802.3cy
Link Segment IL Baseline Proposal

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June 2021

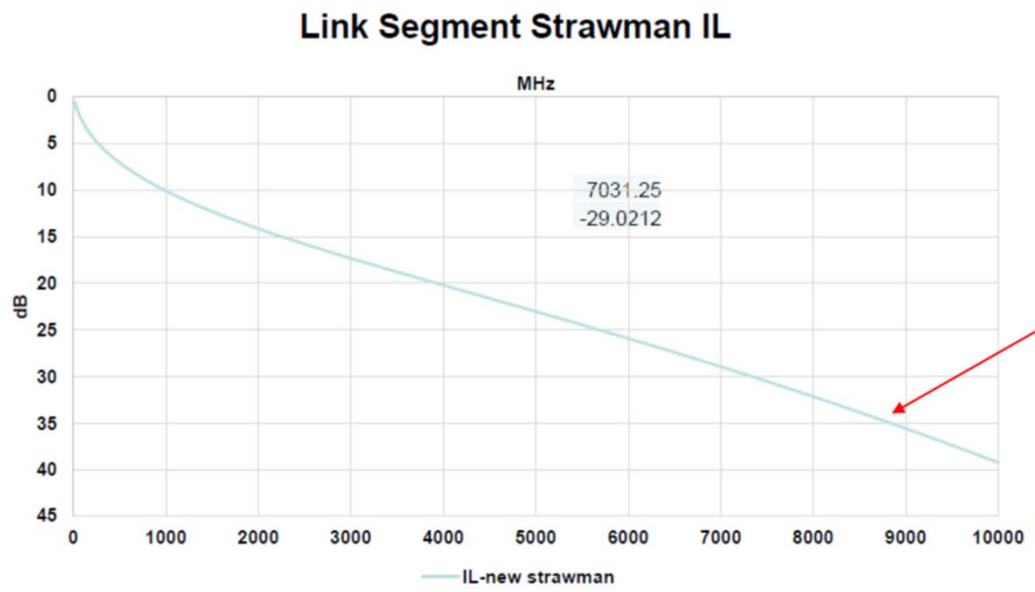
Purpose

- **Link Segment IL Baseline Proposal**

Link Segment IL- Background

The link segment IL strawman was put proposed in the following contribution DiBiaso_et_all_3cy_adhoc_01a_04_20_21. This contribution outlines the history and references all previous contribution that led to this proposal.

Link Segment Strawman IL



Additional Relaxation of IL Limit above 7GHz

*Link Segment IL= -1.2+0.41*SQRT(f_{MHz})-0.00185* f_{MHz} +1.79E-07* f_{MHz} ^2*

*Link Segment IL= -1.2+0.41*SQRT(7031.25)-0.00185* 7031.25+1.79E-07* 7031.25 ^2= ~29 dB*

