

# 500m 18AWG SPE Channel

Bob Voss

Panduit Corp.

18Jan2023

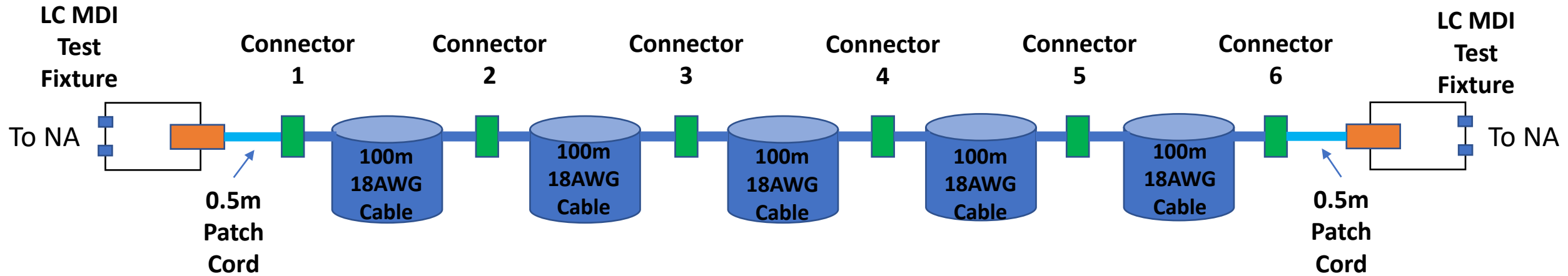
# Premise/Objective

- Determine if 802.3dg link performance objectives can be met using one half of the link segment defined in 802.3cg
  - 500m of 18AWG cable
  - 6 intermediate connectors
  - LC MDI Test Fixtures
  - 100 Mb/s
- Examine the practice of permitting terminals as intermediate connectors at the higher frequencies required for 100 Mb/s
- Examine workmanship impacts, e.g. excessive conductor un-twist

