# Peak to Peak Transmit Voltage at MDI for TDD based 802.3dm Proposal

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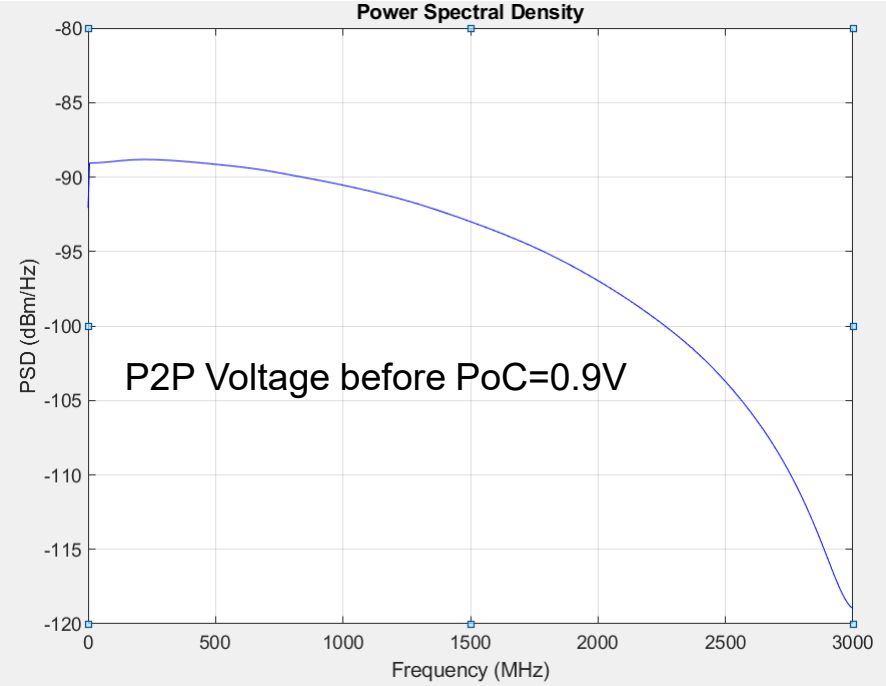
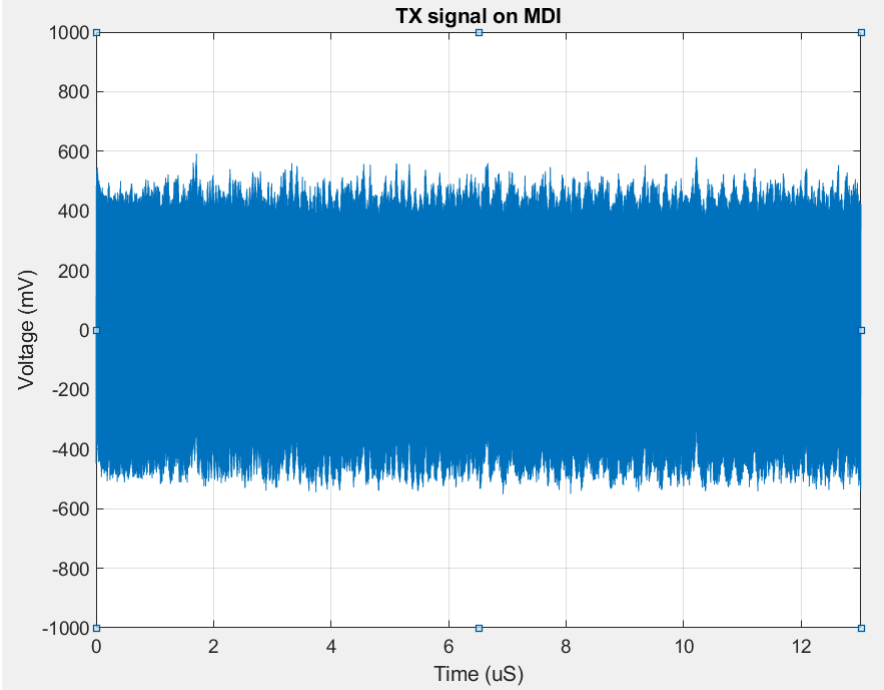
# Foreword

- Maximum Peak to Peak transmit voltage at MDI is estimated  by simulation for TDD proposal.
- The Max Voltages corresponds to max PSD at a given transmit baud rate and highest PoC high pass filtering of 7MHz. Higher bandwidth high pass filter would fail MDI RL.
- The peak-to-peak Voltage at MDI depends on the run length. Assumed 33bit run length for Voltage calculation, although theoretically speaking, run length is not limited.

