Rosenberger

802.3ch screening attenuation measurement results

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802.3ch channel screening attenuation

Overview

- The coupling attenuation baseline on the right side and the measurement setup below was adopted.
- Coupling attenuation is comprised of shielding attenuation and unbalance attenuation .
- In DenBesten_3ch_03_311018.pdf Gerrit asks for an additional shielding attenuation requirement to suppress V_{com} emitted from the PHY.

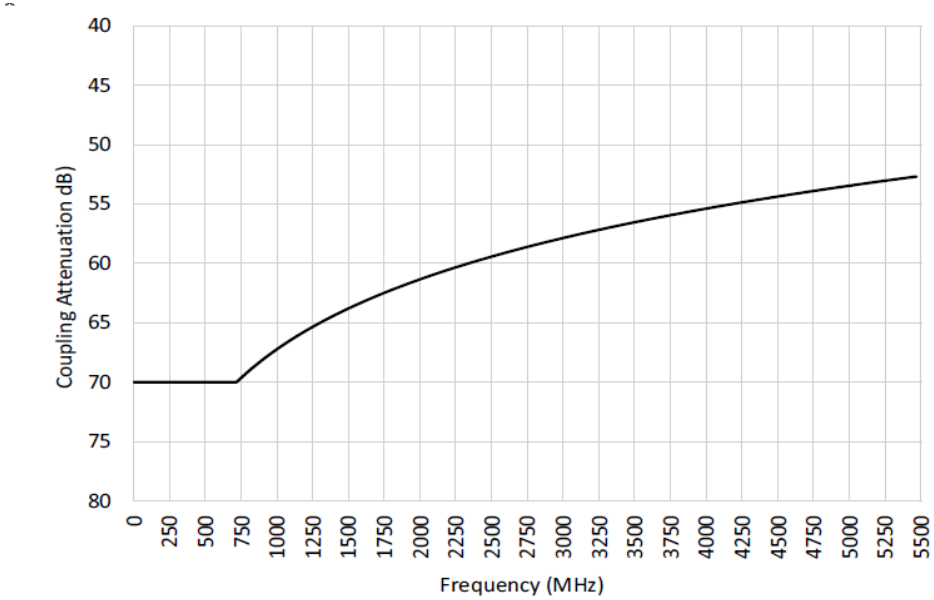
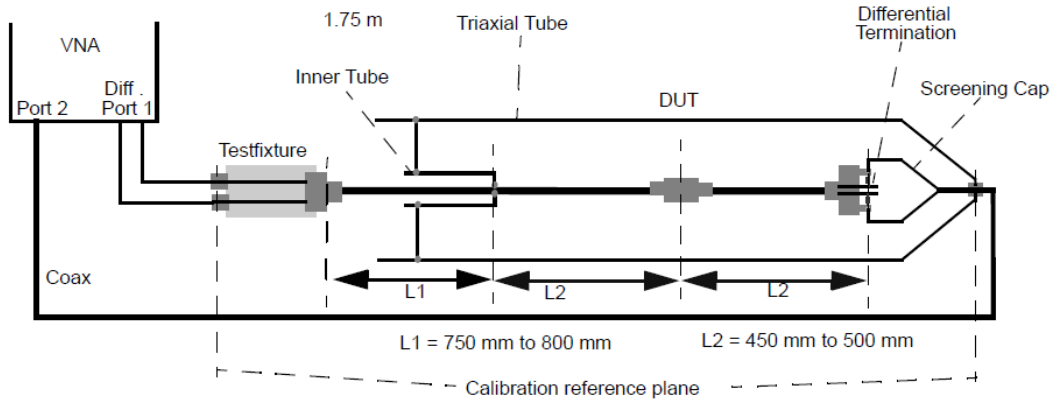


Figure 149–30—Coupling attenuation calculated using Equation (149–17)



