802.3ch Cable Modeling

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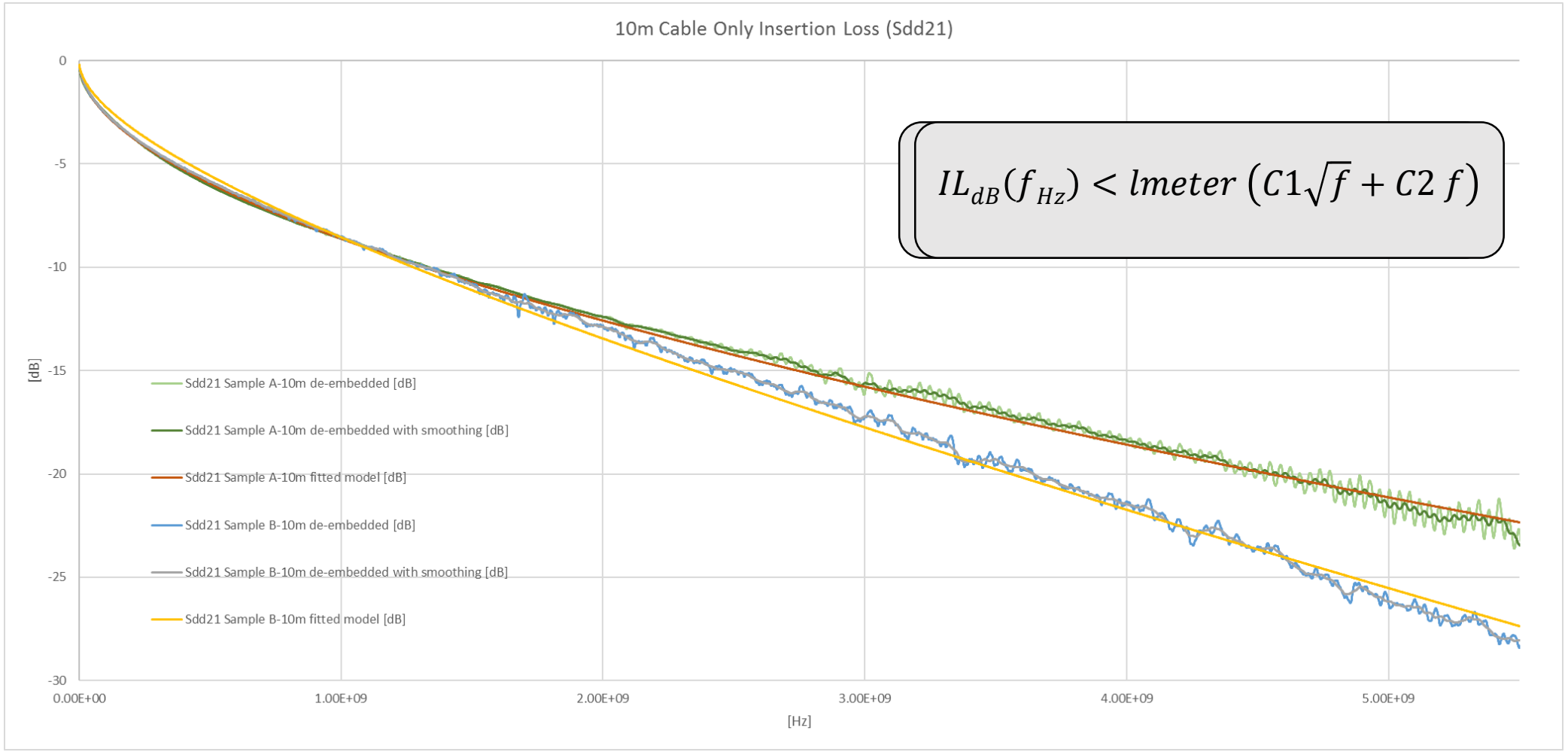
IEEE 802.3ch Tx-Rx Channel Ad Hoc

