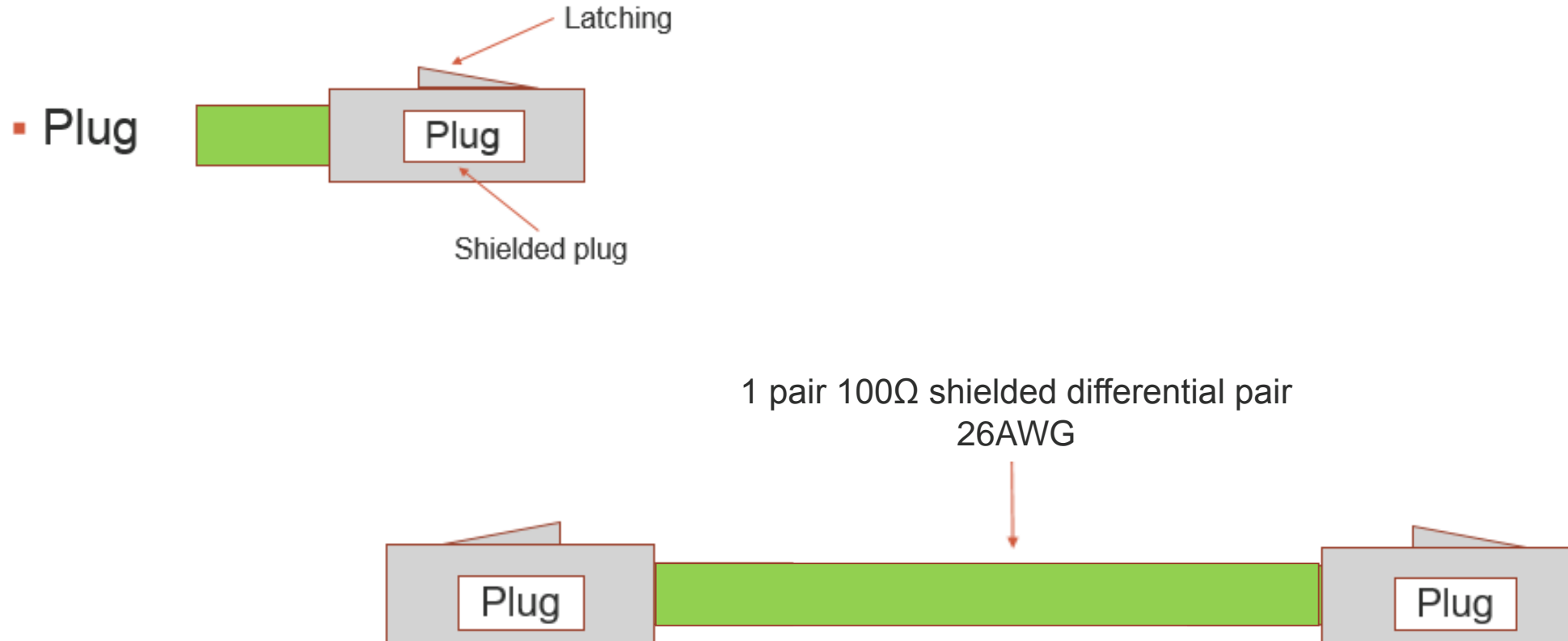
STP (7.5GHz) Link Segment Test Results

Harsh Patel (Molex, LLC), Mike Gardner (Molex, LLC)
Sasha Babenko (Molex, LLC)