Fmin = 10MHz

Fmax = 9/10GHz

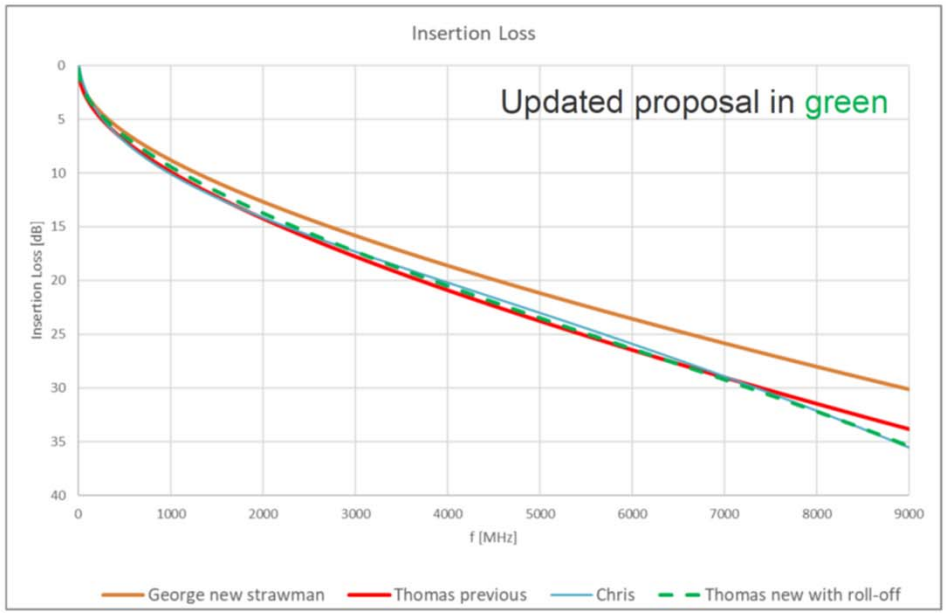
Link Segment IL- Background

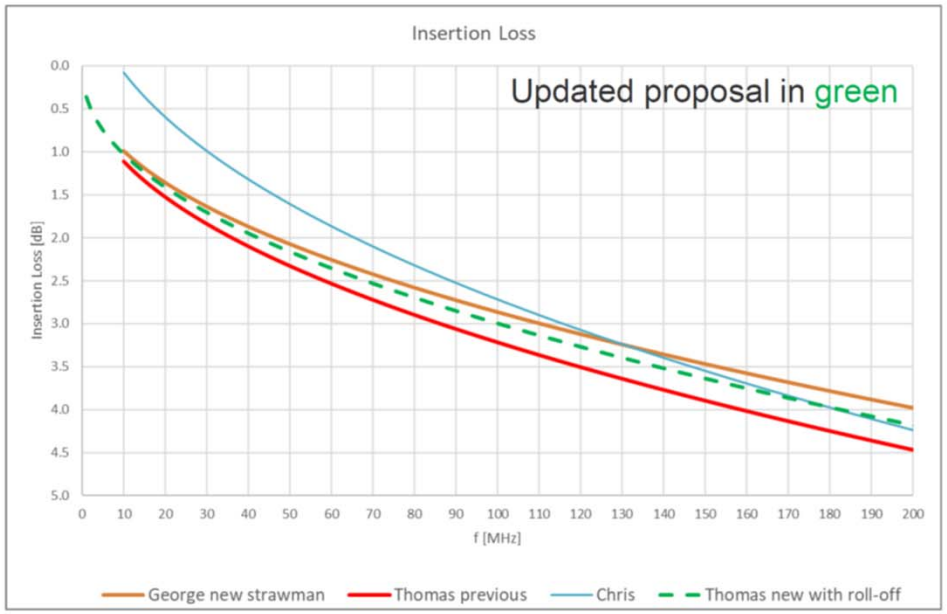
An adjustment to the Link Segment IL proposal was put fourth by Thomas Muller in mueller_3cy_01_05_11_21.pdf

802.3cy link segment insertion loss proposal

$$Insertion\ loss(f) \leq 0.001364f + 0.36 \times f^{0.45} + \frac{0.5 \times f^6}{7500^6}(dB)$$

