



# IEEE 802.3dg Alien Crosstalk

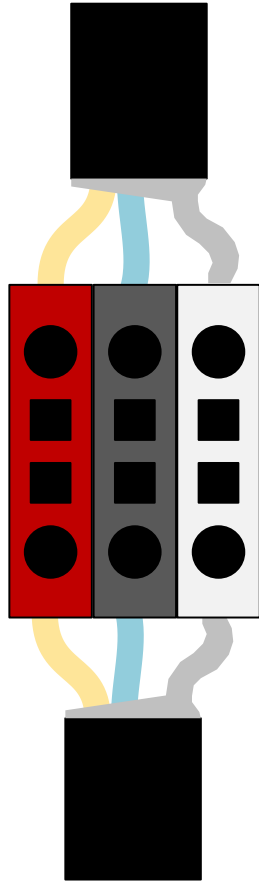
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## **SPE LINK SEGMENT ANALYSIS**

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July 11, 2023

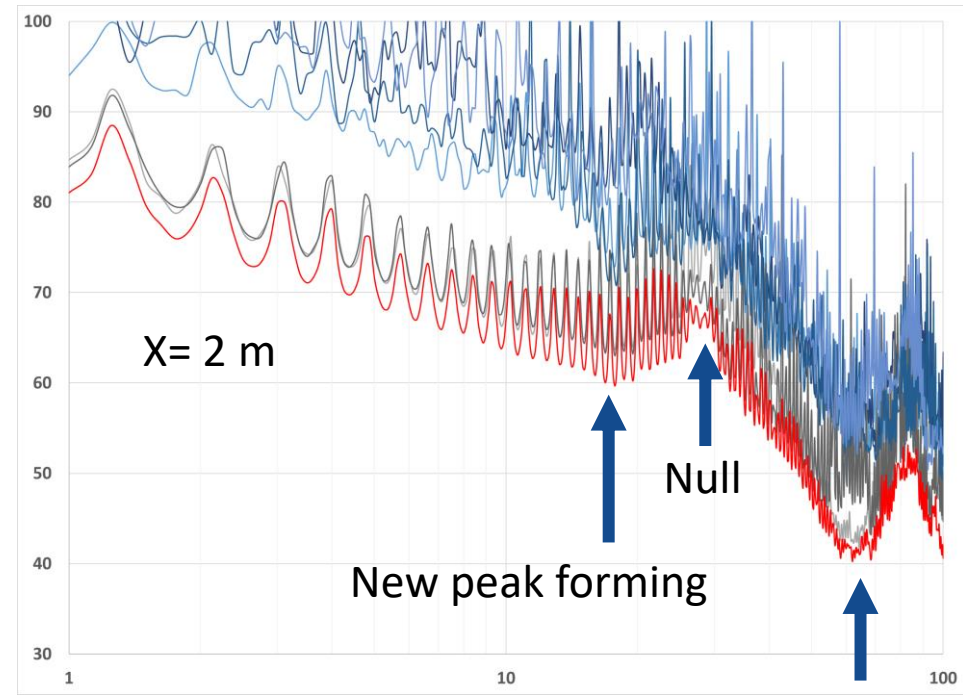
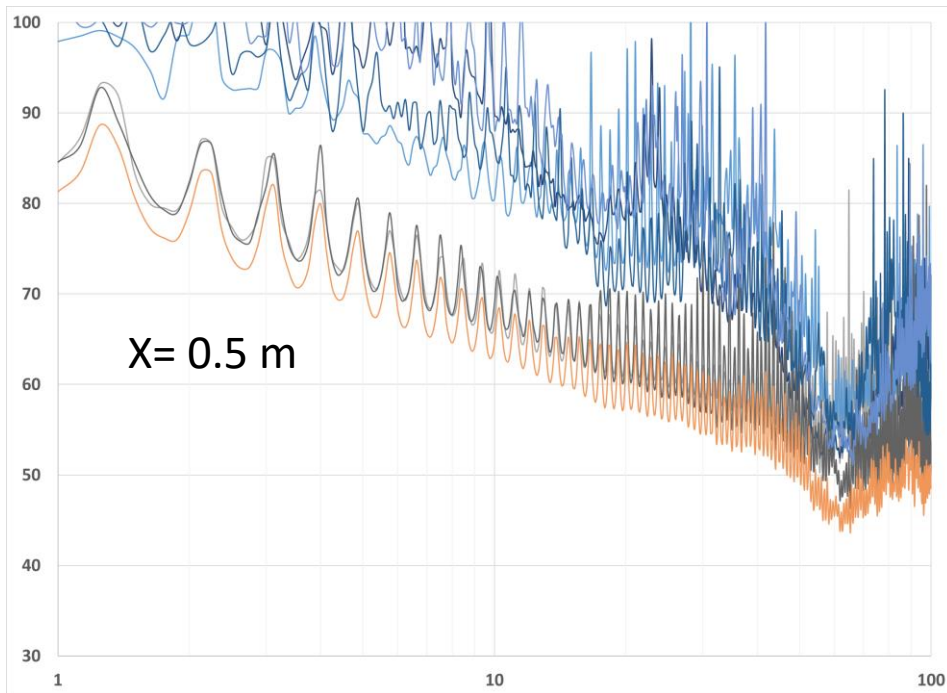
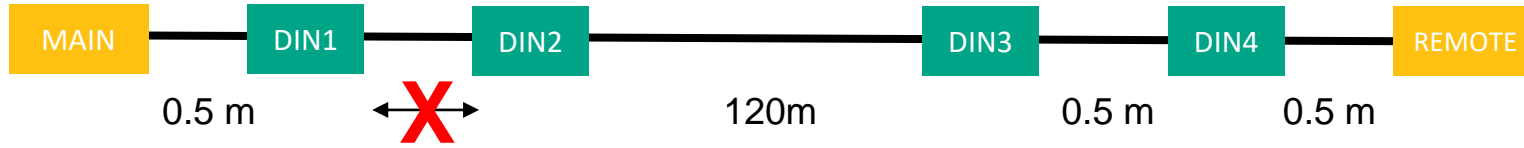
# Overview