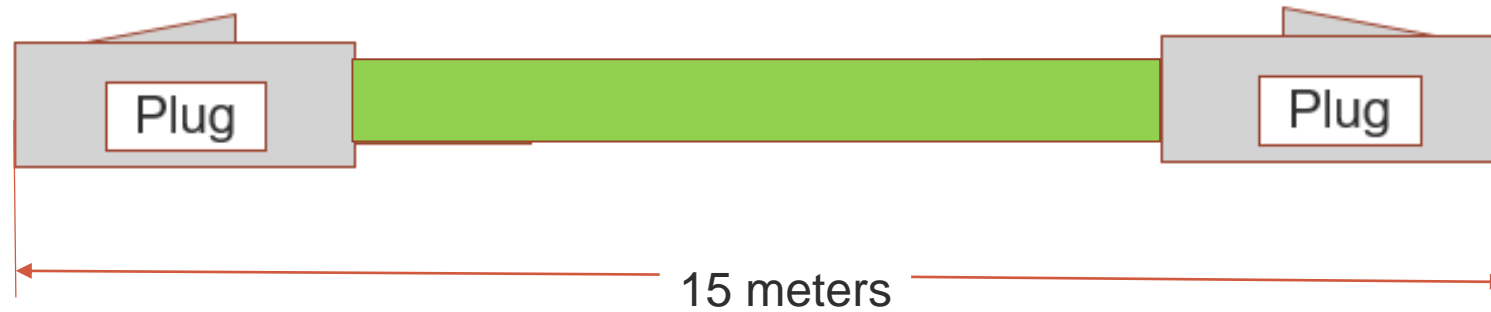
Scope

- Build and test one link segment.
- Total link length to be 15m (plug to plug with 4 inlines to be presented at a later date).
- Use of automotive grade connection system with shielded twisted pair cable.
 - It is a STP cable with unnamed cable/connector system in our development studies.
- Evaluate performance of Shielded differential link segment with a connection system for Next Generation Automotive Multi-gig Ethernet.
- Propose the signal integrity performance characteristics for a shielded differential link segment.
 - Data presented with a maximum frequency up to 7.5GHz.

Link Segment Elements / Definition (Illustrations)