$$where\ f\ is\ the\ frequency\ in\ MHz;\ 10 \leq f \leq 9000$$



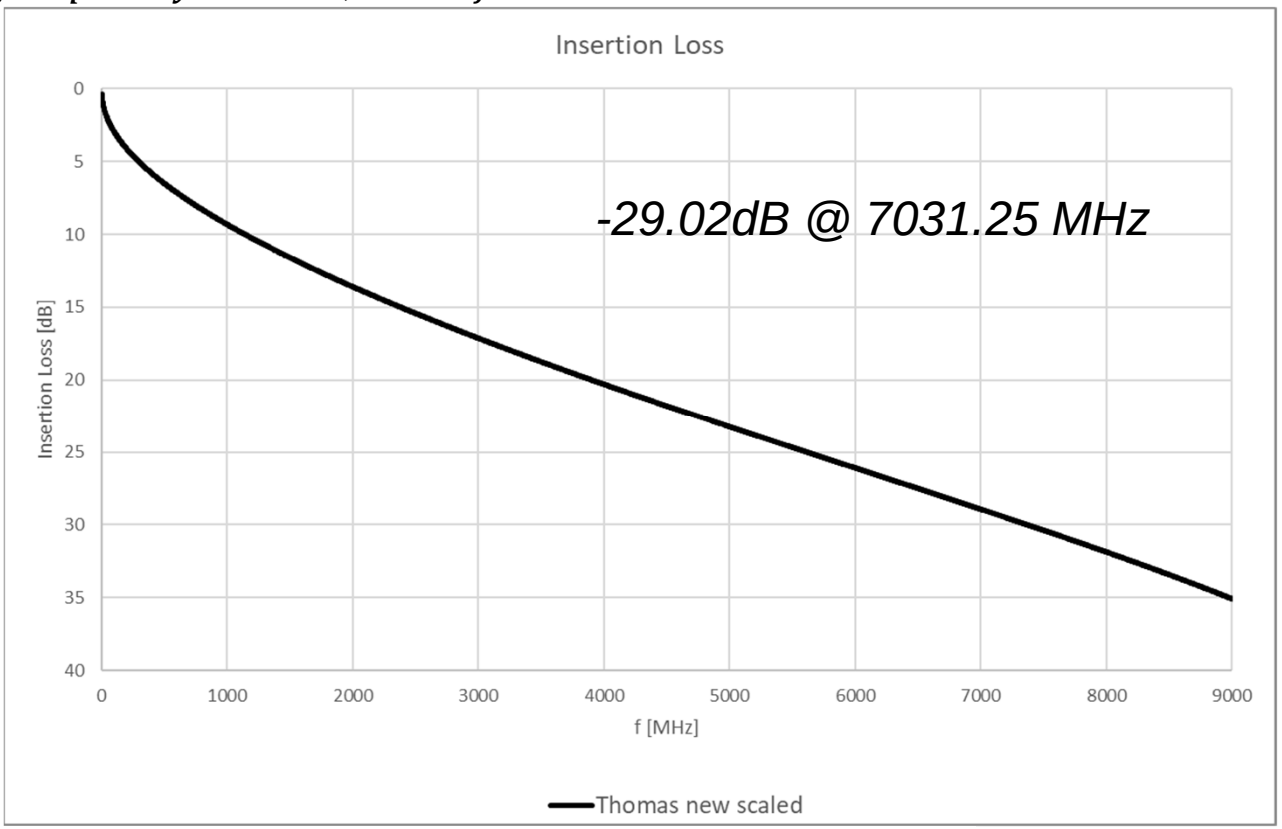


Link Segment IL - Baseline Proposal

An adjustment to the Link Segment IL proposal was put fourth by Thomas Muller in mueller_3cy_01_05_18_21.pdf

$$IL_{LinkSegment}(dB) \leq 0.00135(f_{MHz}) + 0.3564(f_{MHz})^{0.45} + 0.495\left(\frac{f_{MHz}}{7500}\right)^{6}$$

$$where\ f\ is\ the\ frequency\ in\ MHz;\ 10 \leq f \leq 9000$$



Source: diminico_et_all_3cy_01a_05_18_21.pdf

Background - Link Segment IL Margin Discussion

Source: DiBiasoCuesta_3cy_01_06_01_21.pdf – slide 6

Conclusion

- Less than 1.6dB margin to the limit line when entire cable is at 105°C across entire frequency range.
- This margin can increase when only 5 meters of cable is exposed to 105°C.
- This margin can decrease when cable is exposed to heat aging .
- This analysis demonstrates the proposed link segment insertion loss limit seems appropriate and will have minimal margin when an 11 meter 24AWG solid conductor cable is exposed to the automotive environment.

Source: koeppendoerfer_3cy_01_06_01_21.pdf – slide 6

Conclusion

› Based on measurement data (against limit proposal mueller_3cy_01_05_18_21) 9m with an AWG 26 cable is possible

› Based on estimated simulation data (against limit proposal mueller_3cy_01_05_18_21) 11m with AWG 24 is possible

Motion #X:

Move to adopt the link segment insertion loss limit slide 5 (diminico_et_all_3cy_01_06_22_21.pdf).

M: Chris DiMinico S: Haysam Kadry
Technical >= 75%
Y: N: A:
Motion