Screening Attenuation, and Cross Talk Limit, Continued Discussion on Proposals

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Past Presentation and Discussion

- An original proposal was done at the November 12, 2024 802.3dm Plenary.

https://www.ieee802.org/3/dm/public/1124/boyer_sharma-3dm_xx_11-12-24.pdf

- Since that plenary in Nov. 2024, more information has been gathered and analyzed and we have a new proposal.
- Proposing only for coaxial links. Shielded differential pair links will use the same requirements for screening and coupling attenuation as is published in clause 149.
- This proposal is based on the experience gained from installing these links in vehicles.
- The proposal has considered the shielding performance of the existing connectors, cables, and assemblies used in vehicles.
- EMC considerations for both component and vehicle-level testing were incorporated into the proposal.

Proposal for 802.3dm clause 201 ACT Screening Attenuation Coax Link Limit and Connector Comparison for Coax

802.3dm Screening Attenuation Proposal:

- -55 dB (10 to 1000) MHz
- -50 dB (1 to 3) GHz
- -45 dB (3 to 4) GHz

USCAR 17 RF Leakage

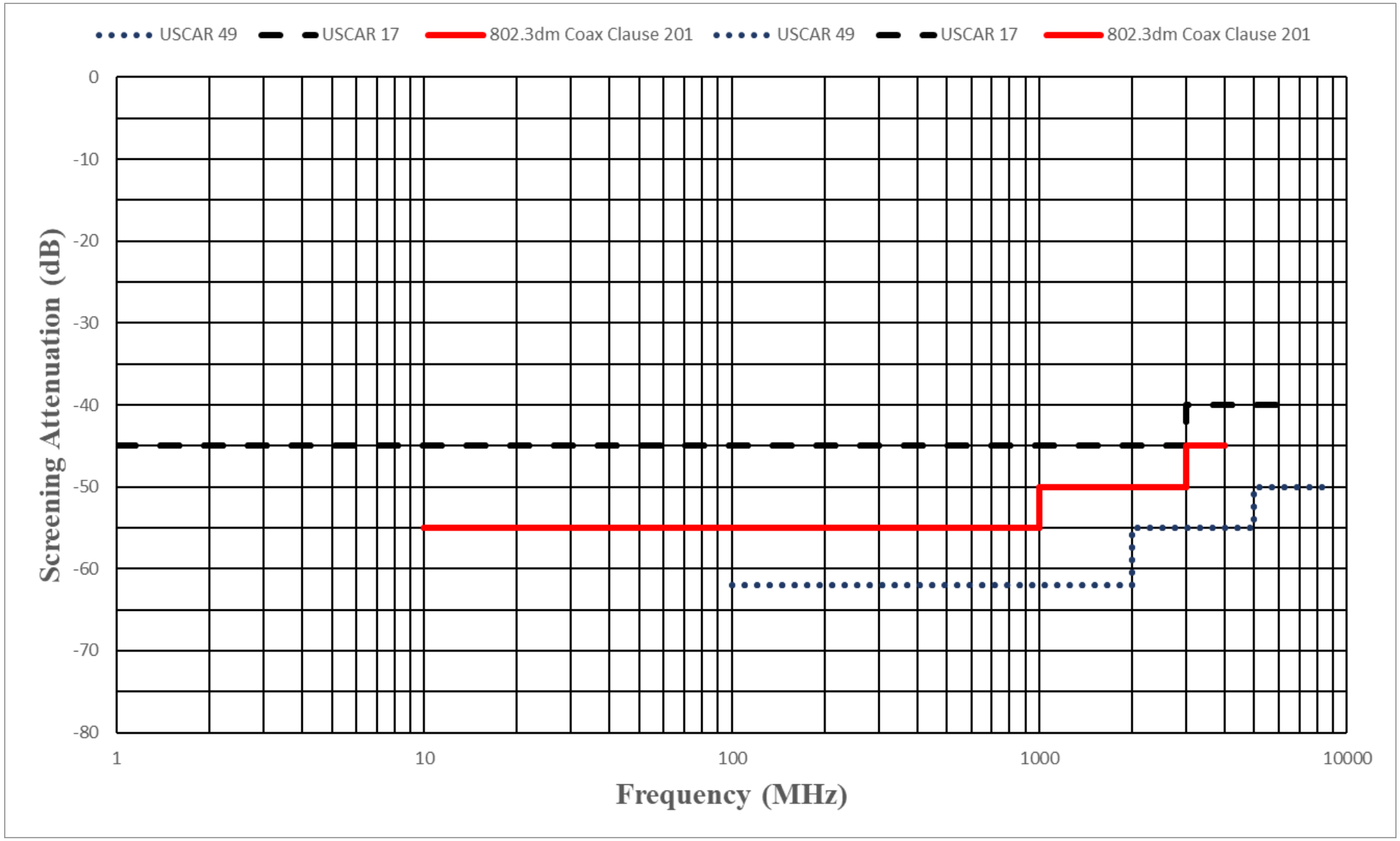
SMB connection systems must not exceed -45 dB throughout the frequency range up to 3 GHz and -40 dB up to 6 GHz.