Link Segment Configuration under test

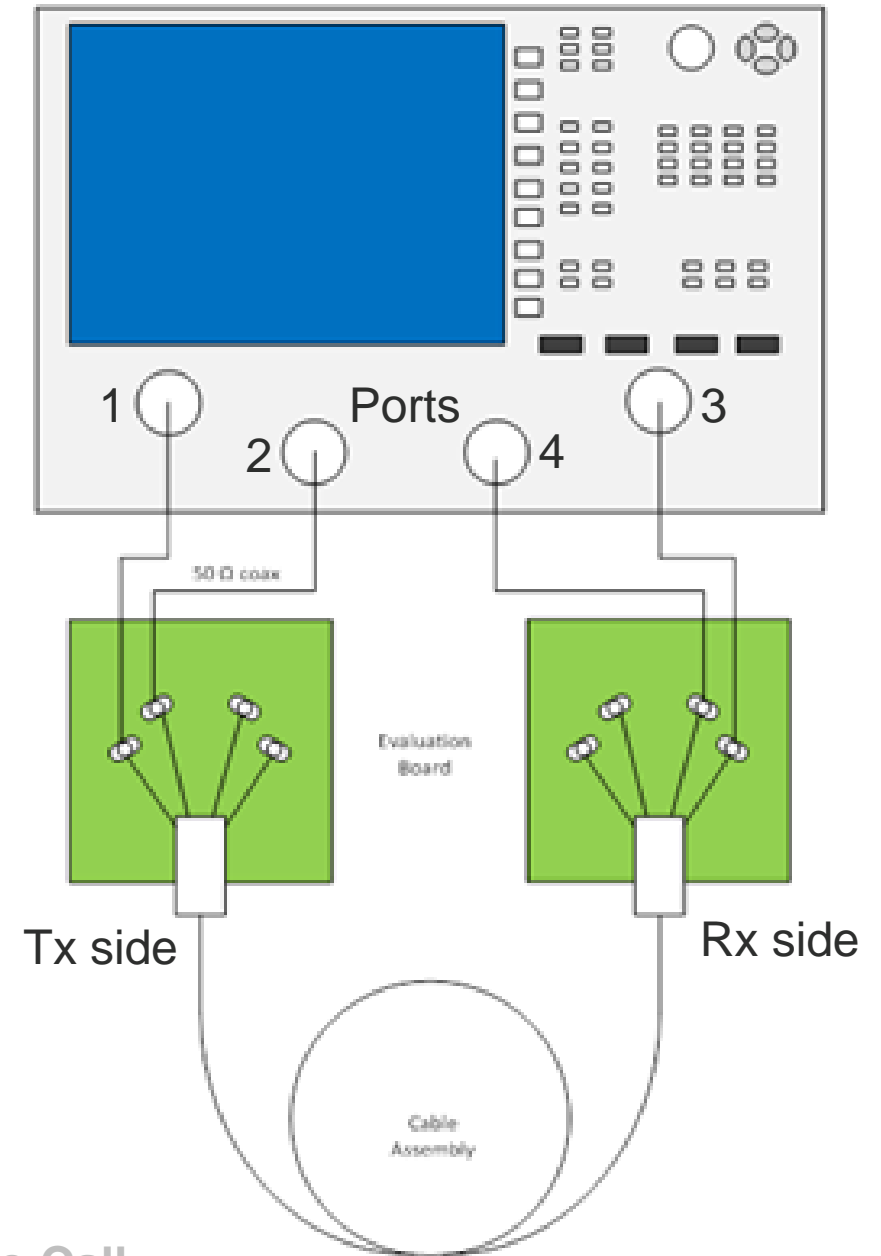


Reference Link Segment Proposed:

