Tx Function to Rx Function AdHoc Channel RL Considerations

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Purpose

- TX-RX RL Channel considerations

Link Segment (2.5/5/10 Gb/s) – 2.5/5/10GBASE-T1

- Link transmission parameters (up to at least 15 m)
  - Frequency range specified
    - Characteristic impedance
    - Insertion loss - 1 MHz ≤ f ≤ S*fmax MHz
    - Return loss
      - 2.5GBASE-T1 - 1 MHz ≤ f ≤ 1000 MHz
      - 5GBASE-T1 - 1 MHz ≤ f ≤ 2000 MHz – RL mag limit is specified in relationship to IL@1.5 GHz
      - 10GBASE-T1 - 1 MHz ≤ f ≤ 4000 MHz – RL mag limit is specified in relationship to IL@3 GHz
    - Coupling Attenuation - 1 MHz ≤ f ≤ 5500 MHz
    - Shielding Effectiveness - 30 MHz ≤ f ≤ S*fmax MHz
    - Maximum Link Delay - 2 MHz ≤ f ≤ S*fmax MHz

- For 2.5GBASE-T1, 5GBASE-T1, and 10GBASE-T1, the maximum applicable frequency for the Link Segments specifications is 4000 MHz × S. For 2.5GBASE-T1, S = 0.25; for 5GBASE-T1, S = 0.5; and for 10GBASE-T1, S = 1.

MDI – Medium Dependent Interface- RL

- **802.3ch 2.5/5/10GBASE-T1 - MDI connector**
  - **The mechanical interface to the shielded balanced cabling is a 2-pin connector with a shield.**
- **802.3ch 2.5/5/10GBASE-T1 - MDI connector**
  - **Return Loss**
  - **MDI coupling attenuation (place holder)**

$$MDI\_Return\_Loss(f) \le \begin{cases} 20 - 20\left(\log_{10}\frac{10}{f}\right) & 1 \le f < 10 \\ 20 & 10 \le f \le 500 \\ 12 - 10\log_{10}(f/3000) & 500 \le f \le 3000 \\ 12 - 20\log_{10}(f/3000) & 3000 \le f \le 4000 \end{cases} \quad \text{(dB)}$$

where

f is the frequency in MHz.

For 2.5GBASE-T1, 5GBASE-T1, and 10GBASE-T1, the maximum applicable frequency for the MDI return loss is 4000 × *S* MHz. See Table 149–1 for definition of *S*.

MDI/TX/RX electrical specifications

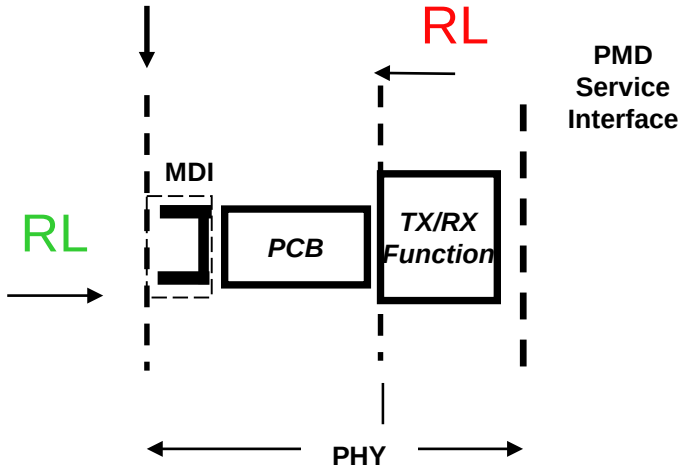

Table 149–1—Scaling parameter

PHY type	*S*
10GBASE-T1	1
5GBASE-T1	0.5
2.5GBASE-T1	0.25

MDI = *PHY is coupled to the cabling at the MDI.*
= MDI requirements: mechanical (to ensure complete compatibility) and electrical.

Channel Return Loss