Header Connectors: How to Consider in NGAUTO

Natalie Wienckowski

October 4, 2017

Definitions

- **1.4.269 Medium Dependent Interface (MDI):** The mechanical and electrical or optical interface between the transmission medium and the MAU (e.g., 10BASE-T) or the PHY (e.g., 1000BASE-T) and also between the transmission medium and any associated (optional per IEEE Std 802.3, Clause 33) Powered Device (PD) or Endpoint Power Sourcing Equipment (PSE).
- **1.4.255 link segment:** The point-to-point full-duplex medium connection between two and only two Medium Dependent Interfaces (MDIs).

802.3bw Definition

96.7 Link segment characteristics

The 100BASE-T1 PHY is designed to operate over a single balanced twisted-pair cabling system. The single balanced twisted-pair cable supports an effective data rate of 100 Mb/s in each direction simultaneously. The link segment for a 100BASE-T1 PHY system is defined as in Figure 96–28, which consists of up to 15 m of single balanced twisted-pair cabling, with up to four in-line connectors and two mating connectors.

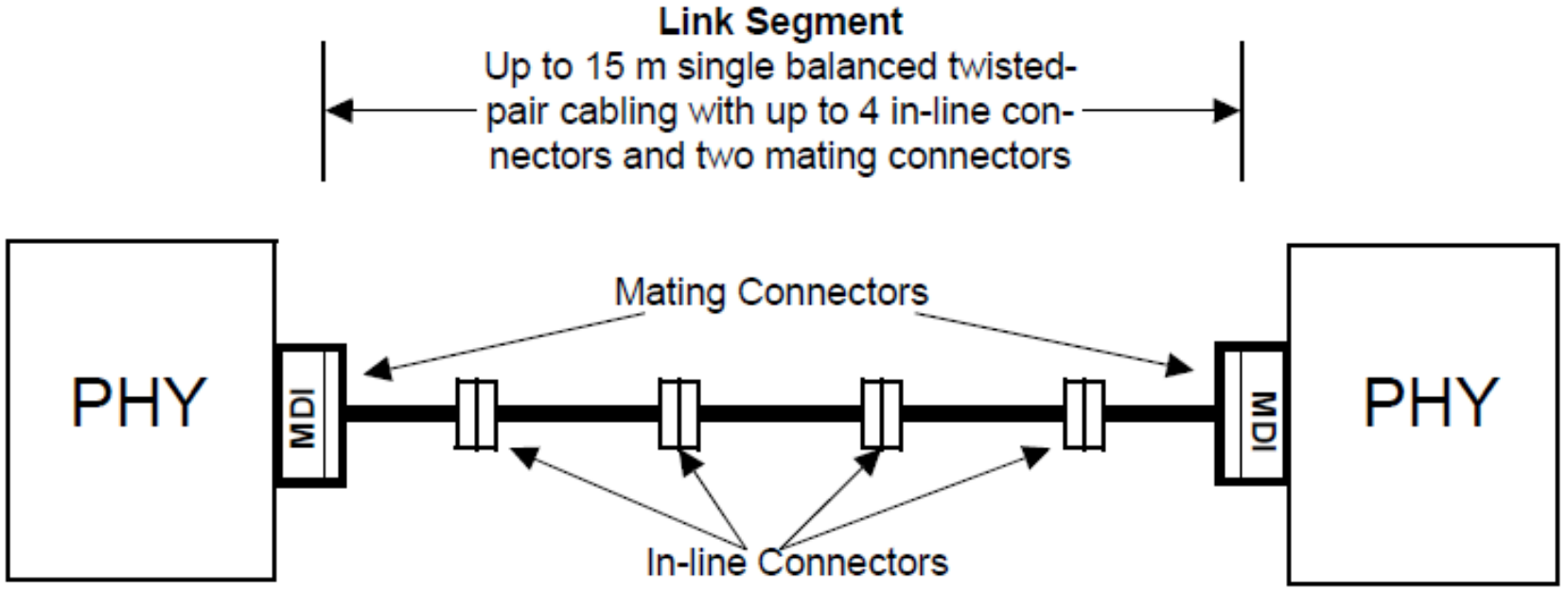
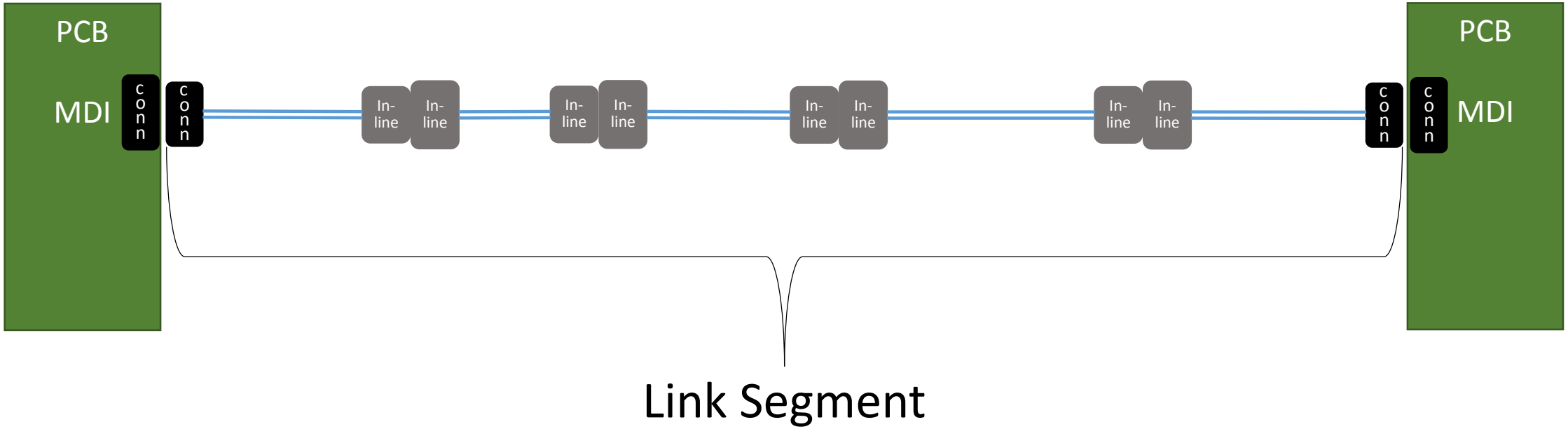