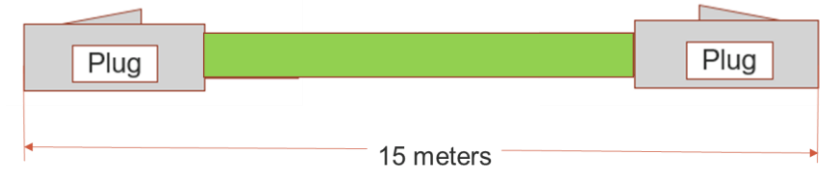
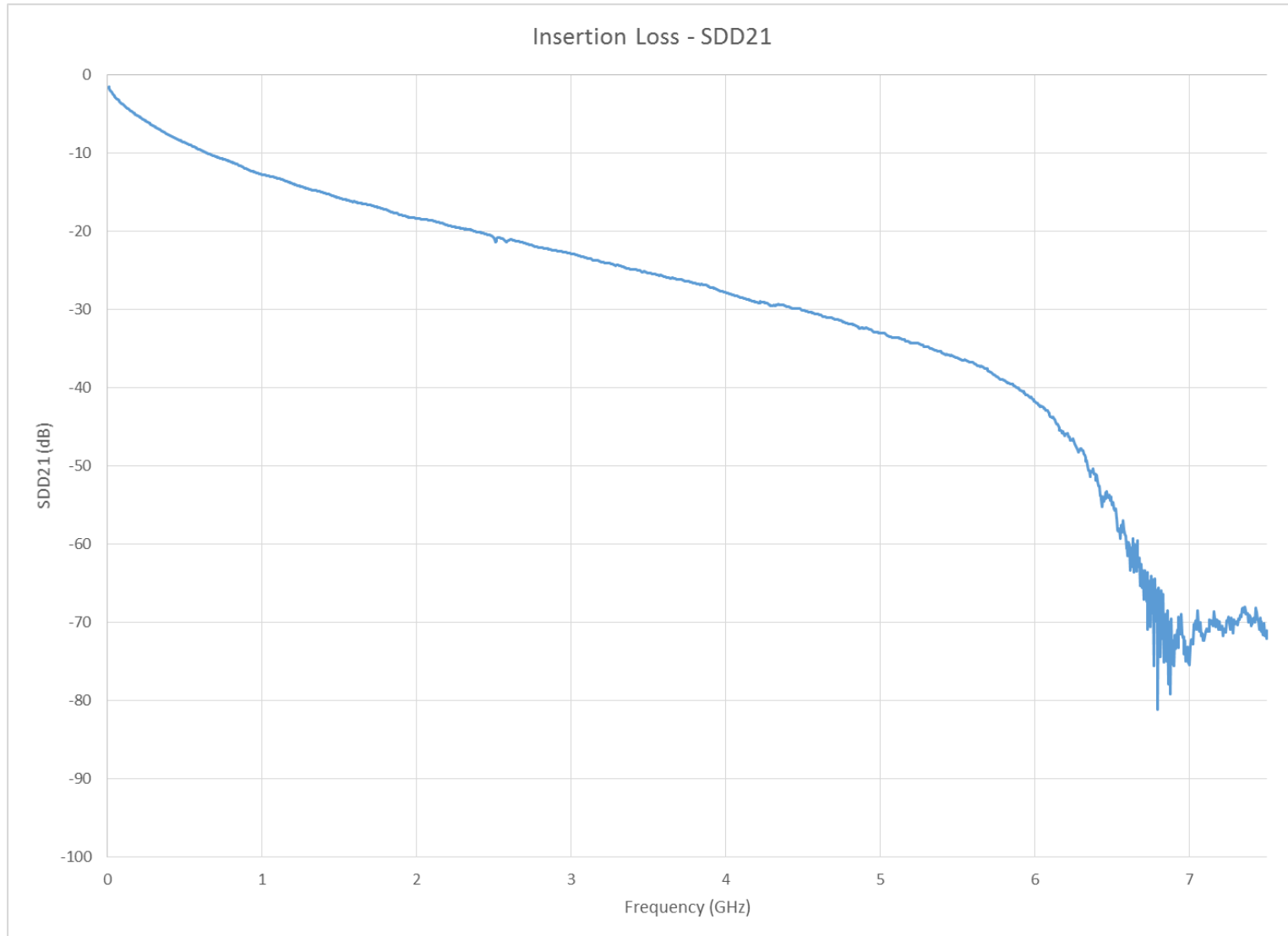
http://www.ieee802.org/3/ch/public/adhoc/Gardner_3NGAUTO_01a_061417.pdf