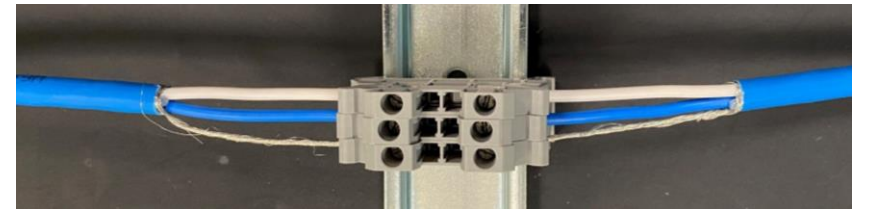
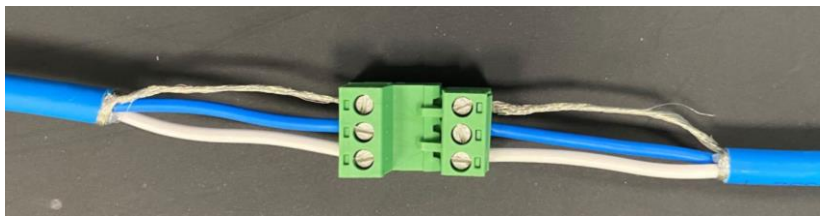
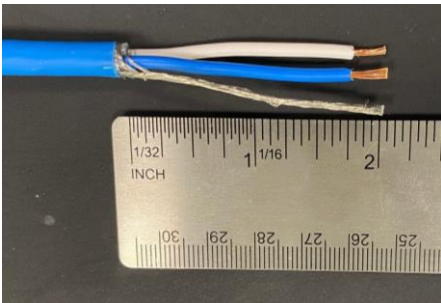
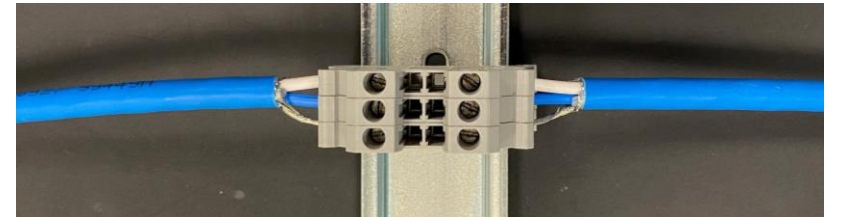
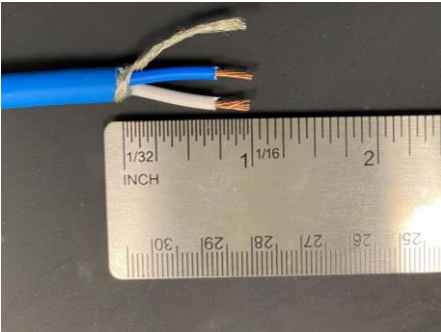
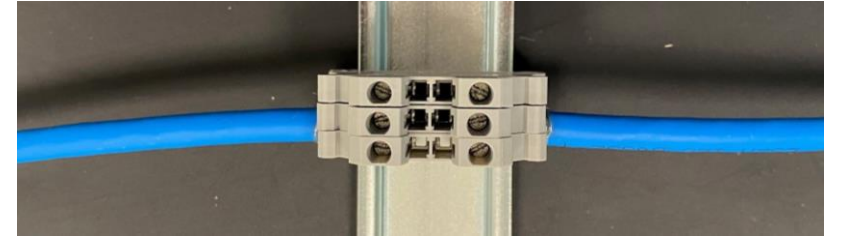
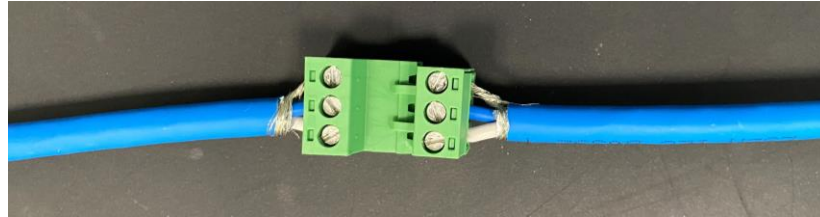
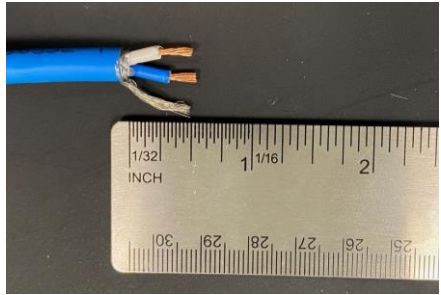
# Acknowledgements

- Paul Wachtel, Panduit Corp.
- Rick Rago, Panduit Corp.
- Graber contribution, "AWG16 and AWG14 Cable Measurements"  
[https://www.ieee802.org/3/dg/public/May\\_2022/graber\\_3dg\\_01\\_12\\_142022.pdf](https://www.ieee802.org/3/dg/public/May_2022/graber_3dg_01_12_142022.pdf)
- Larsen contribution, "Link Segment Ideas"  
[https://www.ieee802.org/3/dg/public/May\\_2022/larsen\\_3dg\\_01\\_12\\_142022.pdf](https://www.ieee802.org/3/dg/public/May_2022/larsen_3dg_01_12_142022.pdf)