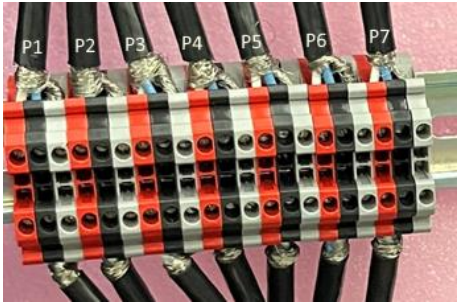
Depiction of three conductor connector known to cause variability in ANEXT

- Use of connector to terminate three conductors of a cable introduces variability in Alien Crosstalk performance.
  - Variability in link segment configuration.
  - Variability in termination method.
- Mitigation technic for consideration has potential to:
  - Eliminate ANEXT spike anomalies.
    - Independent of link segment configuration.
    - Reduced dependance of termination workmanship.
  - Promotes use of Alien Crosstalk limits that are not link length dependent.

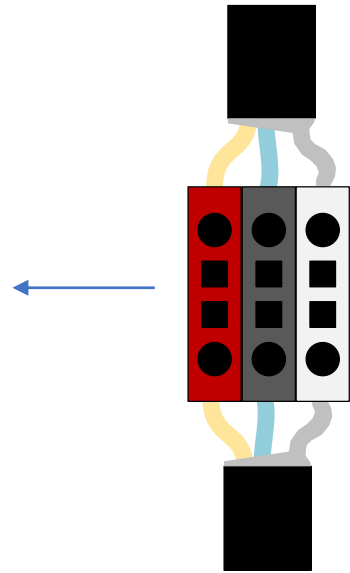
# 6 around 1 ANEXT – change of one cord length



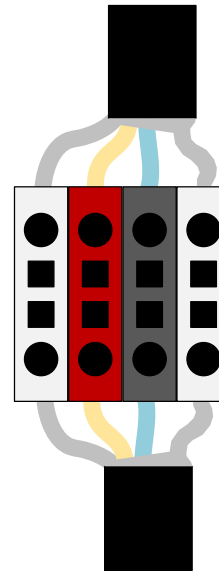
# Mitigation technic for consideration



Un-mitigated  
connector array



Three conductor connector  
known to cause variability  
in ANEXT

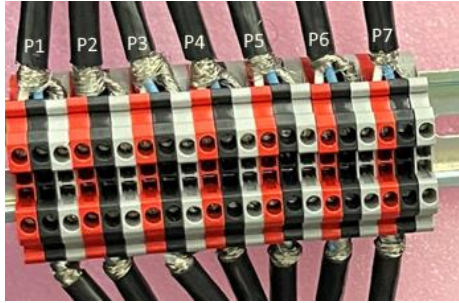


Four conductor connector  
under consideration

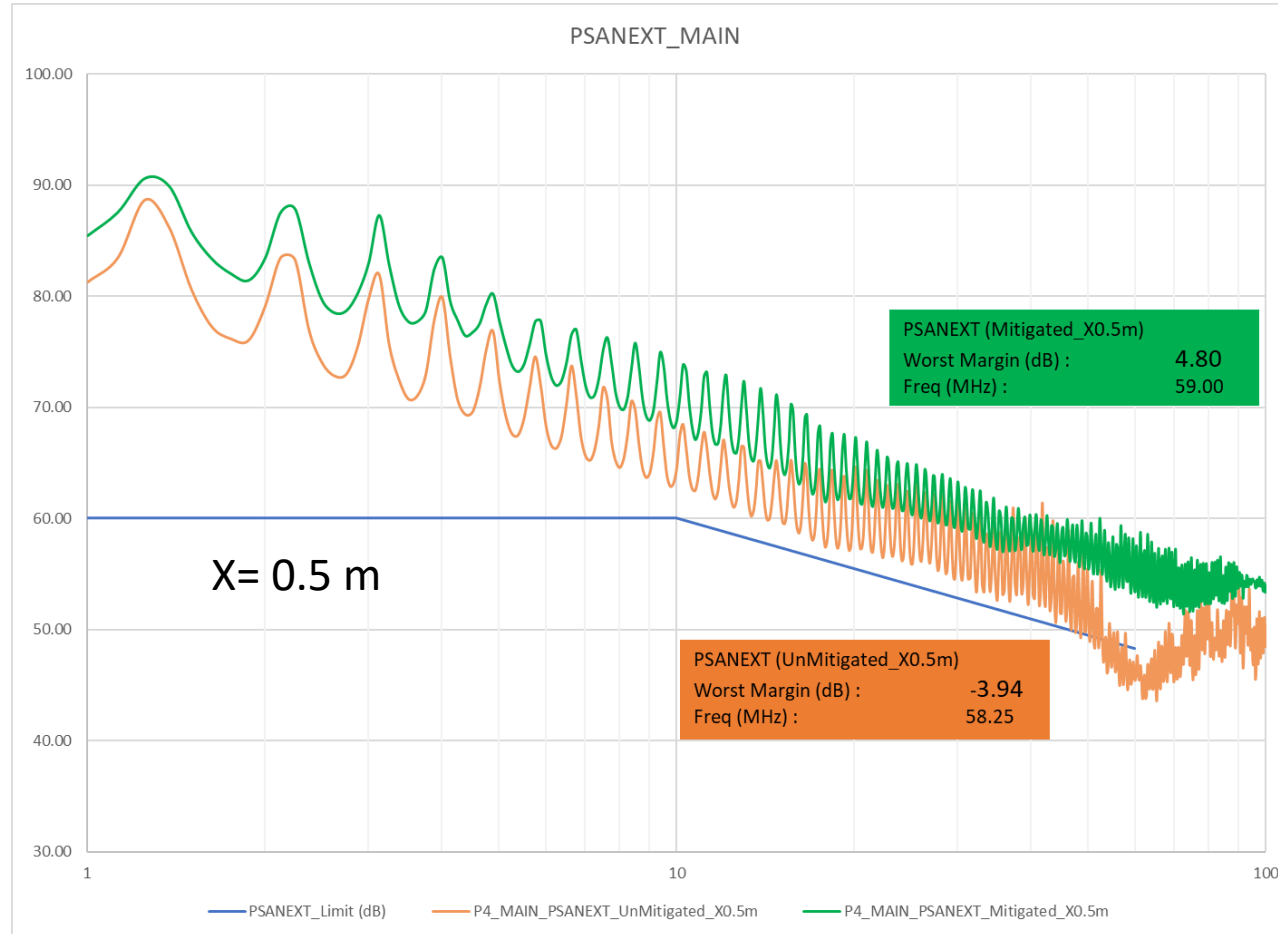
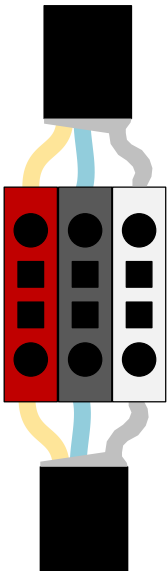