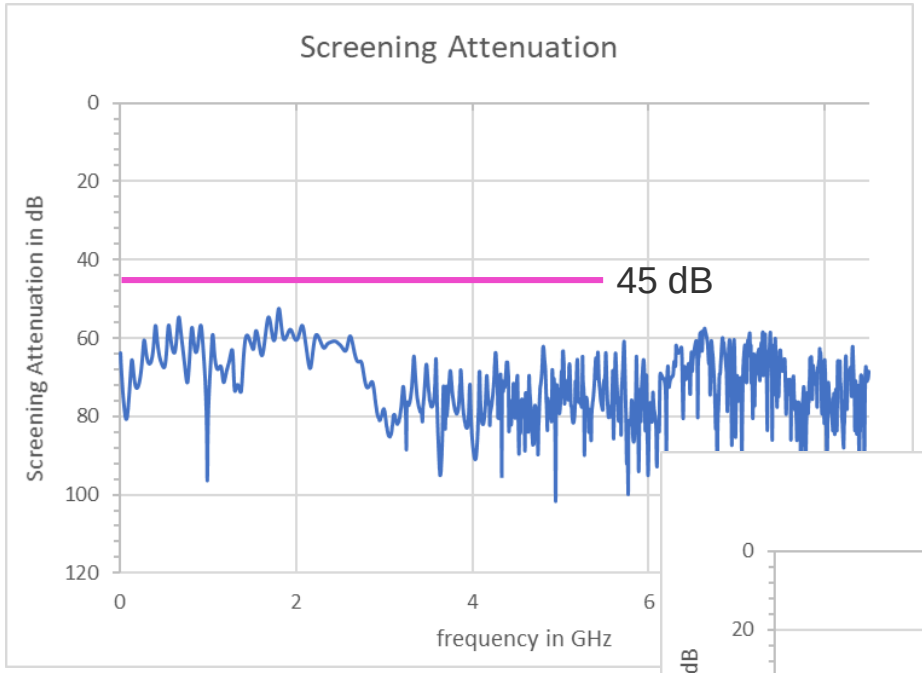
802.3ch channel screening attenuation

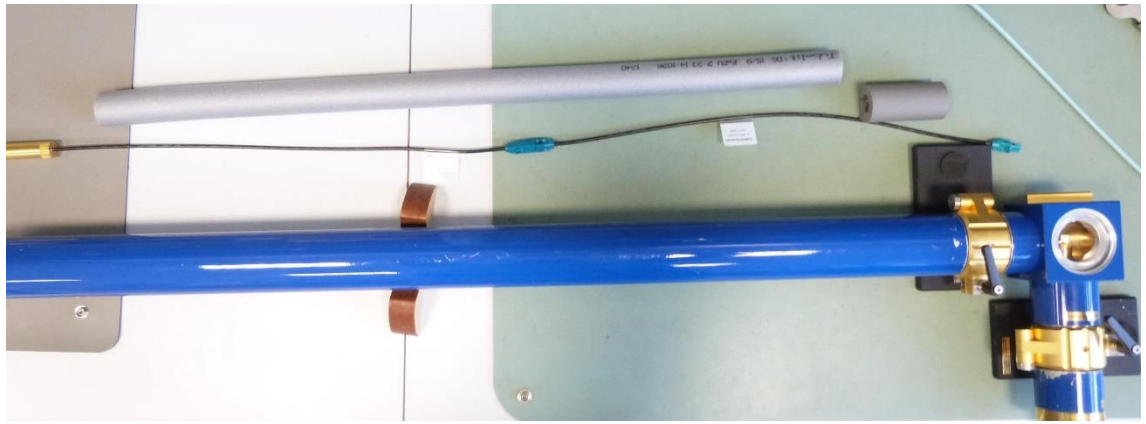
General thoughts in a screening attenuation requirement

- At the frequency range in focus (≤ 5.5 GHz), typically fully shielded systems need to be used, because the balance above 1 GHz is degraded by tolerances in a twisted cable and MDI with its components.
- With fully shielded systems the major part contributing to the achievable coupling attenuation has to come from the shielding attenuation rather than unbalance attenuation.
- Components with ineffective shielding would most likely fail to pass the coupling attenuation requirement. The existing coupling attenuation baseline implies the use or properly shielded components already.
- Therefor a significant suppression of V_{com} emitted by the PHY is implied in the coupling attenuation limit.
- Instead of adding a shielding attenuation requirement for the link segment also consider adding a max. V_{com} PSD mask for common mode emitted by the PHY or PHY / MDI.

802.3ch channel screening attenuation

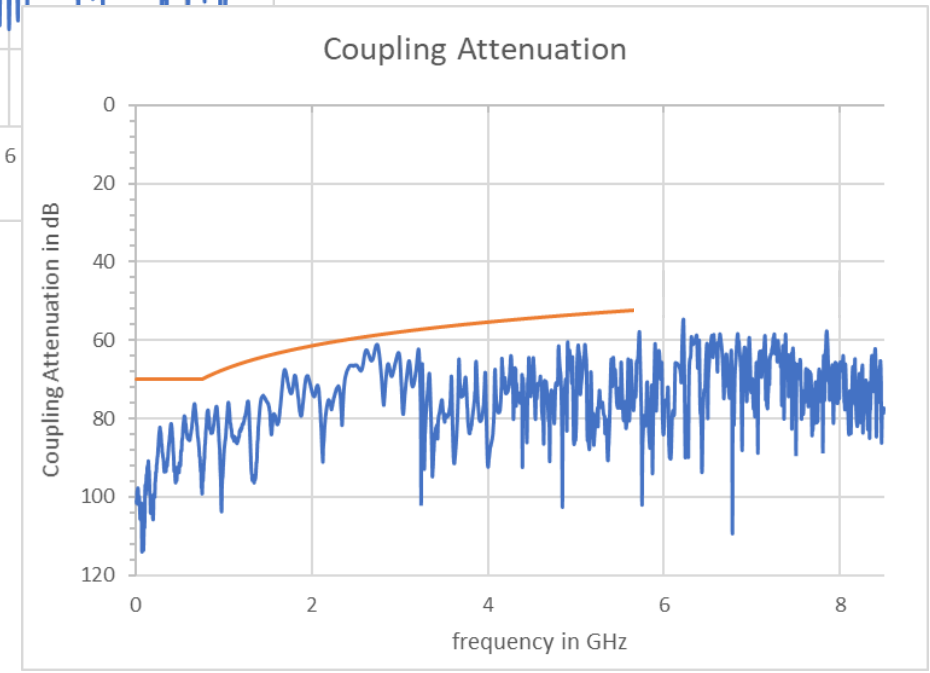
Channel screening attenuation measurement results