USCAR 49 Screening Attenuation

Frequency (MHz)	Screening Attenuation (dB)
100 - 2000	≤-62
>2000 - 5000	≤-55
>5000 - 9000	≤-50

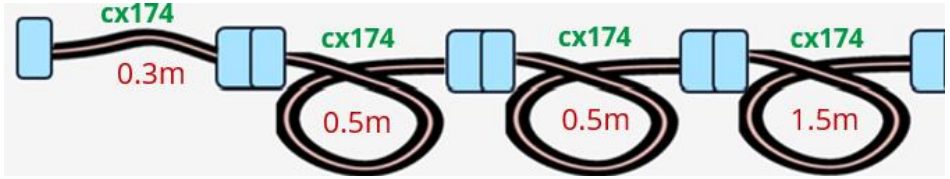
If these limits are considered doable, data will be presented showing applicability of FAKRA (USCAR 17).

Proposal for 802.3dm clause 201 ACT Screening Attenuation Coax Link Limit and Connector Comparison for Coax

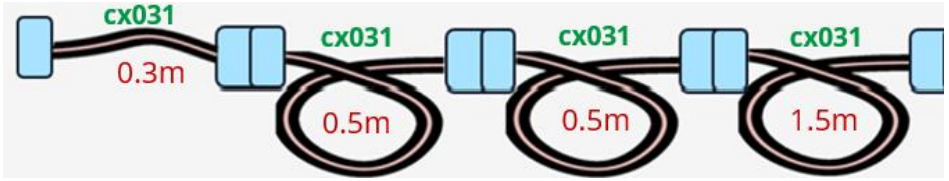


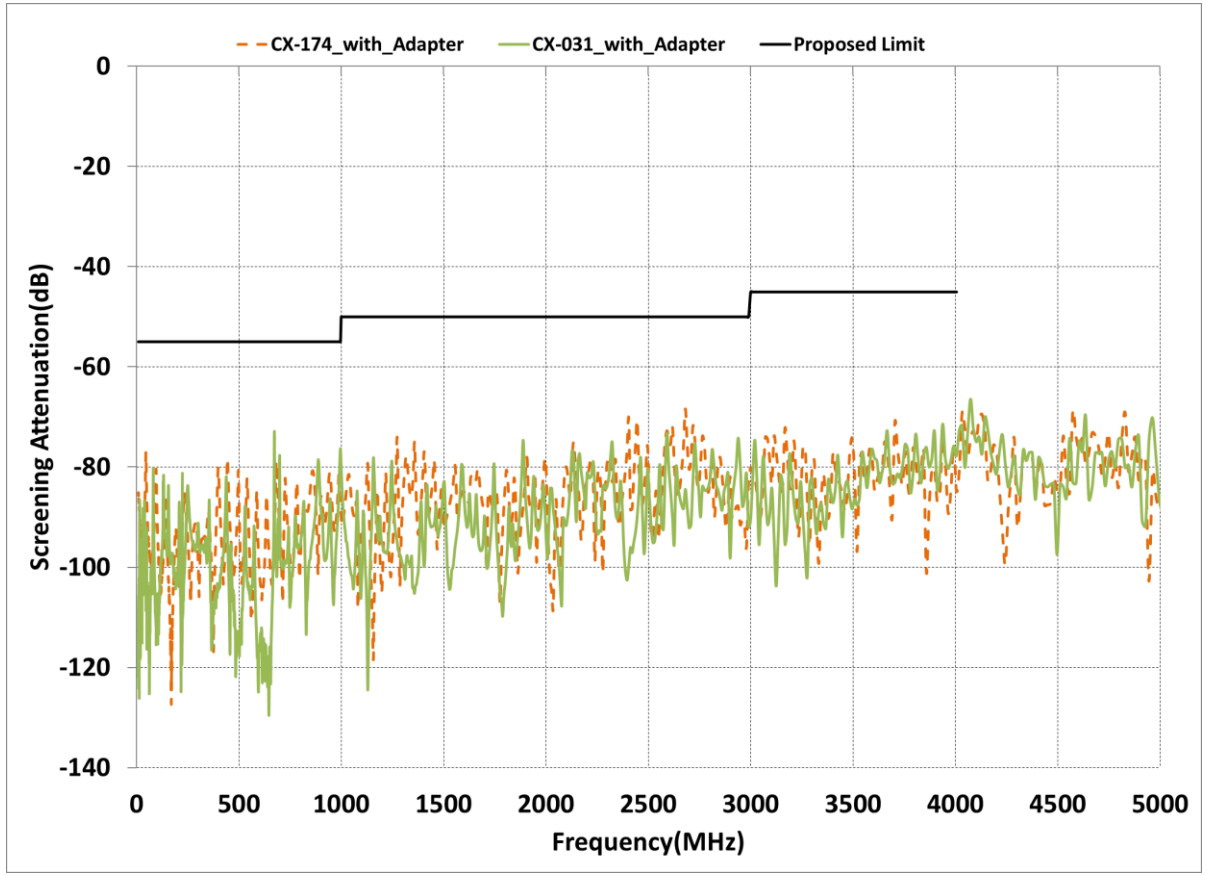
Measurement (At Room Temperature)

CX-174



CX-031





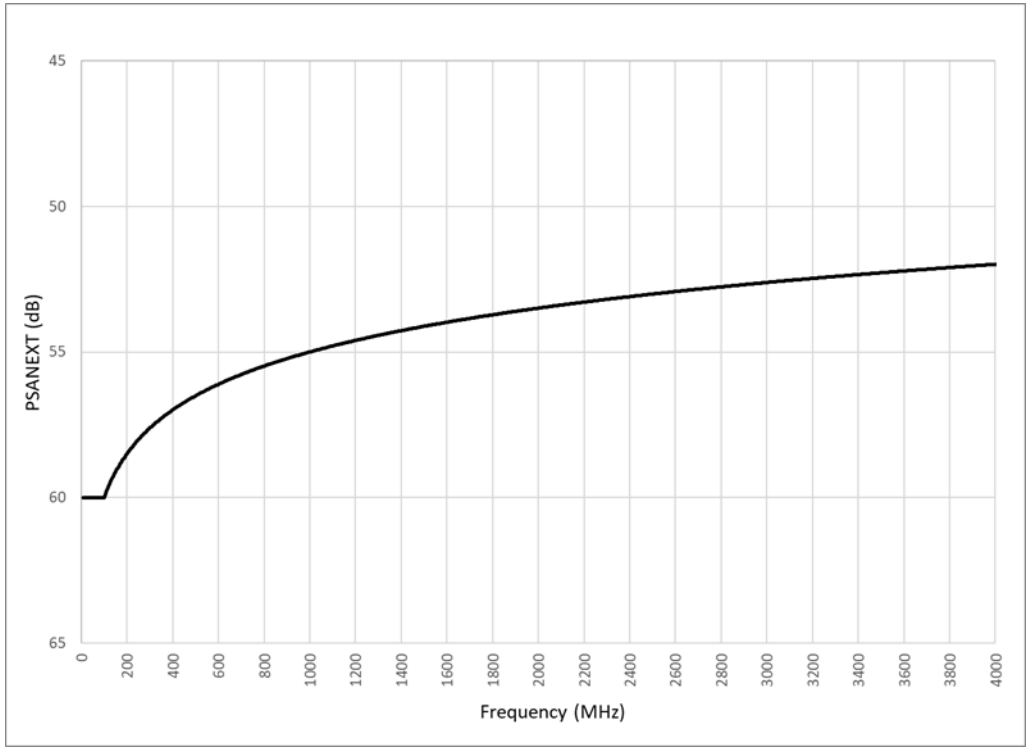
Connector & Mated Inline
(USCAR-49 Connections)