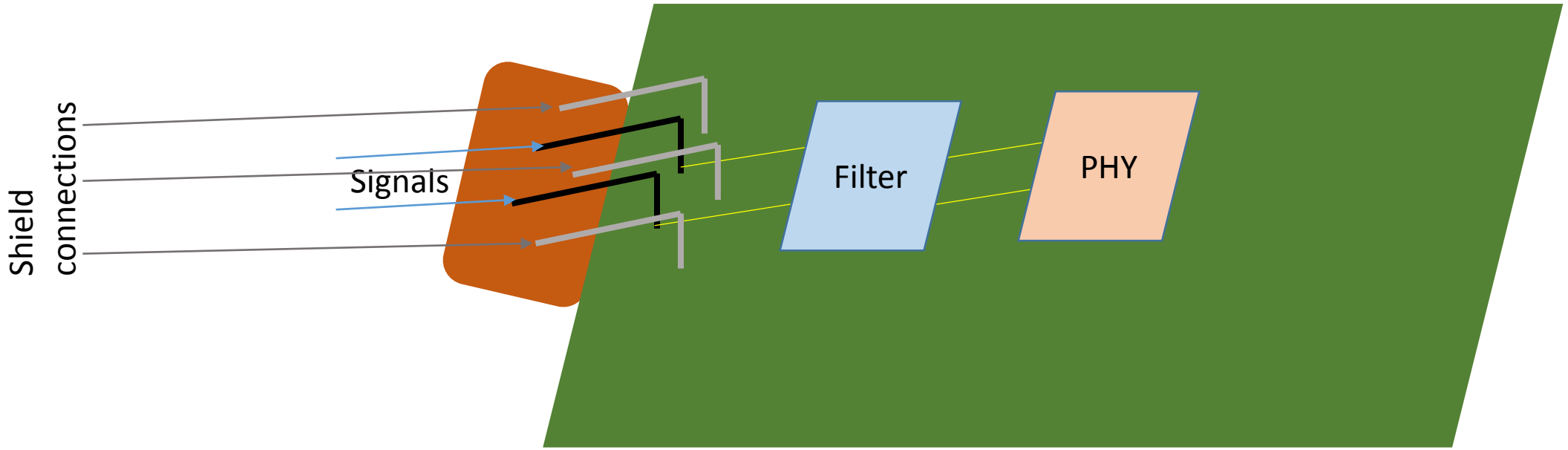
Figure 96–28—Link segment definition

NGAUTO Link Segment Definition

- Use 802.3bw definition which clearly shows the mating connectors are part of the link segment, not the MDI.



Header connection to PCB



MDI Requirements

- Traditionally, only Return Loss and Mode Conversion Loss are defined for the MDI.
- Is this sufficient for a shielded cable?
  - Shield is brought to PCB through pins or side pieces, not all around the signal pins
  - Do trace dimensions need to be considered?
  - Can the header connector be performance be measured on its own or does it need to be measured with the mating connector?