

Power over Coax and single inductor options

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Supporters

- Takahiro Yamanaka (Murata)

Motivation

- Several contributions have considered single inductor options for ADAS cameras Power over Coax (PoC) circuits
- Several contributions have discussed MDI Return Loss limits
- This presentation provides options and measurement results for single inductor solutions
- This presentation discusses MDI Return Loss limits

Content

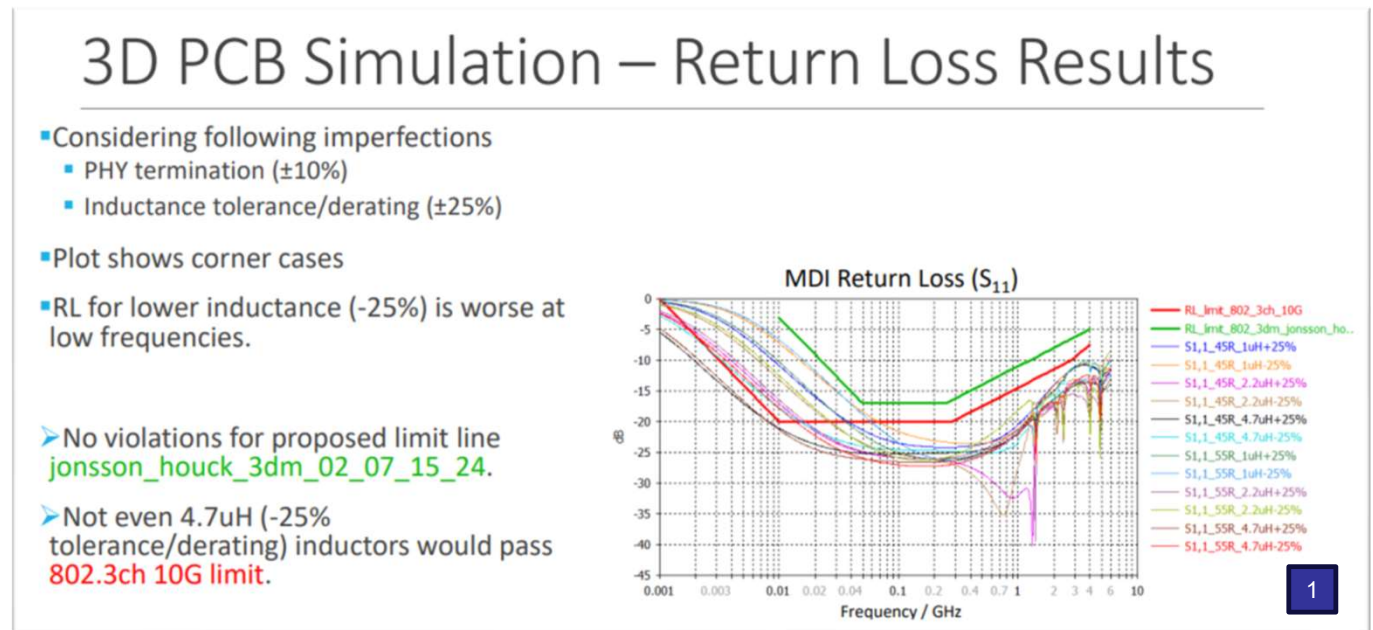
- Referenced contributions
- Measurement specs
- Measurement results
- Conclusion

Referenced Contributions

- https://www.ieee802.org/3/dm/public/adhoc/101024/strohmeier_dm_measure_sim_rl_101024_v03.pdf
- https://ieee802.org/3/dm/public/0724/jonsson_houck_3dm_02_07_15_24.pdf
- https://ieee802.org/3/dm/public/0924/Chini_Tazebay_3dm_01a_0924.pdf
- https://ieee802.org/3/dm/public/0924/jingcong_dm_2024Sep_v2.pdf

Return Loss Results for comparison

- The presentation from Heiko Strohmeier showed simulation results: 1
- Violation of 802.3ch 10G limit line
- No violation for proposed limit line 2



- (1) https://www.ieee802.org/3/dm/public/adhoc/101024/strohmeier_dm_measure_sim_rl_101024_v03.pdf
- (2) https://www.ieee802.org/3/dm/public/0724/jonsson_houck_3dm_02_07_15_24.pdf