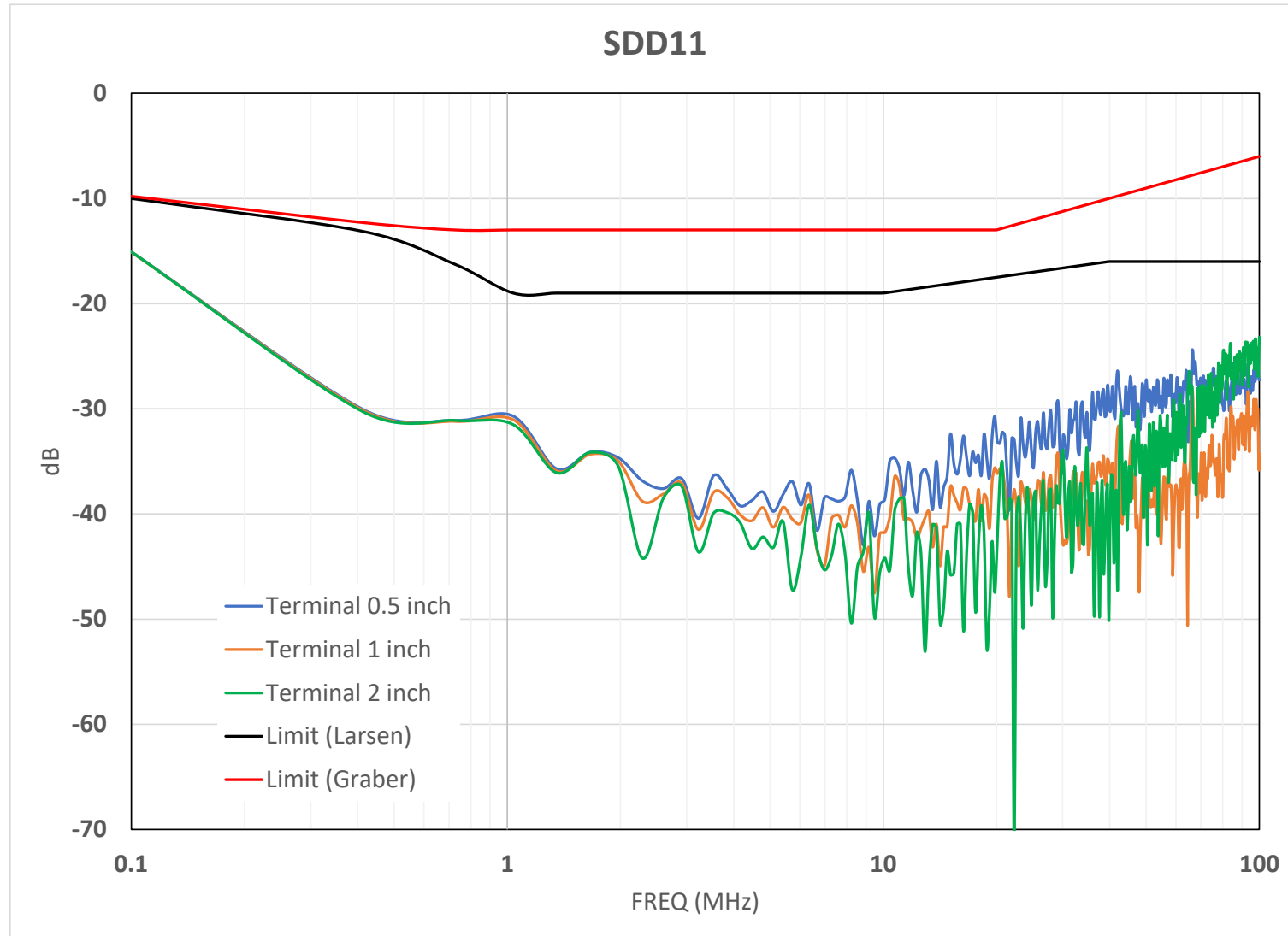
# 500 Meter Channel Under Test