# 2.5G+100M and 100M+MultiGig over STP

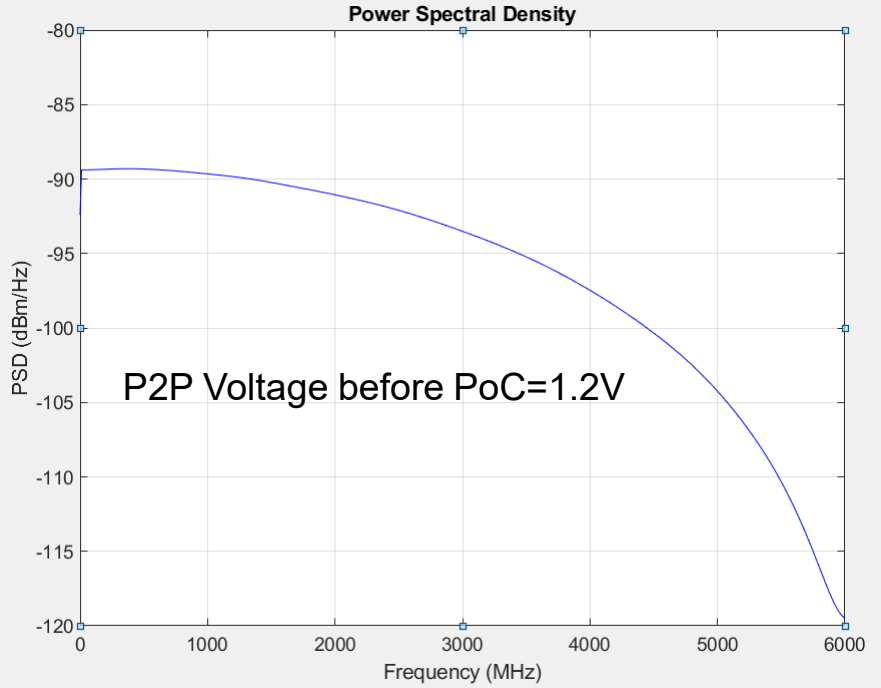


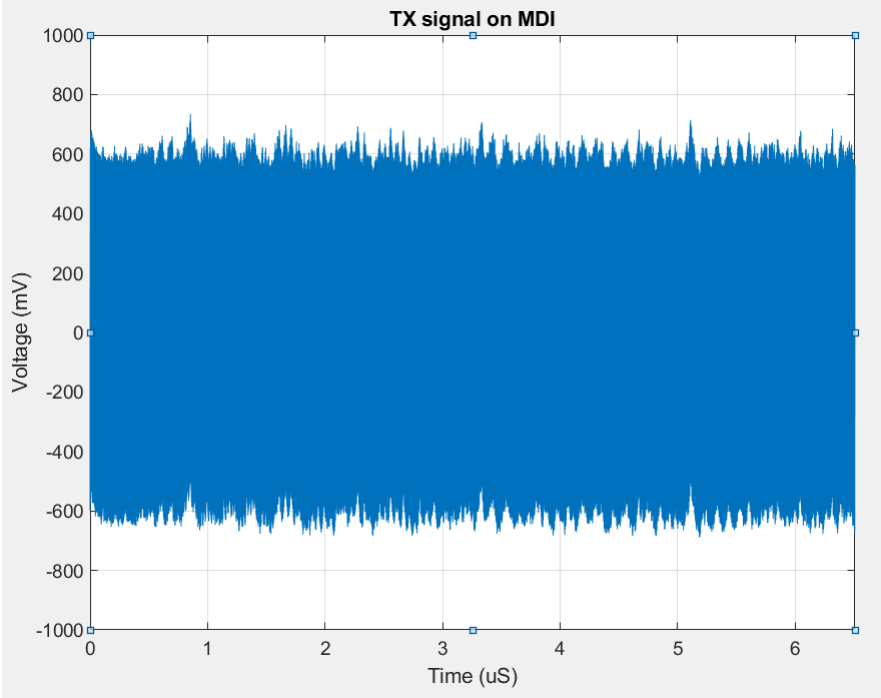




PSD shown with normal mode signal level but with continuous transmission, no quiet gap.

Droop = $1-e^{-t/\tau}$, For 7MHz HPF, $\tau$ = 22.7ns and for t= 33/3GHz =11ns then Droop = 38%
P2P at MDI = 0.9 * 1.38 = 1.24Vpp

