Auto-Negotiation Consideration Under 1TPCE
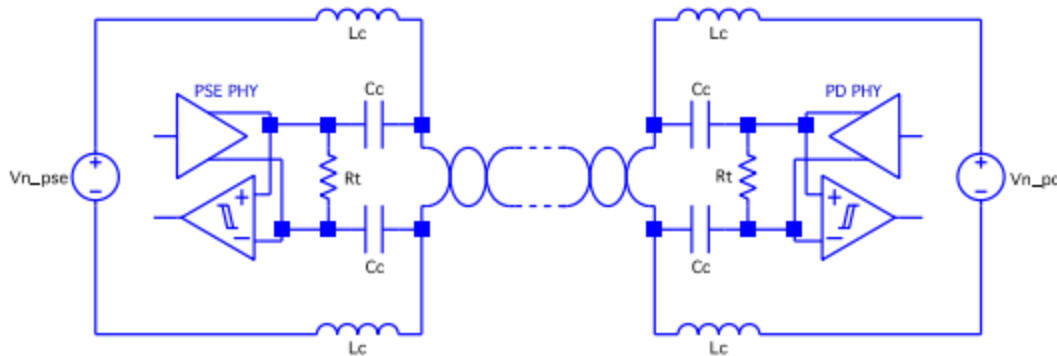
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PoDL Influence on Auto-Negotiation

▸ **PoDL requires high-pass filtering on data path**

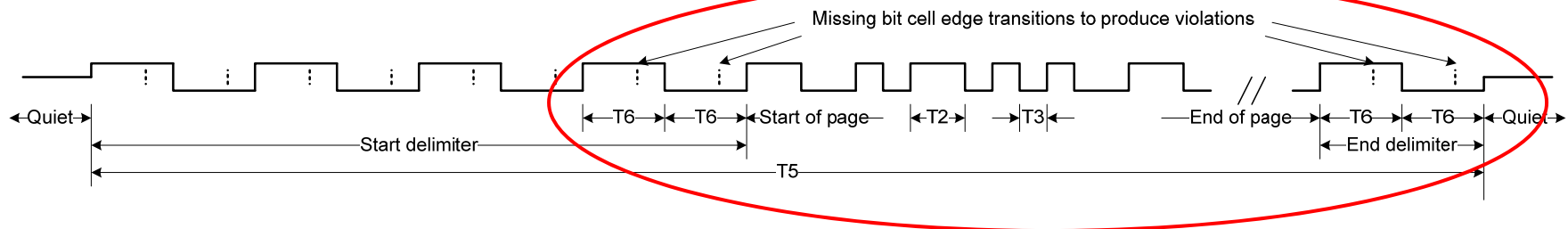Simplified coupling network from dwelley_3bp_01_0314.pdf slide 3

▸ **First order high pass filter with cutoff frequency at 10MHz recommended by xiaofeng_3bp_01_0514.pdf slide 10**

▸ **Auto-Negotiation signaling has to get through this high pass filter**

Auto-Negotiation Signaling

▶ **Use Half Duplex - Differential Manchester Encoding (DME)**

  ▪ **Lo_3bp_04_0314.pdf**

▶ **Circled portion of DME page below agree upon**

Missing bit cell edge transitions to produce violations

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◀T5▶

▶ **Minimum pulse width is T3**

▶ **Max pulse width is T6 = 3 x T3**

▶ **T3 = 10ns (T6 = 30ns) to allow signal to get through high pass filter as suggested by Thaler_3bp_01_0514.pdf**

▶ **T3 = 8ns (T6 = 24ns) to better match 750Mbaud/s 1000BASE-T1 as suggested by Lo_3bp_02a_0714.pdf**

▶ **8ns ok with filter using match filters – McClellan_Lo_3bp_01_0914.pdf**

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Implications for 1TPCE

▸ **Transmitter needs to run 8ns period for Auto-Negotiation which is faster than normal data of 15ns.**

▸ **Cannot slow down T3 = 15ns since two T6 will have 90ns period which will be filtered out by 10MHz high pass filter.**

▸ **Receiver need to be able to sample 8ns pulses**

Possible Solution

▸ **Integrate high pass filters into chip**

▸ **High pass filter is bypassed during auto-negotiations allowing T3 to be greater than 15ns.**

▸ **Need further study on PoDL coupling network effects with integrated high pass filters**

THANK YOU