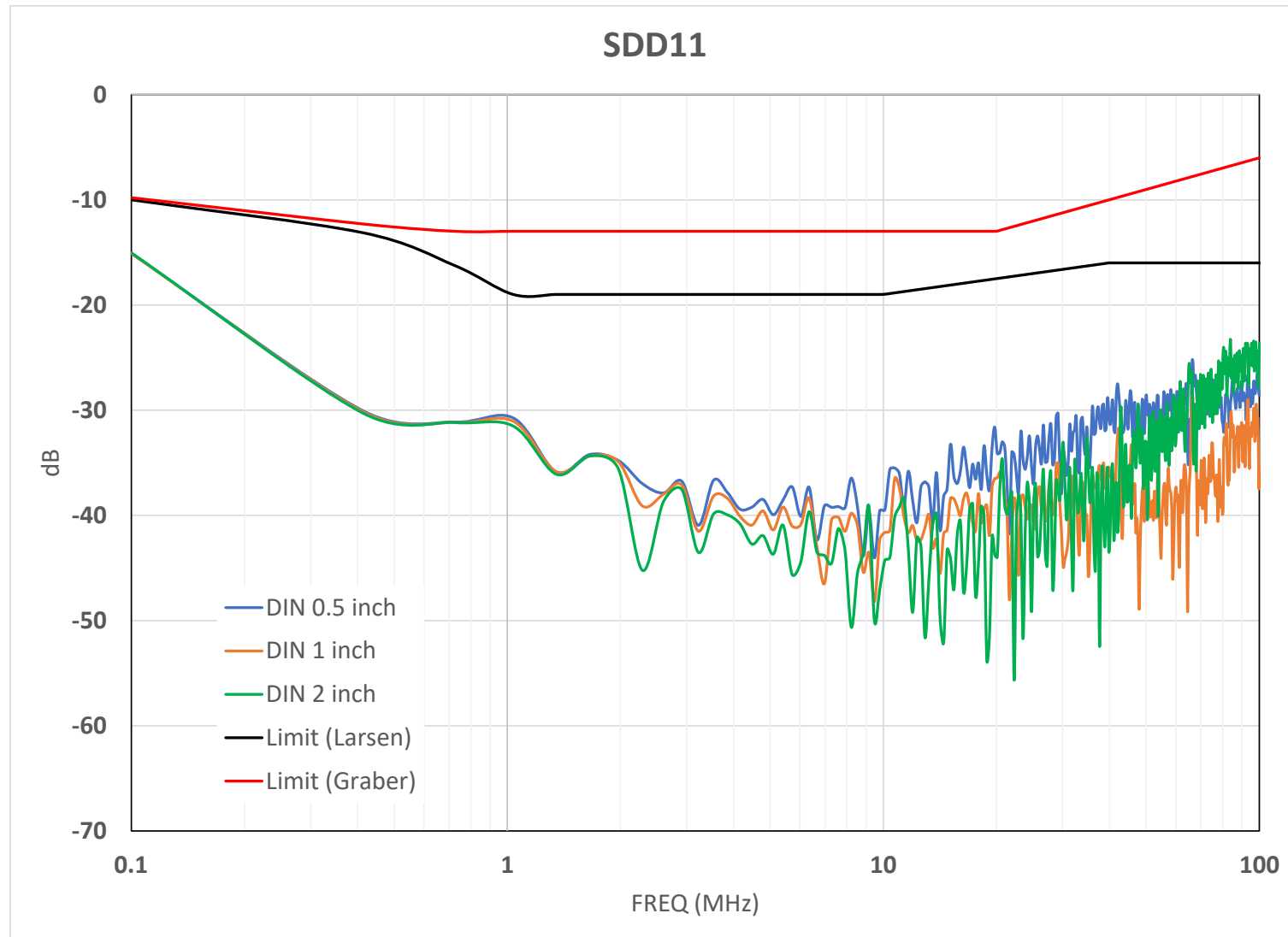
# Connector Types and Terminations