VNA test setup

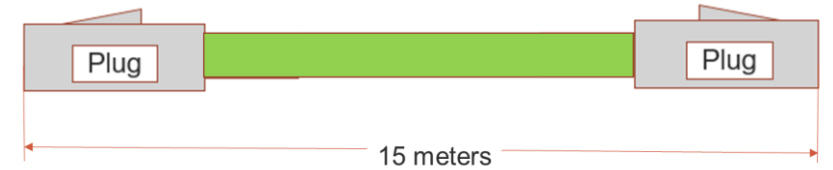
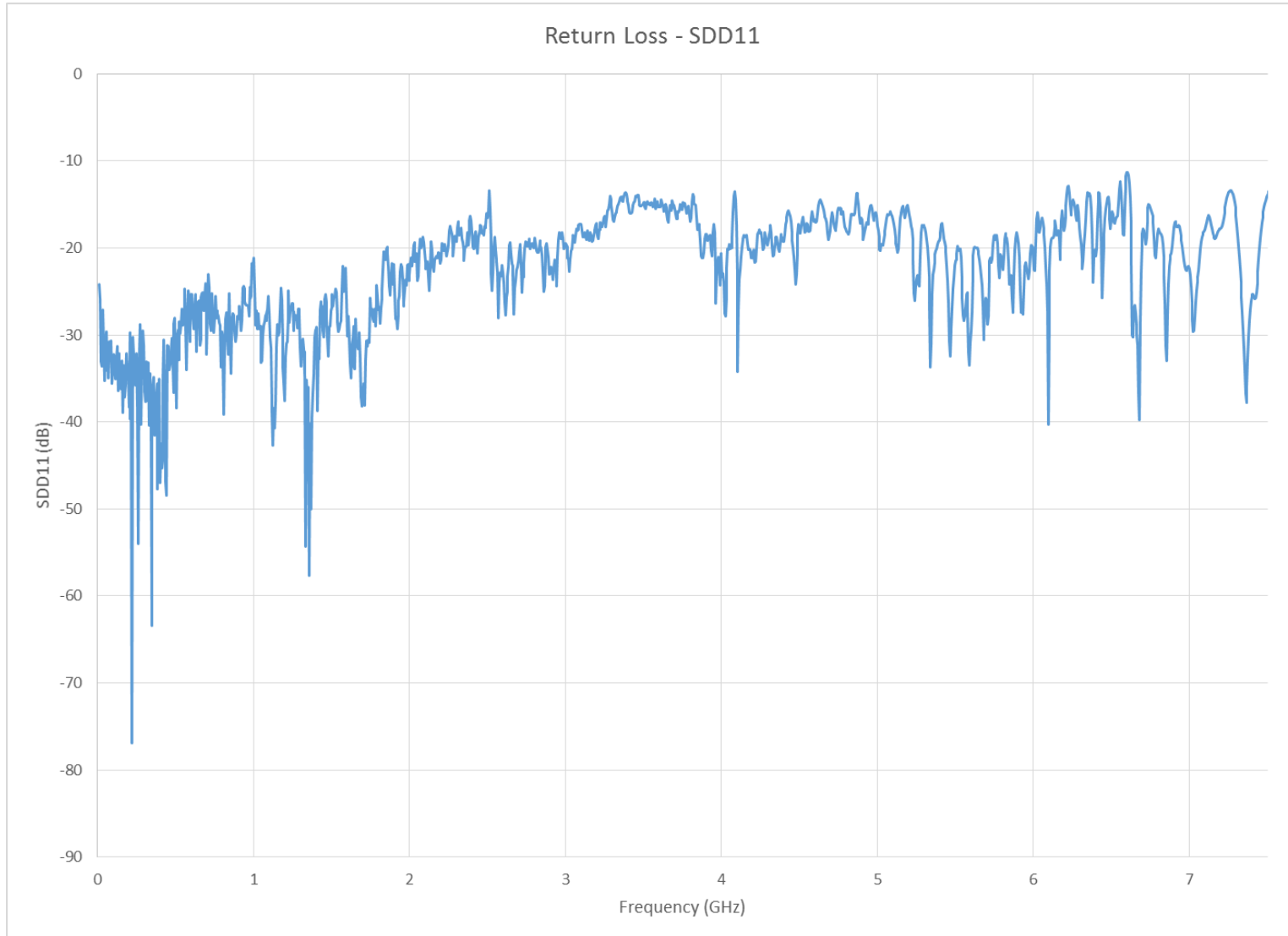
- Vector Network Analyzer model
 - Agilent N5230C 300 kHz - 20 GHz PNA-L
- Port Calibration
 - E-Cal calibration was used.
- Frequency range
 - Start Frequency: 10MHz
 - Stop Frequency: 7.5GHz
- Port selection
 - Tx Ports: 1&3
 - Rx Ports: 2&4