Cable Modeling Parameters (Differential Pair)

http://www.ieee802.org/3/ch/public/may18/DiBiaso_3ch_01_0518.pdf



Cable A

C1 = -2.5898e-5
C2 = -6.7924e-11
Vp = 2.16e8

Cable B

C1 = -1.97042e-5
C2 = -2.31881e-10
Vp = 2.16e8

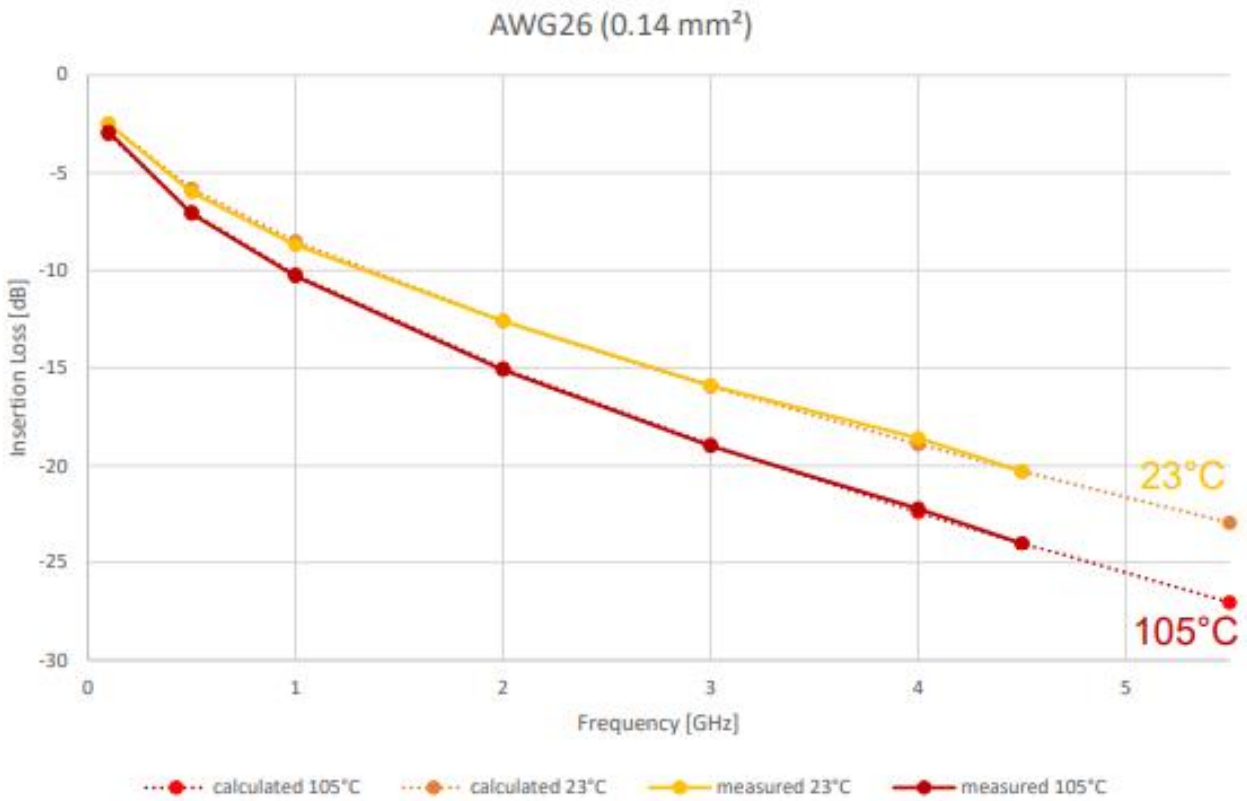
Both cables are 26AWG, but vary in construction