Mitigated  
connector array  
(Note: only one extra connector)

# Alien Mitigation – PSANEXT



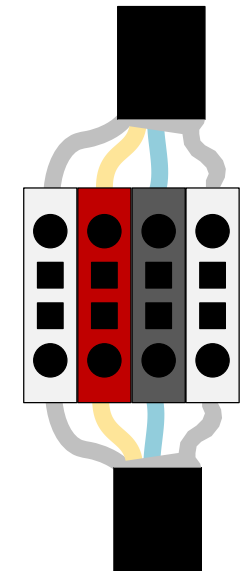
Un-mitigated -----



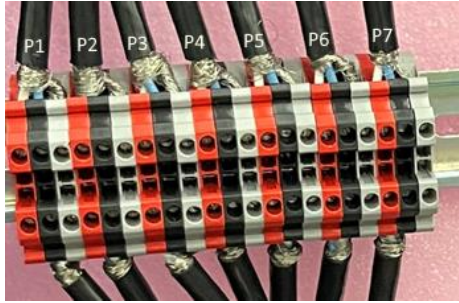
- Removes spikes
- PSANEXT below a length independent specification



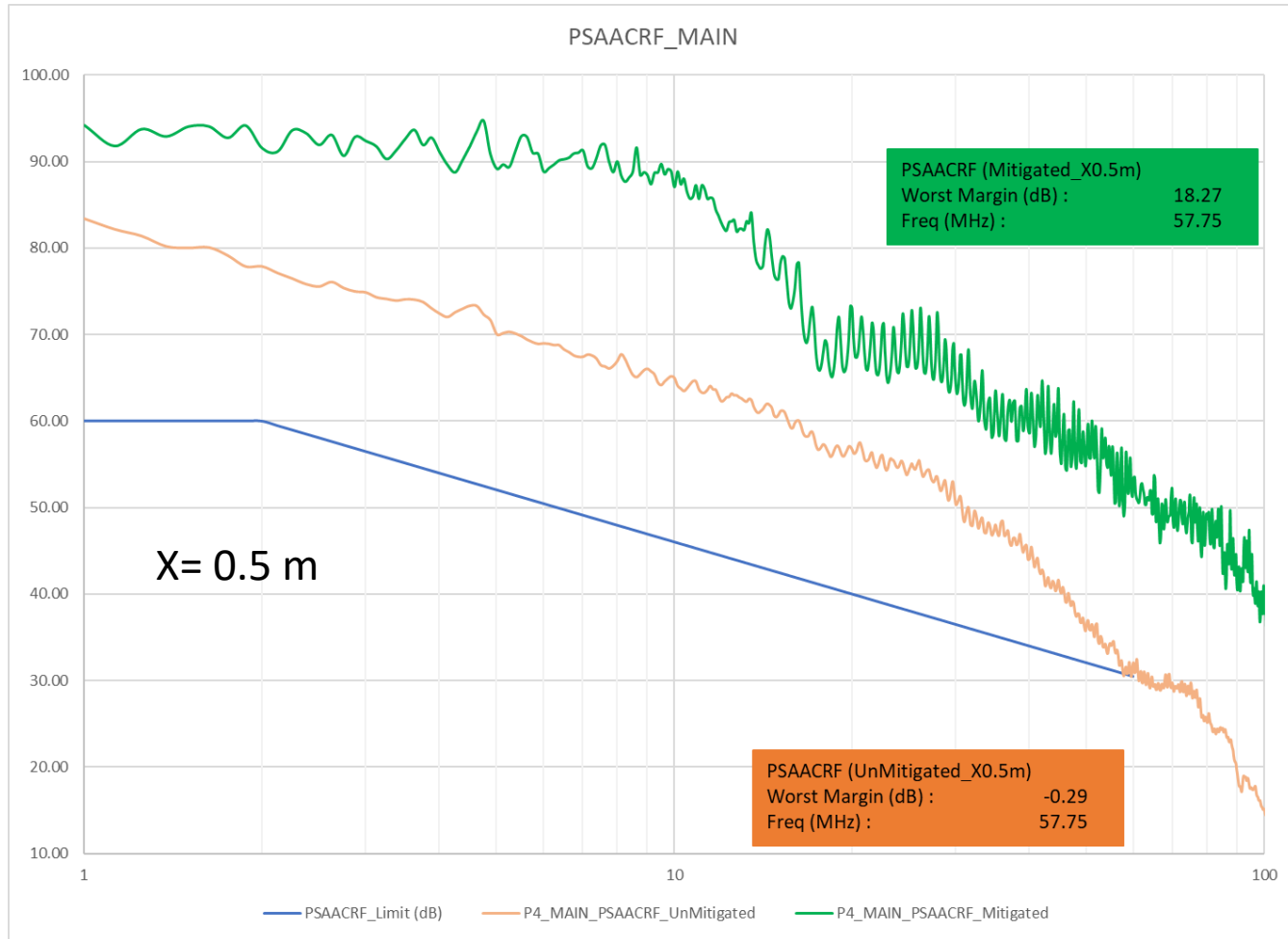
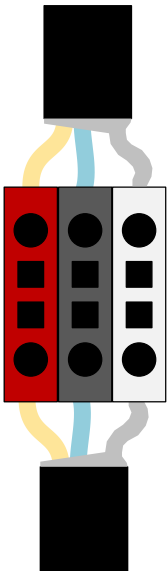
Mitigated -----



