

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

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Contribution to IEEE 802.3dm March 2026 Plenary in Vancouver, BC

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 5) GHz

USCAR 17 RF Leakage

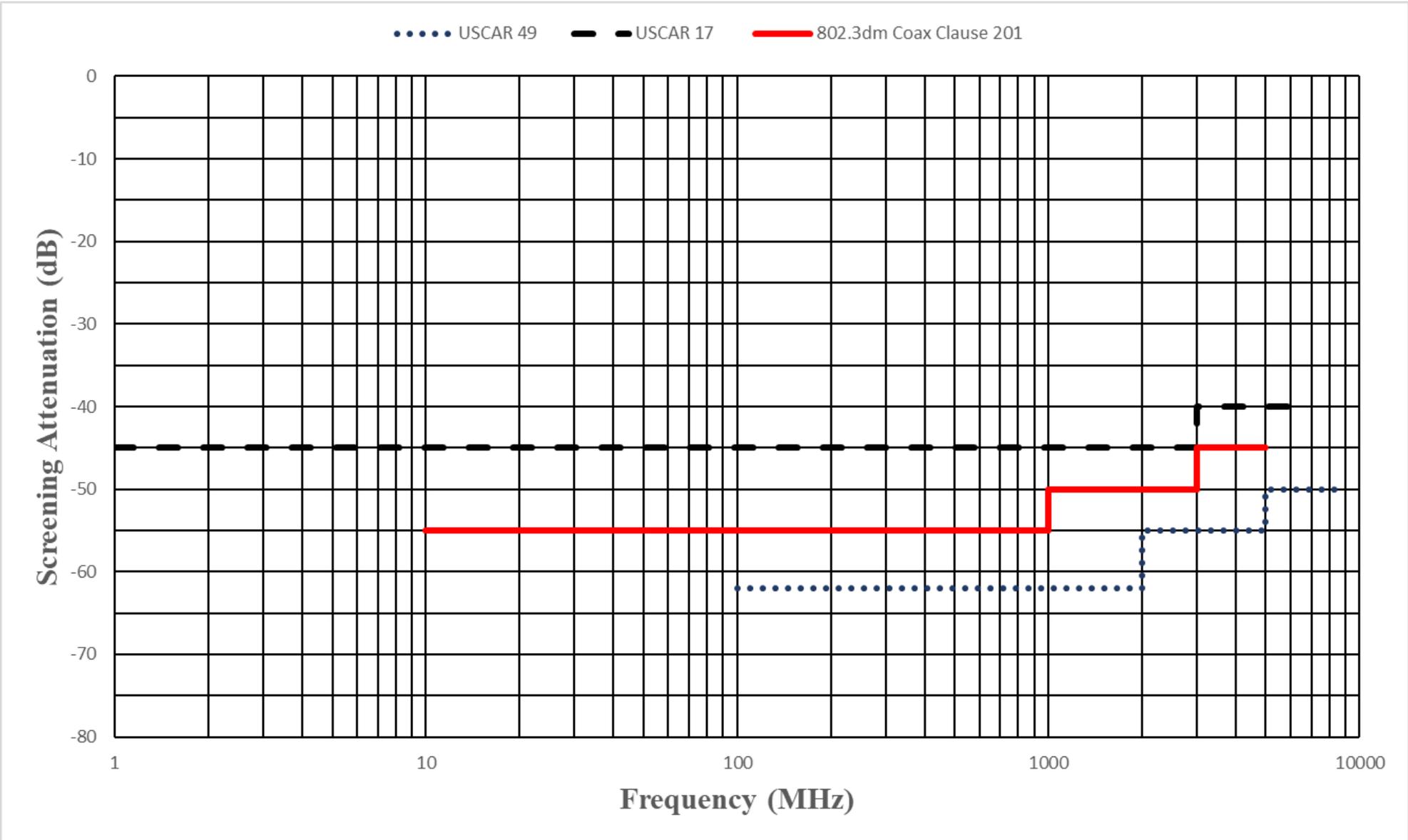
SMB connection systems must not exceed -45 dB throughout the frequency range up to 3 GHz and -40 dB up to 6 GHz.