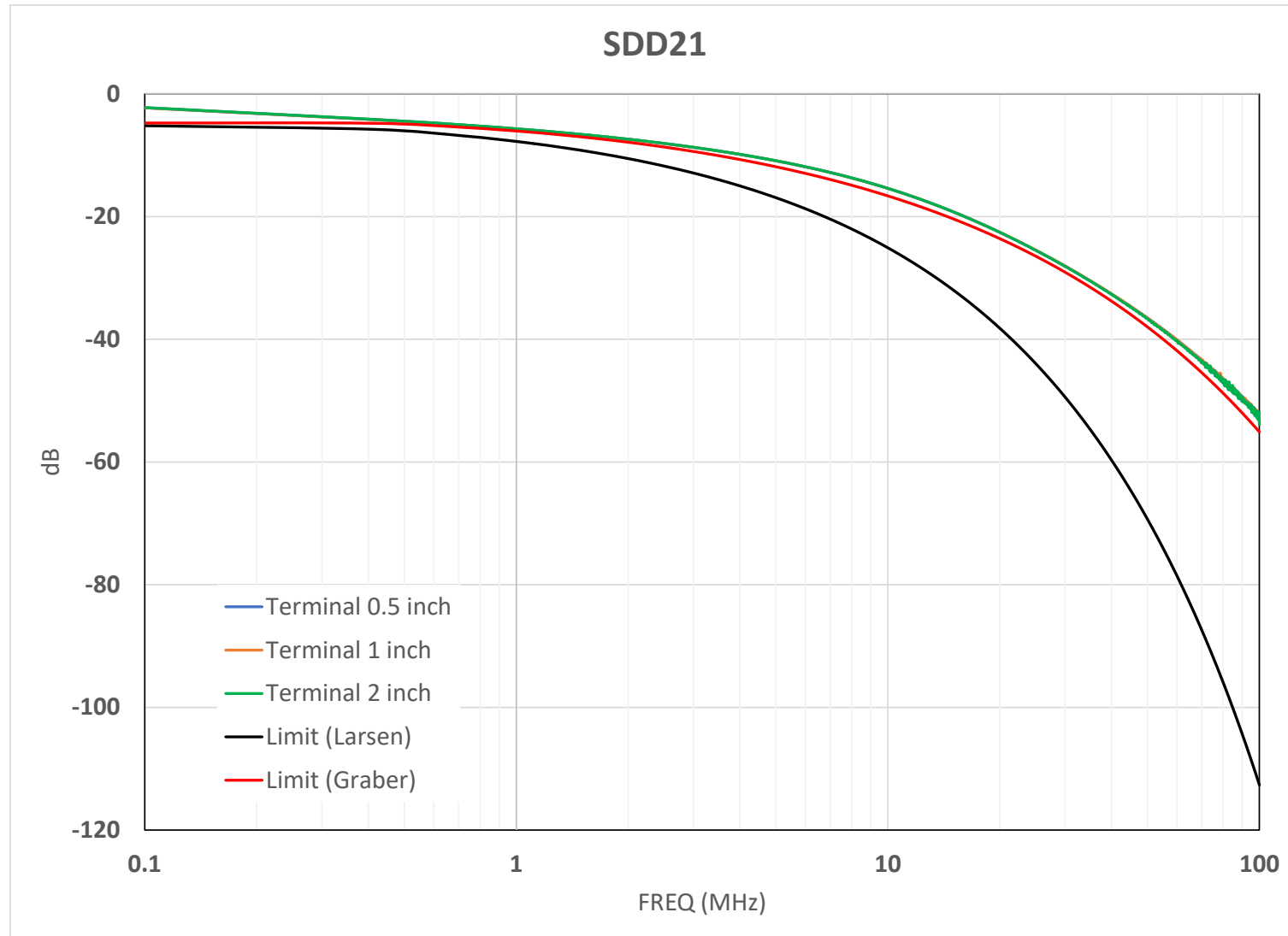
# Return Loss (Terminal Block Connector)