# Alien Mitigation – PSAACRF (aka PSAFEXT)



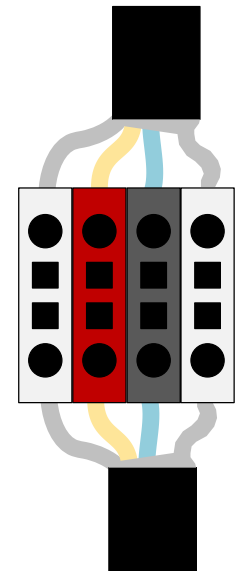
Un-mitigated -----



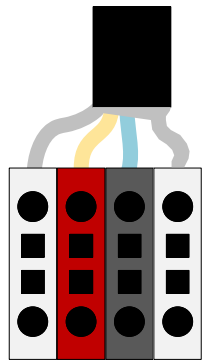
- Improve PSAACRF greater than 18 dB



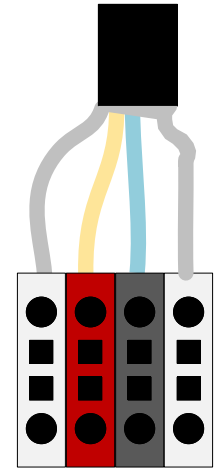
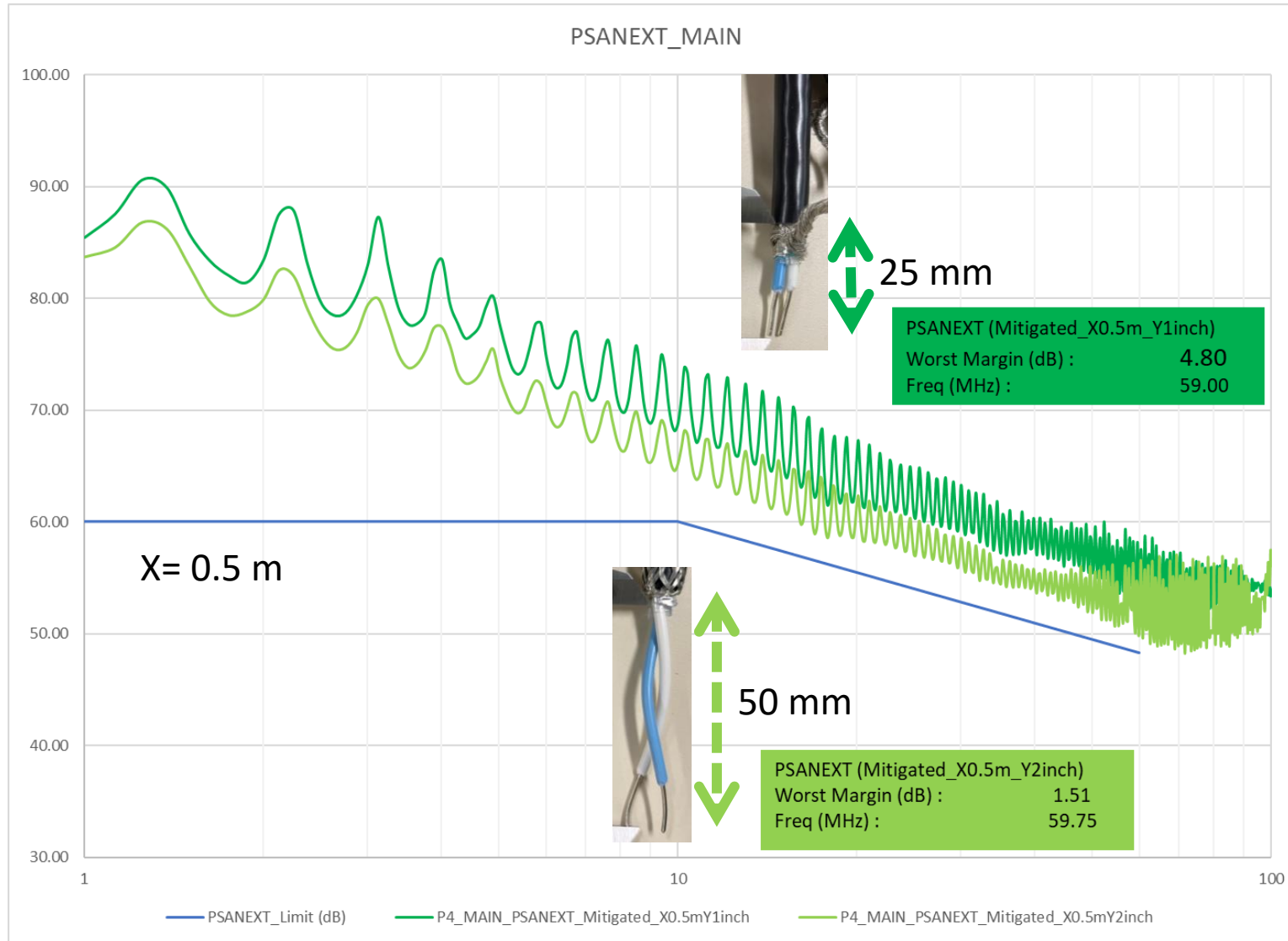
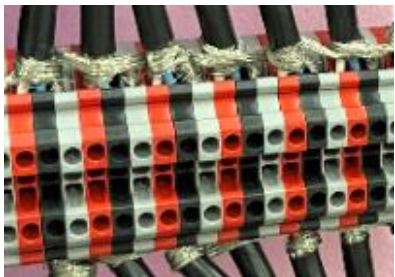
Mitigated -----