USCAR 49 Screening Attenuation

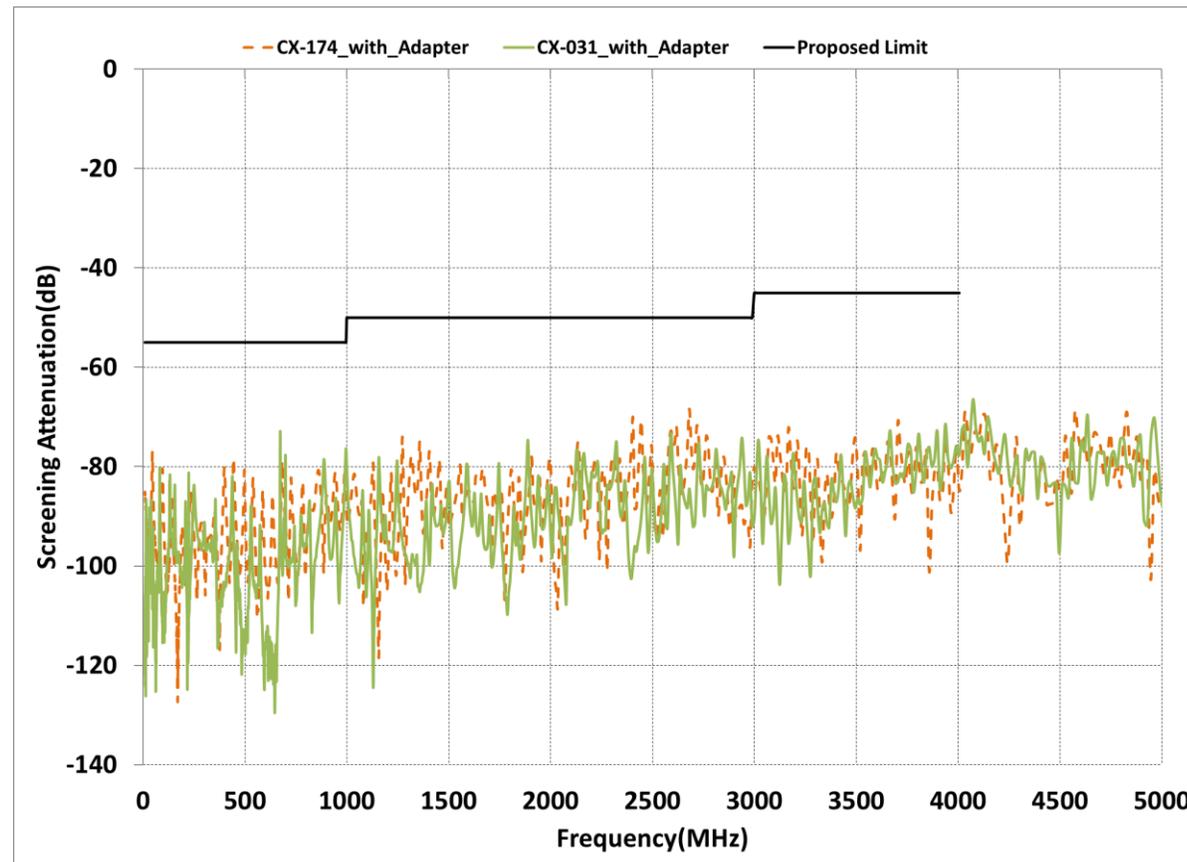
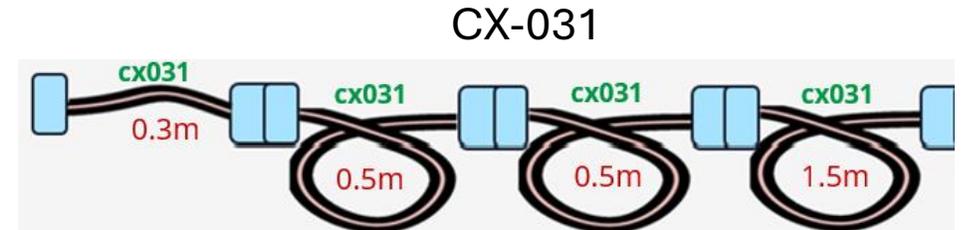
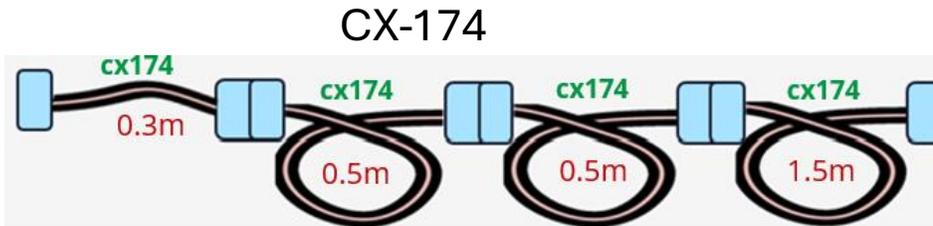
Frequency (MHz)	Screening Attenuation (dB)
100 - 2000	≤ -62
>2000 - 5000	≤ -55
>5000 - 9000	≤ -50