# 5G+100M over STP



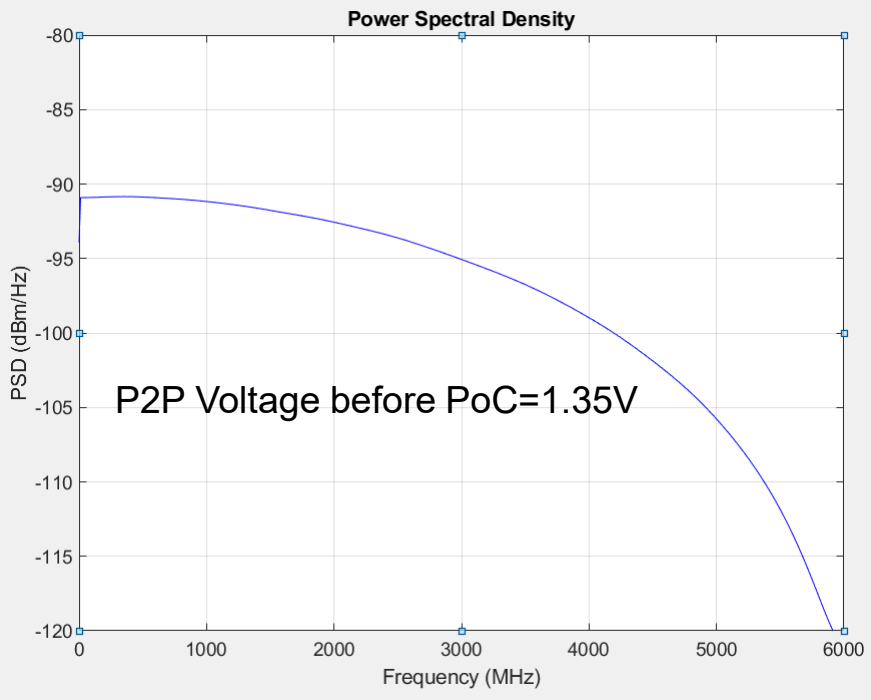




PSD shown with normal mode signal level but with continuous transmission, no quiet gap.

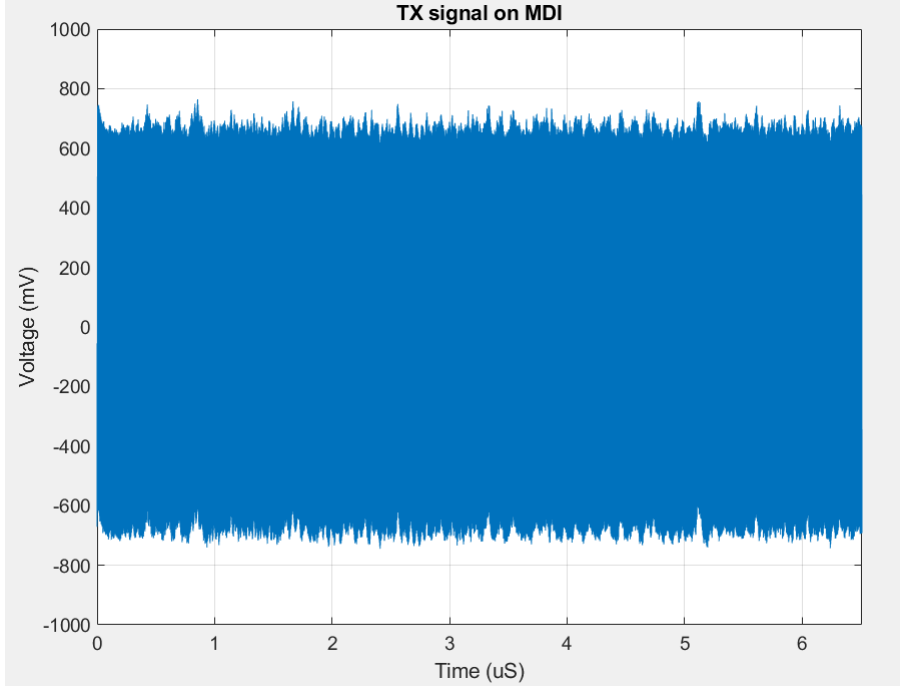
Droop = $1-e^{-t/\tau}$, For 7MHz HPF, $\tau$ = 22.7ns and for t= 33/6GHz =5.5ns then Droop = 22%

P2P at MDI = 1.2 * 1.22 = 1.46Vpp

# 10G+100M over STP




PSD shown with normal mode signal level but with continuous transmission, no quiet gap.




PAM2 Training and PAM4 Normal mode

Droop = $1-e^{-t/\tau}$, For 7MHz HPF, $\tau$ = 22.7ns and for t= 33/6GHz =5.5ns then Droop = 22%

P2P at MDI = 1.35 * 1.22 = 1.65Vpp

# Summary

- Given statistical variation of run length and thus p2p Voltage at MDI, it is recommended that the clause 202.5.2.5 is written as info not a requirement:

When measured with 100 Ω termination for MultiG+100M/100M+MultiGBASE-T1 PHYs, the transmit differential signal at the MDI ~~shall~~ should be less than the peak-to-peak values specified in Table 202–17. When measured with 50 Ω termination for MultiG+100M/100M+MultiGBASE-V1 PHYs, the transmit signal at the MDI shall be less than the peak-to-peak values specified in Table 202–17. The limits in this subclause apply to all transmitted symbol sequences, including SEND_N, SEND_TS, and SEND_TA.

| PHY type | Peak-to-peak (V) | PHY type | Peak-to-peak (V) |
|---|---|---|---|
| 10G+100MBASE-T1 | 1.7 | 10G+100MBASE-V1 | 0.85 |
| 5G+100MBASE-T1 | 1.5 | 5G+100MBASE-V1 | 0.75 |
| 2.5G+100MBASE-T1 | 1.3 | 2.5G+100MBASE-V1 | 0.65 |
| 100M+MultiGBASE-T1 | 1.3 | 100M+MultiGBASE-V1 | 0.65 |