# PSANEXT Mitigation – Longer Untwist



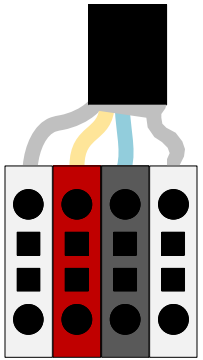
25mm -----



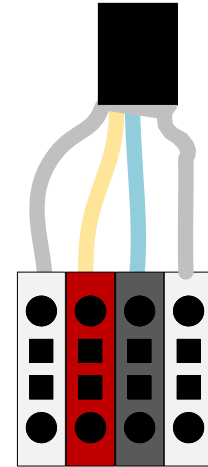
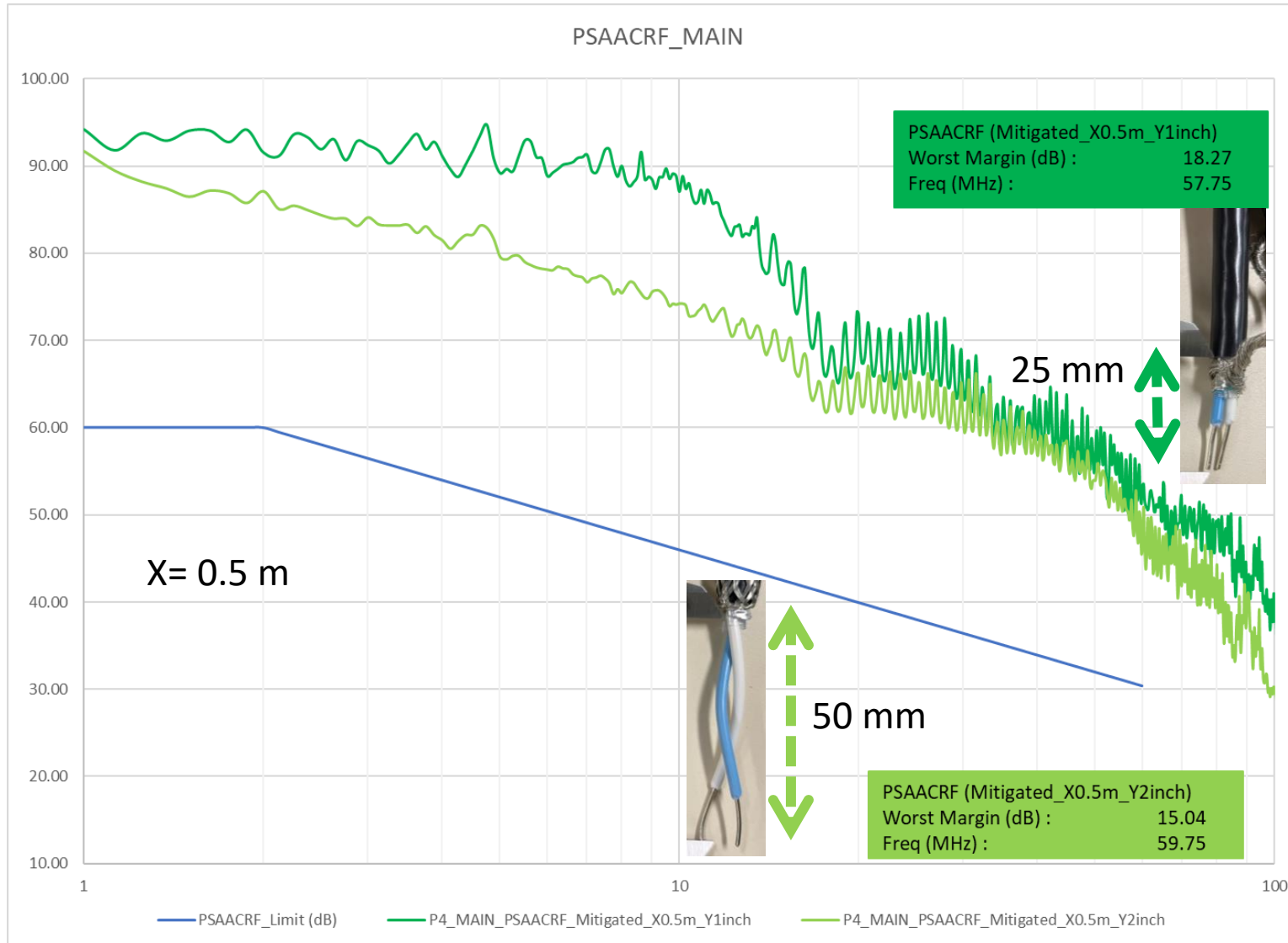
50mm -----