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

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Measurement (At Room Temperature)




Connector & Mated Inline
(USCAR-49 Connections)

Consider measuring surface transfer impedance (STI) from 10 kHz to 100 MHz for the PoC applications

- There are locations within vehicle that this characteristic is important.
- The requirement would be based on link location within vehicle architecture.
- Measurement methodology, specific reference to IEC document.
- Implementations of the test sample length and configurations need to be discussed.
- Understanding how to combine the STI results for multiple link segments within the vehicle.
- Want to get a feel if this is something the group feels is of value.

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

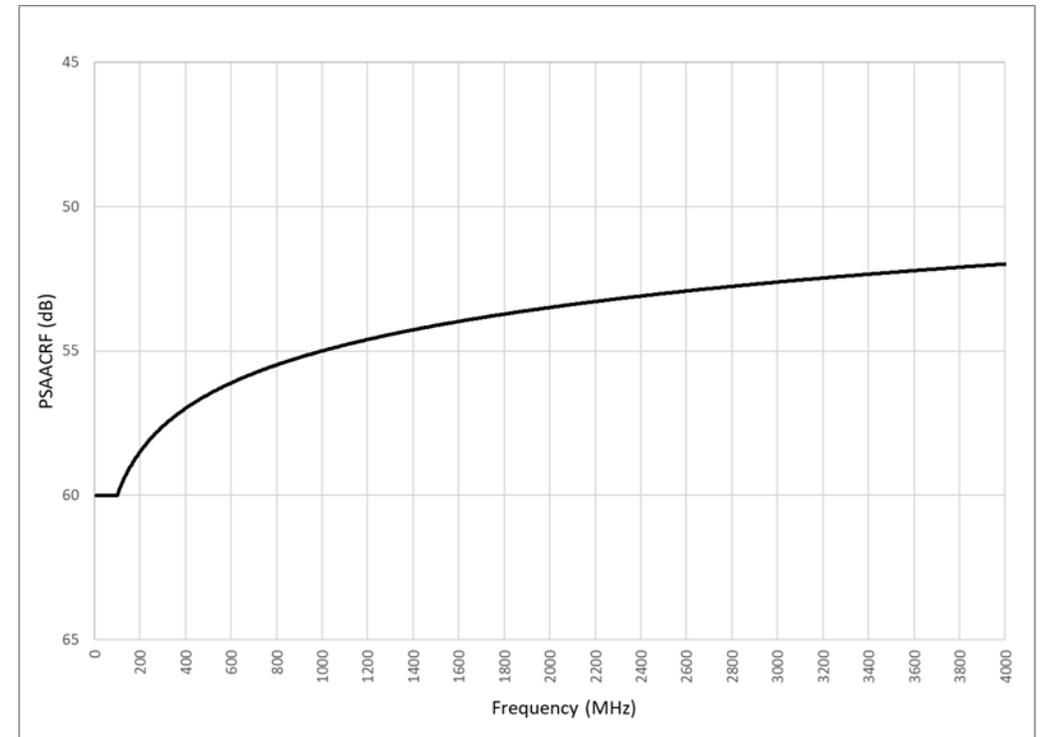
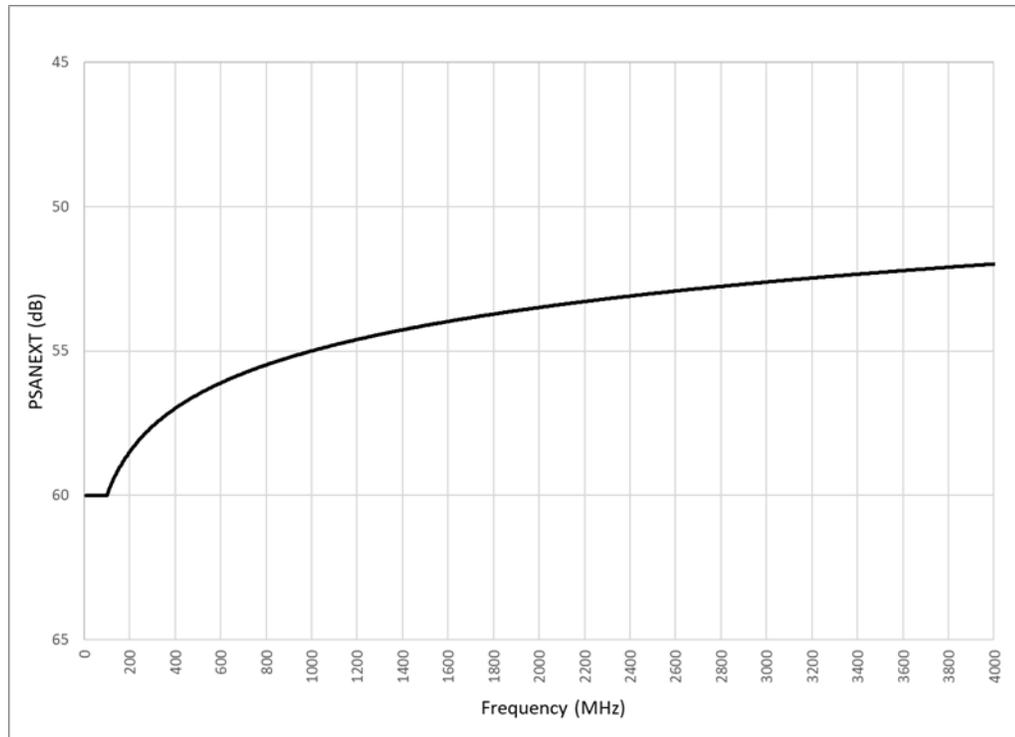
- **201.12.2.1 Power sum alien near-end crosstalk (PSANEXT)**

- $\text{PSANEXTloss}(f) \geq \min(60, 60 - 5\log_{10}(f/100)) \text{ dB}$
- where f is the frequency in MHz; $3 \leq f \leq 4000$

- **201.12.2.2 Power sum alien attenuation to crosstalk ratio far-end (PSAACRF)**

- $\text{PSAACRF}(f) \geq \min(60, 60 - 5\log_{10}(f/100)) \text{ dB}$
- where f is the frequency in MHz; $3 \leq f \leq 4000$

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



USCAR 49 XT Requirements

Frequency	NEXT
$0.01 \text{ GHz} < f \leq 4 \text{ GHz}$	$\leq 60 \text{ dB}$
$4 \text{ GHz} < f \leq 9 \text{ GHz}$	$\leq 50 \text{ dB}$

- 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