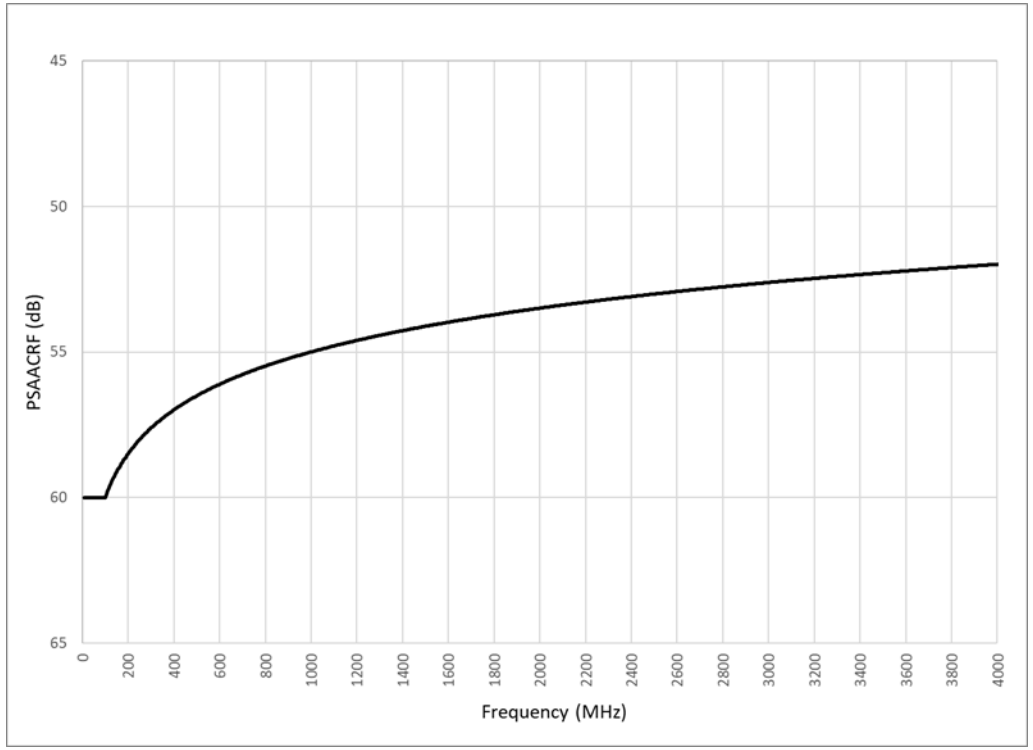
Latest proposal for 802.3dm clause 201 ACT PSANEXT loss and PSAACRF Coax Link

- **201.12.2.1 Power sum alien near-end crosstalk (PSANEXT)**
  - PSANEXTloss(f) ≥ min(60, 60-5$\log_{10}$(f/100) dB
  - where f is the frequency in MHz; 10 ≤ f ≤ 4000

- **201.12.2.2 Power sum alien attenuation to crosstalk ratio far-end (PSAACRF)**
  - PSAACRF(f) ≥ min(60, 60-5$\log_{10}$(f/100) dB
  - where f is the frequency in MHz; 10 ≤ f ≤ 4000

Latest proposal for 802.3dm clause 201 ACT PSANEXT loss and PSAACRF Coax Link





USCAR 49 XT Requirements

Frequency	NEXT
0.01 GHz < f ≤ 4 GHz	≤60 dB
4 GHz < f ≤ 9 GHz	≤50 dB

- Only for PCB mounted multi-wire connectors.
- Measurements include small section of PCB.
- Details of the PCB layout including but not limited to; board material, stack-up, trace definition, physical dimensions, return plane, and stitching.

Thank You