# PSAACRF Mitigation – Longer Untwist



25mm

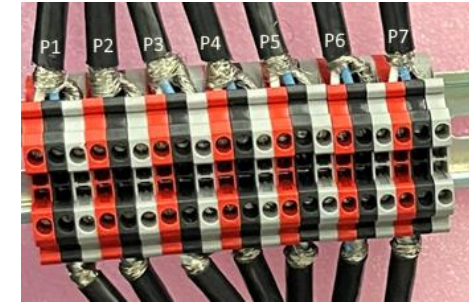
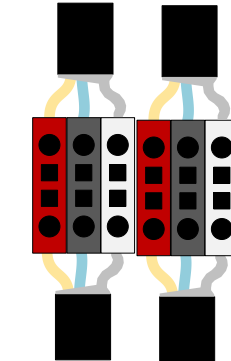
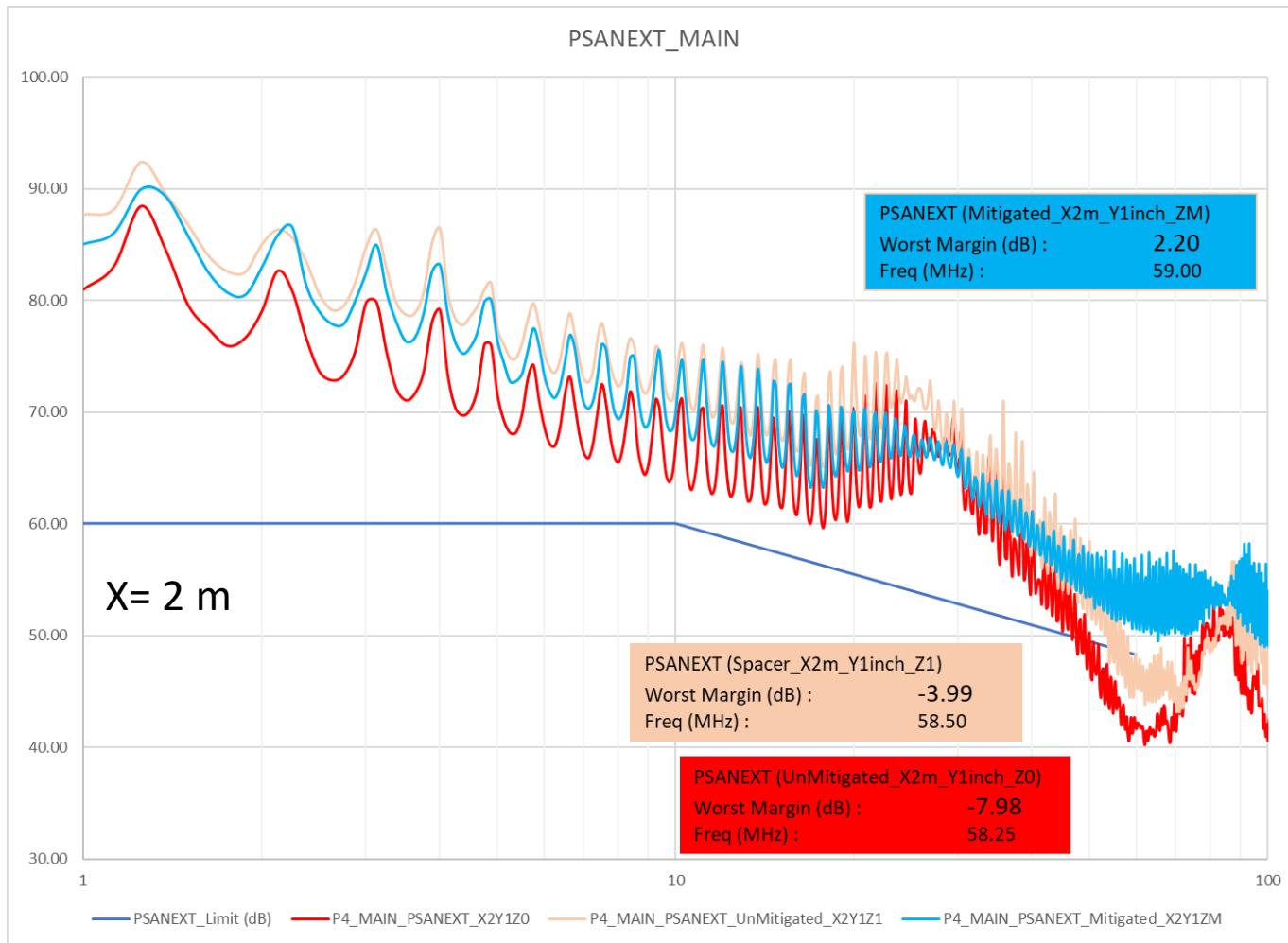


50mm

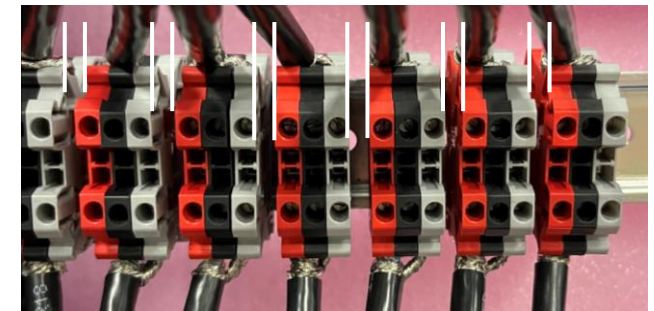
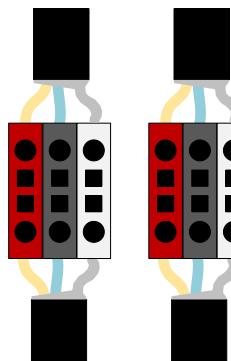