Specs used in this presentation

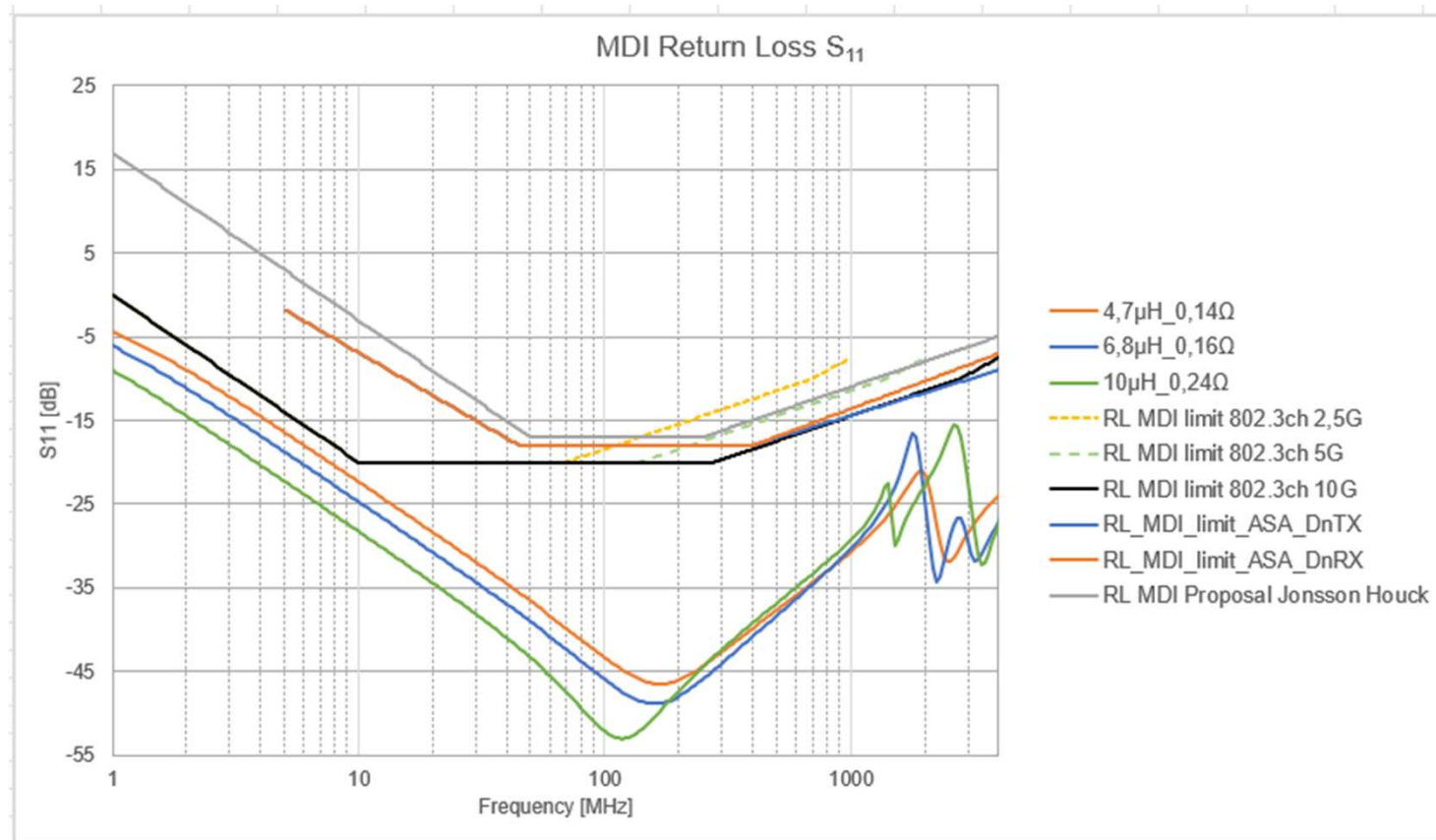
- Specs of inductors with improved behavior

Type	Inductance (μH)	DC resistance (Ω max)	Rated current I_{dc1} (mA) ^{*1}	Rated current I_{dc2} (mA) ^{*2} @105C	Rated current I_{dc2} (mA) ^{*2} @125C
1	4,7 +/-20%	0,14	900	900	630
2	6,8 +/-20%	0,16	700	850	600
3	10 +/-20%	0,24	600	650	460

*1: When applied rated current to the products, Inductance will be within $\pm 30\%$ of nominal Inductance value

*2: When applied rated current to the Products, temperature rise caused by self-generated heat shall be limited to 40°C max.

MDI Return Loss S_{11}



Measured with Vector Network Analyzer (VNA)

Conclusion

- The presented inductor options show a higher margin to 802.3ch 10G limit line
- The presented inductor options match very well to ASA MDI Return Loss limit line
- The presented inductor options will probably match to ASA MDI Return Loss limit line in corner case simulations (not done in this presentation)
- Single inductor solutions are possible regarding ASA MDI Return Loss limit line

Thank You!