# Return Loss (DIN Rail Connector)



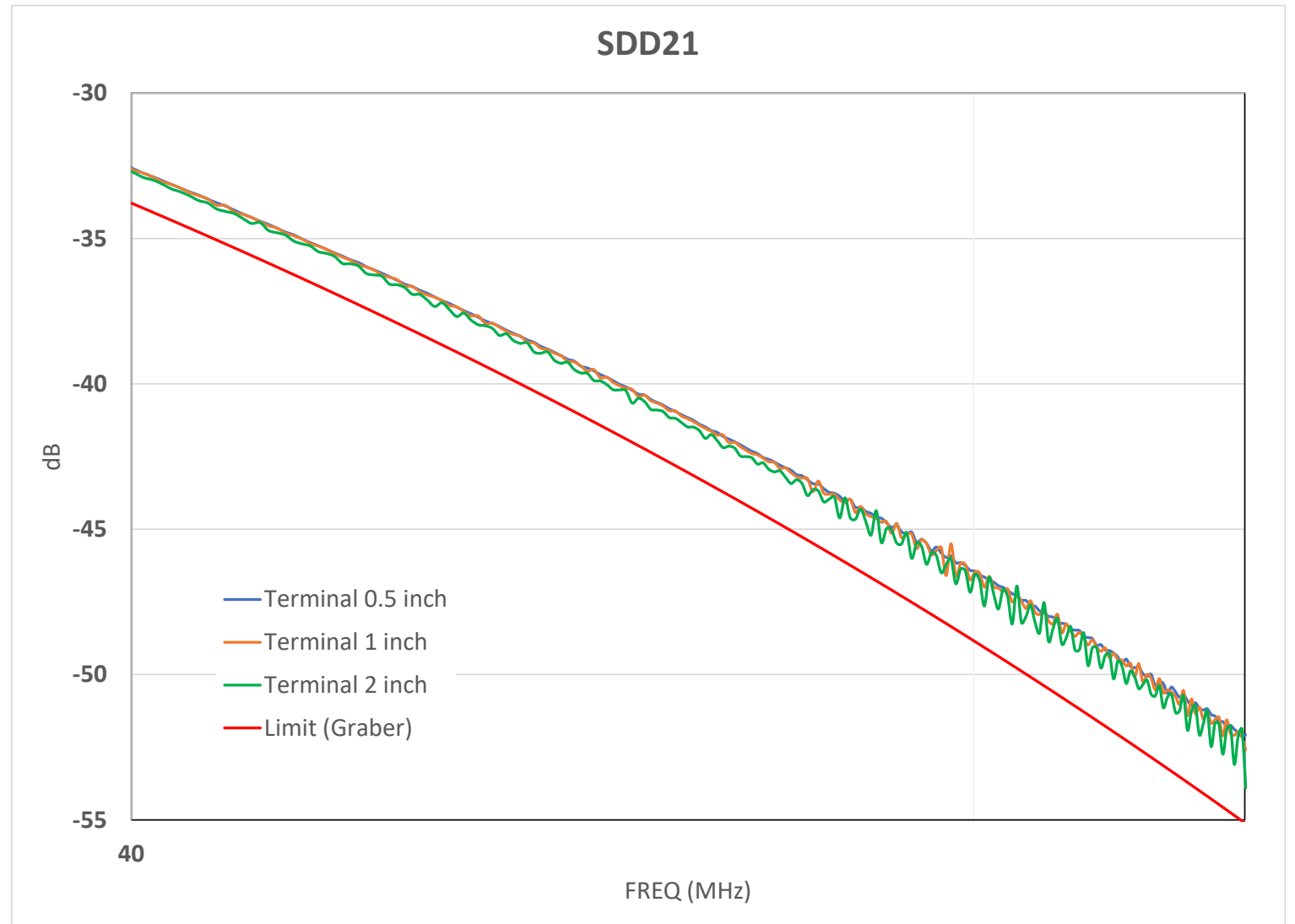
# Insertion Loss (Terminal Block Connector)