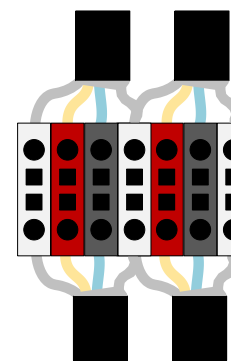
# PSANEXT Mitigation – Connector Separation



Case 1 Un-mitigated -----

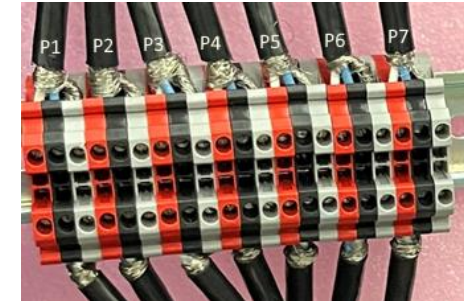
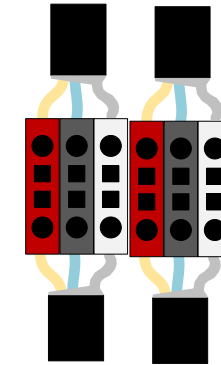
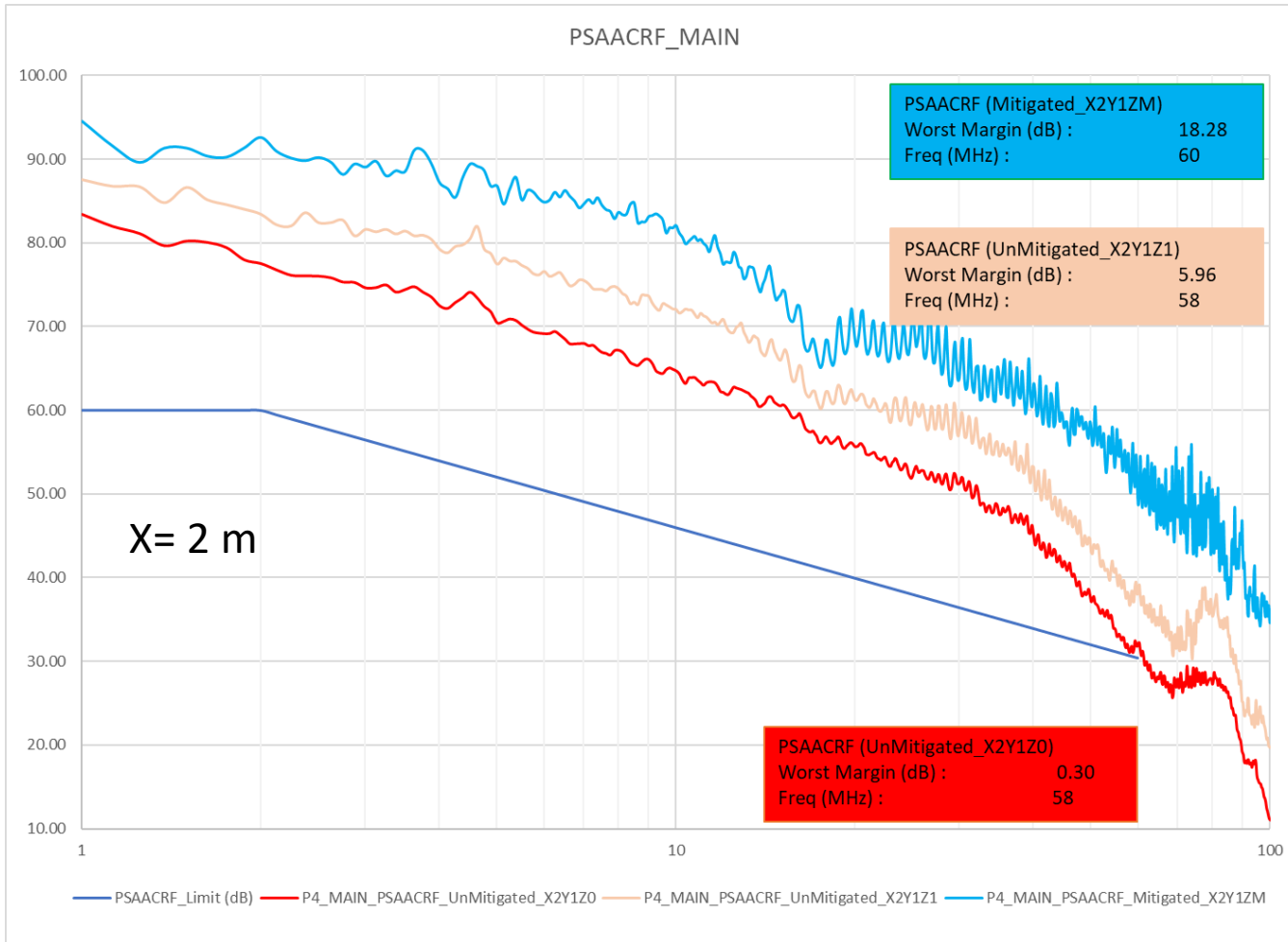