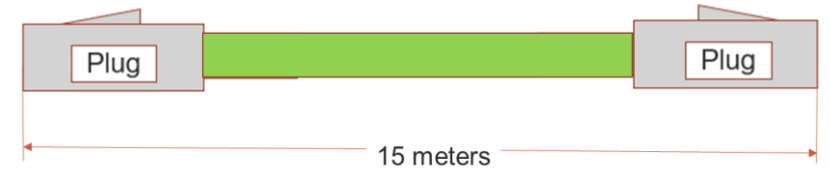
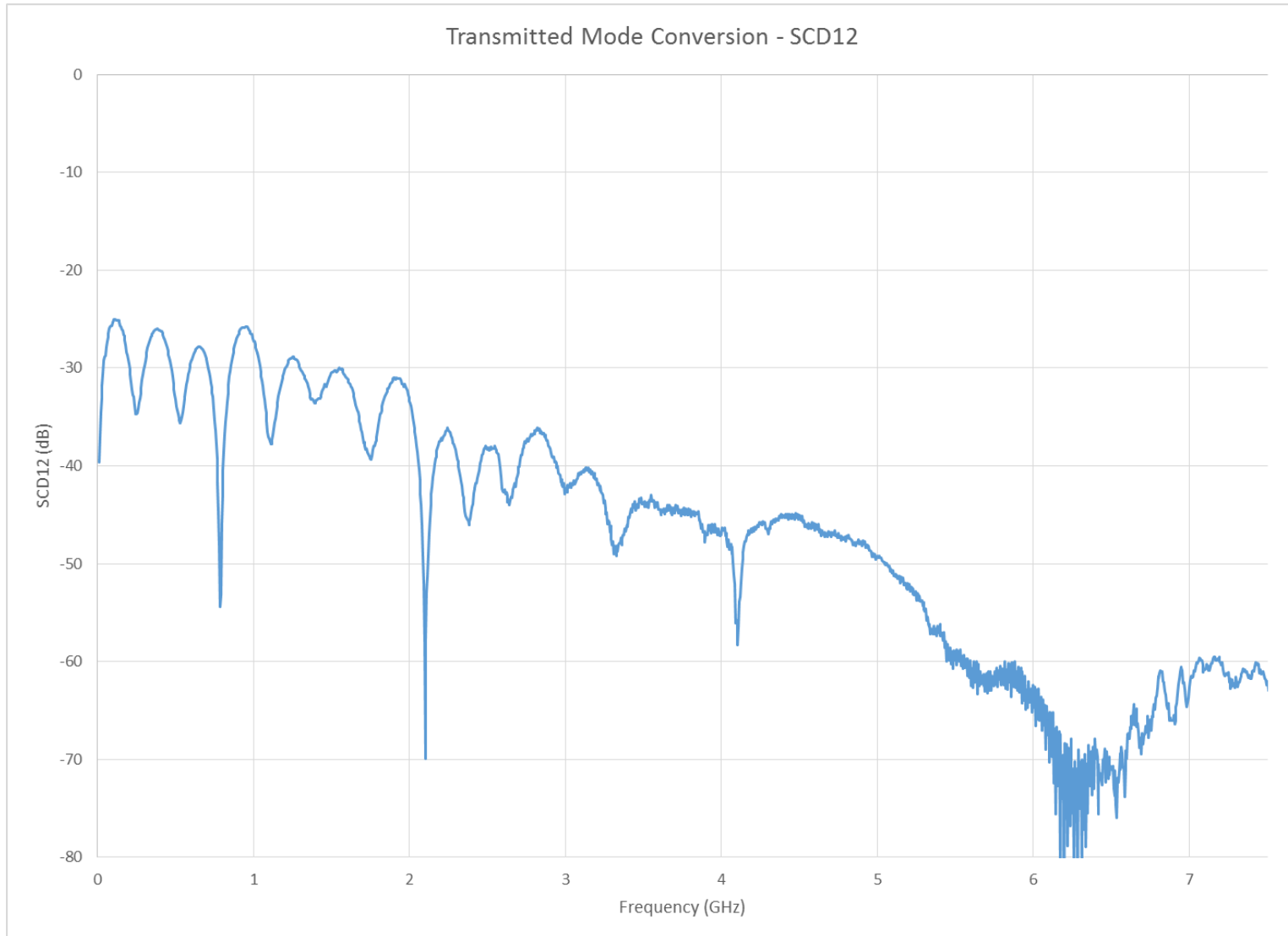
Insertion loss (26 AWG wire)