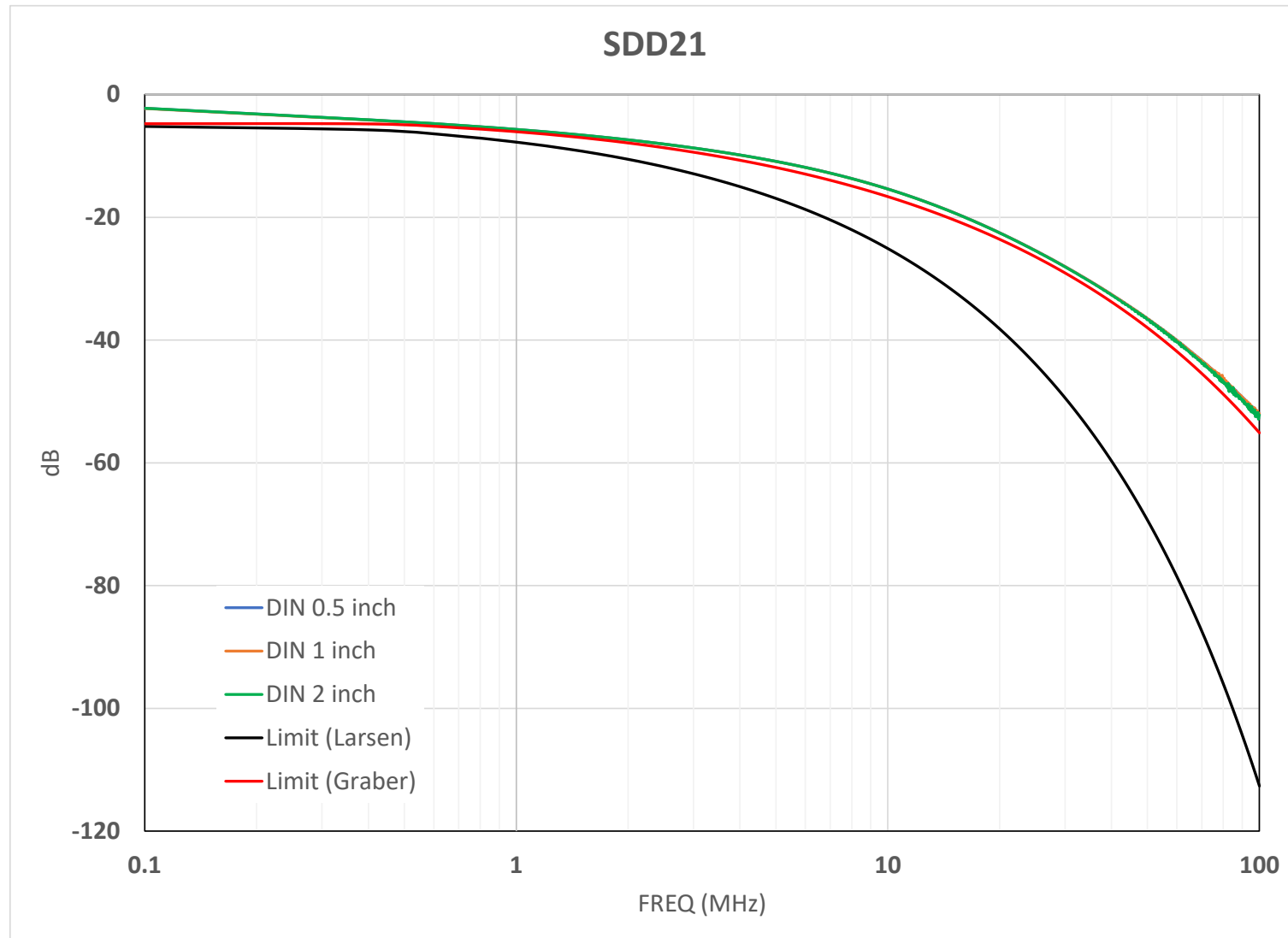


# Insertion Loss (Terminal Block Connector)

- Impact of termination evident beyond 40MHz

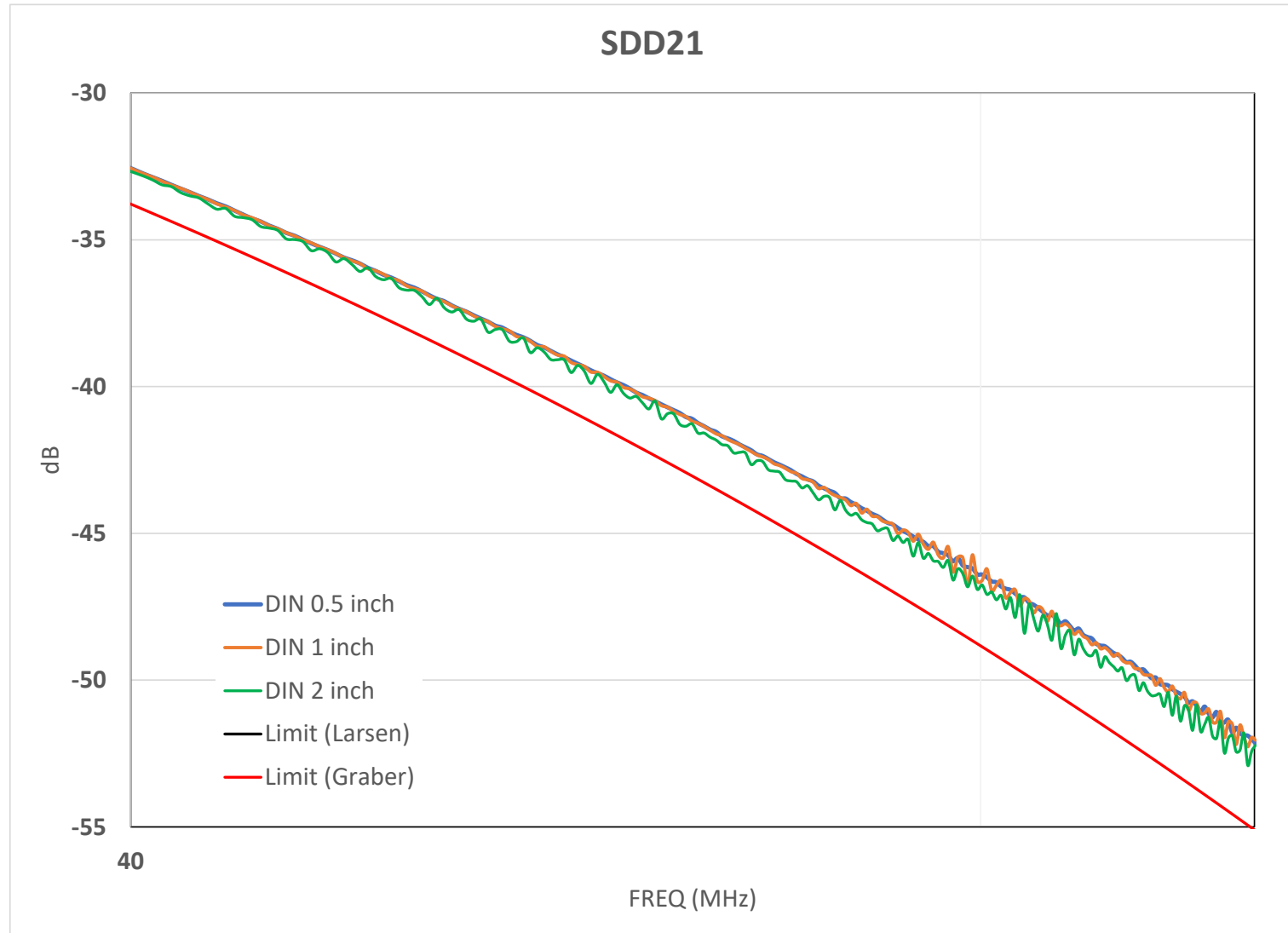


# Insertion Loss (DIN Rail Connector)



# Insertion Loss (DIN Rail Connector)

- Impact of termination evident beyond 40MHz



# Conclusions and Observations

- An 18AWG 500m/6 connector/100 Mb/s link is feasible and meets 802.3df performance objectives with adequate margin
- Both connector styles show similar compliant performance
- Impact of termination workmanship is evident > 40MHz