Case 2 (1connector Separation) -----

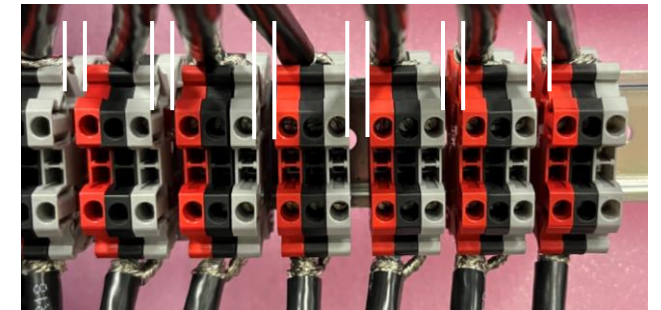
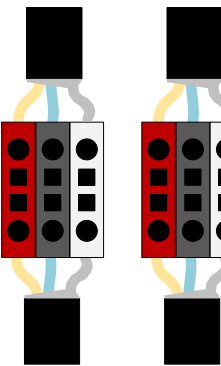


Case 3 Mitigation -----

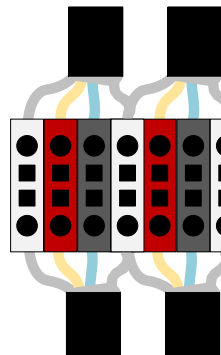
# PSAACRF Mitigation – Connector Separation



Case 1 Un-mitigated -----

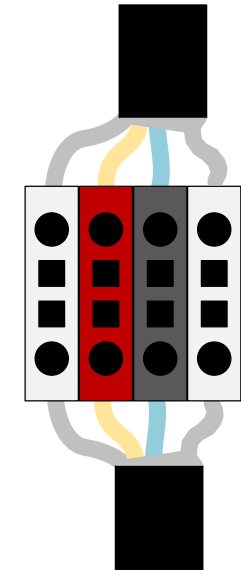
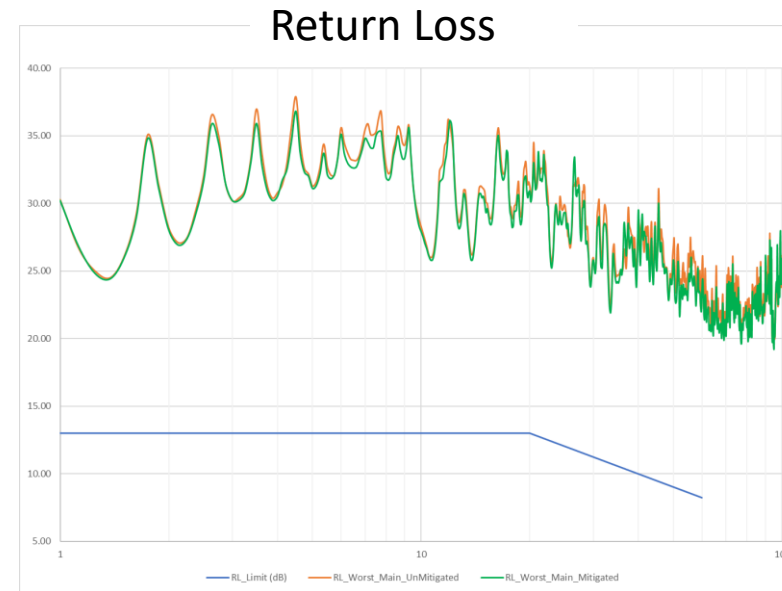
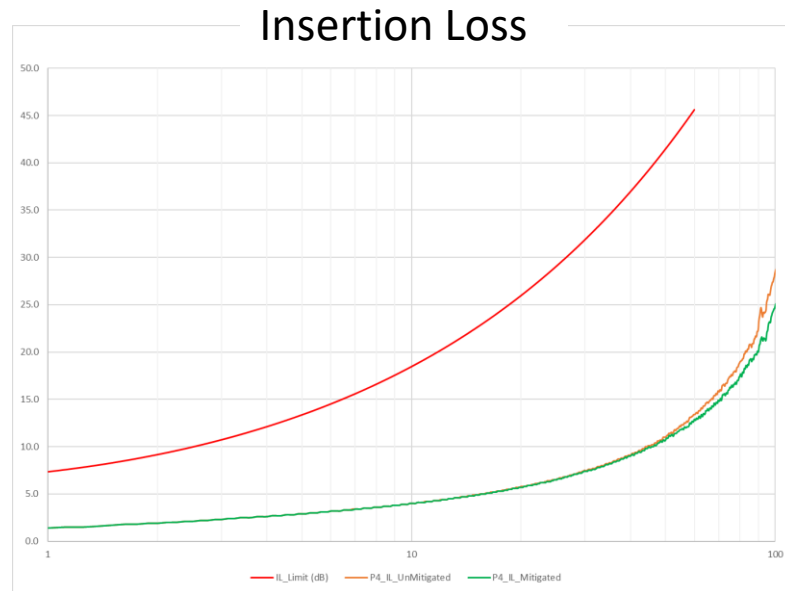
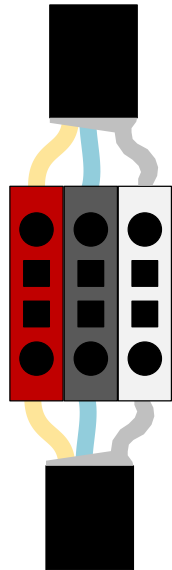


Case 2 (1connector Separation) -----



Case 3 Mitigation -----

# Return Loss and Insertion Loss



Un-mitigated -----

Mitigated -----

- IL and RL of victim link segment shown ( $X=0.5m$ ).
- No appreciable difference in performance using either three conductor or four conductor connector.

# Conclusions



- Technic provided and discussed allows for the use of unshielded components in a shielded link segment.
  - Eliminates ANEXT spike anomalies.
    - Independent of link segment configuration.
    - Reduced dependence of termination workmanship.
  - Promotes use of Alien Crosstalk limits that are not link length dependent.
- Does the group feel a need to study effects on TCL and ELTCTL proposed limits?