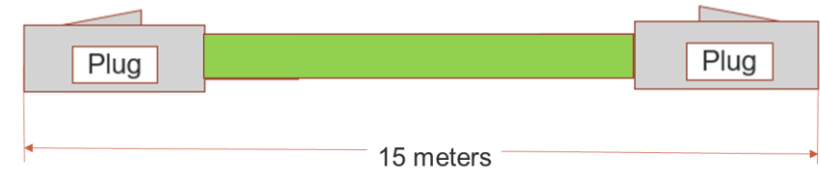
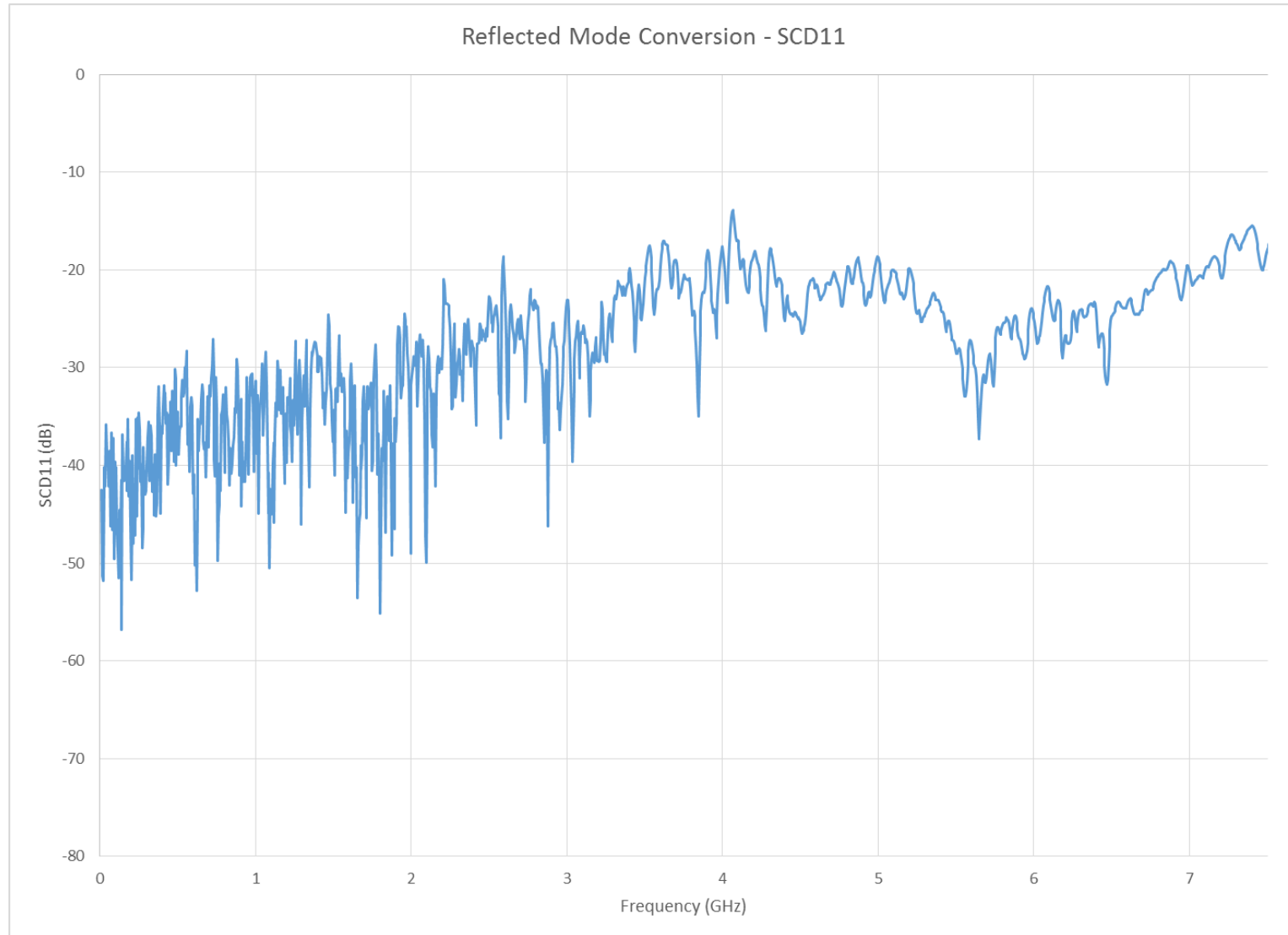
Return loss



Transmitted Mode Conversion



Reflected Mode Conversion



Summary

- Based on the presented STP results at 7.5GHz, baseline limits can be made.
 - Other cable construction types should be evaluated and will likely provide better margins.
- As committee further defines baseline channel limits, further test data will be shared.

Thank You!
Questions?