http://www.ieee802.org/3/ch/public/may18/mueller_3ch_01_0518.pdf

802.3ch channel performance

Cable Insertion Loss

10 m cable only AWG26 (0.14 mm²) at 23°C and 105°C



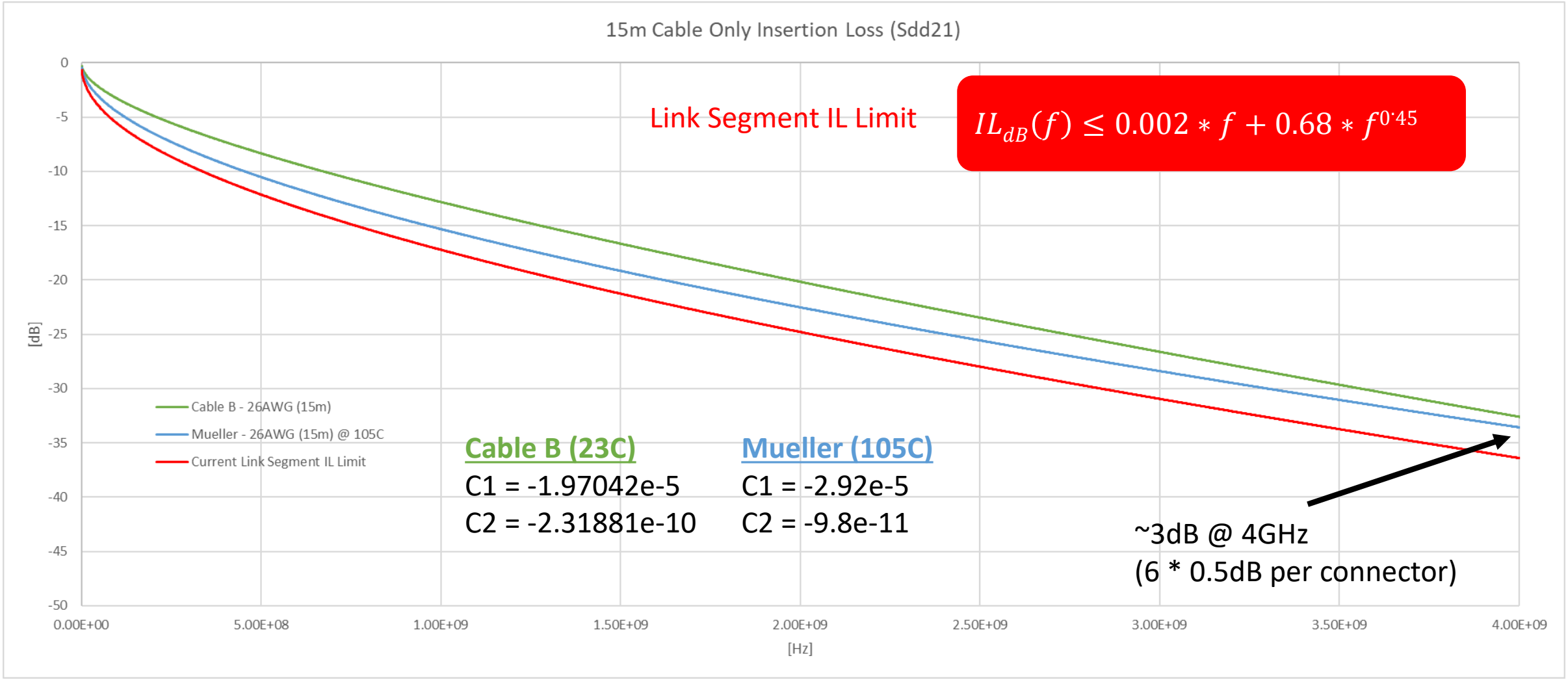
23°C	105°C
C1 = 0.759	C1 = 0.924
C2 = 0.094	C2 = 0.098

$$A = P \cdot (C_1 \sqrt{f_{GHz}} + C_2 \cdot f_{GHz})[dB]$$

where f_{GHz} is the frequency in GHz.

- Cable parameters C1 and C2 fitted to match measurement

Cable Only Models vs. Link Segment IL Limit



Recommended Cable Model

$$IL_{dB_{(Cable\ Only)}} = L_{meter} * \left(C1 * \sqrt{f_{Hz}} + C2 * f_{Hz}\right)$$

Where:

C1 = -2.92e-5

C2 = -9.8e-11

- When Length is 15m, cable model compares well to adopted link segment Insertion Loss Limit
- Adequate margin for connector losses is accounted for (~0.5dB per Connector @ 4GHz)

Thank You!!!