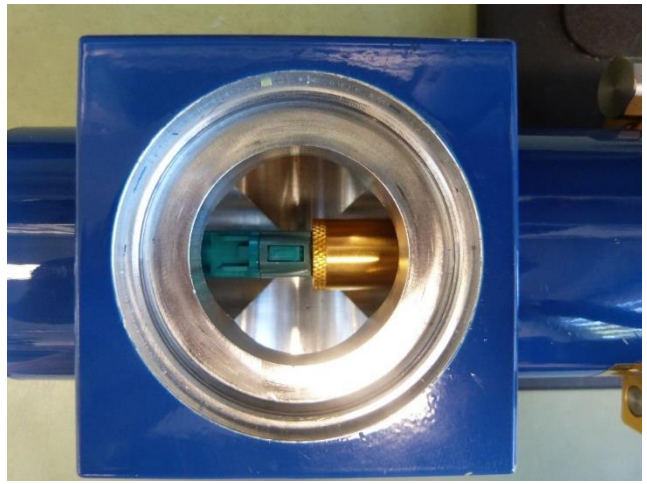




Coupling- and screening attenuation reference cable assembly

connector type 1
cable type 1

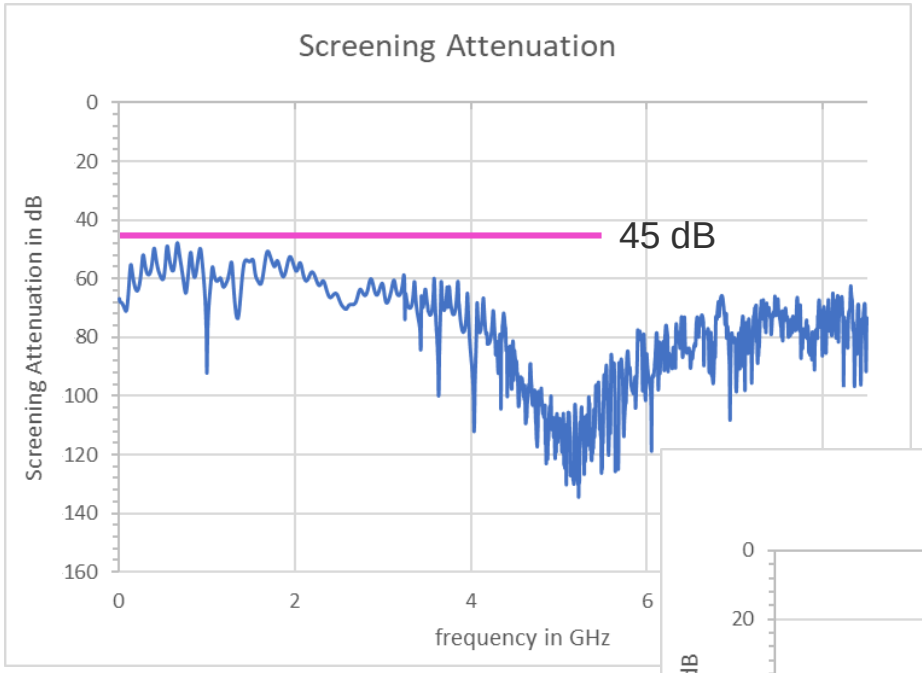




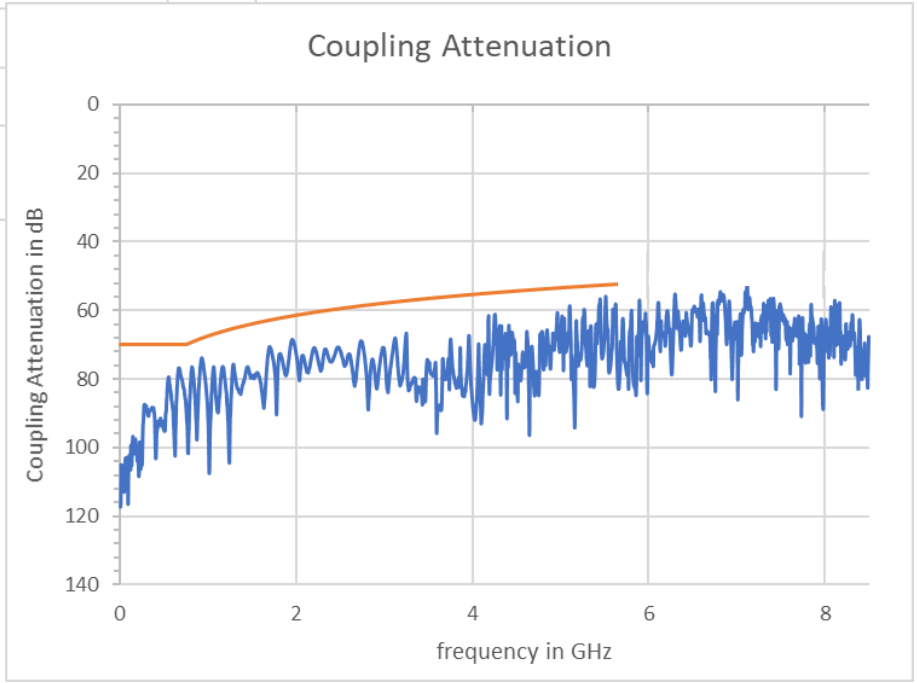
Mated cable. and PCB connector

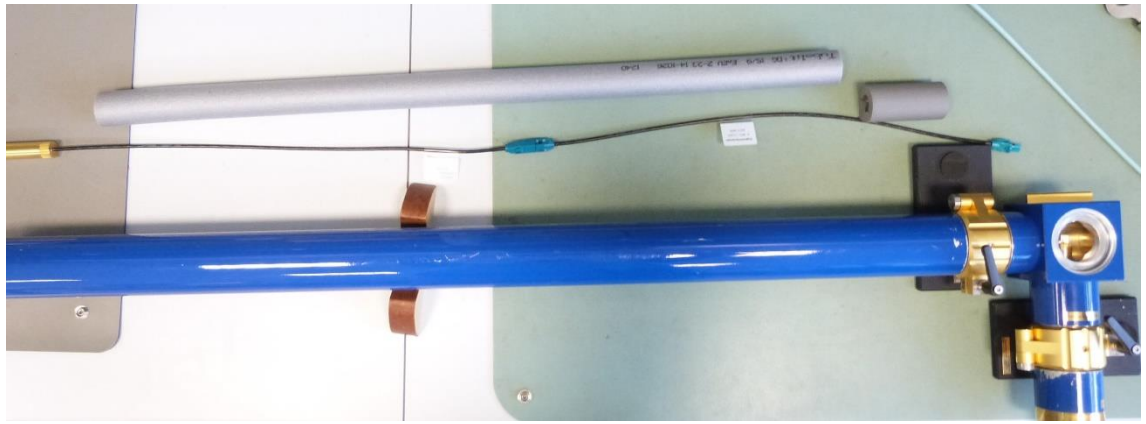
802.3ch channel screening attenuation

Channel screening attenuation measurement results

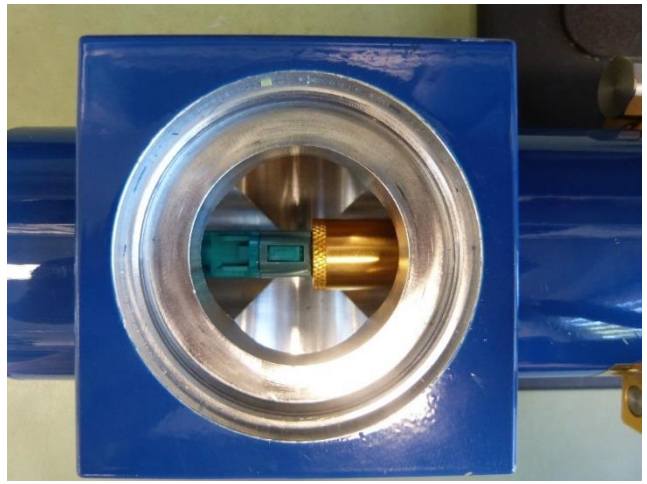


connector type 1
cable type 2





Coupling- and screening attenuation reference cable assembly



Mated cable. and PCB connector

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Summary

- A screening attenuation requirement as requested in DenBesten_3ch_03_311018.pdf would be feasible as follows:

Screening attenuation (f) ≥ 45 for $30 \leq f < 5500$ (dB) where f is the frequency in MHz

- Other measures to limited emitted common mode noise from the PHY may be considered.