802.3ck Frequency Domain Limits for Mated Cables

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17 June 2020
Overview:

- **OBJECTIVE:** To propose frequency domain limits for mated cable TBDs in the 802.3ck D1.2 draft
  - Differential to common-mode return loss (Section 162.11.4)
  - Differential to common-mode conversion loss (Section 162.11.5)
  - Common-mode to common-mode return loss (Section 162.11.6)
- The data on the following slides is measured 2m 25awg proof of concept (POC; see next slide) QSFP-DD cable
Proof of Concept Connectors and Cables:

- Proof of concept connectors are partially populated
  - Only the two shortest rows of contacts are available
- Cables were pinned out to accommodate these connectors:

**Cable Pinout:**

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
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</thead>
<tbody>
<tr>
<td>Tx2</td>
<td>Rx5</td>
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<tr>
<td>Tx4</td>
<td>Rx7</td>
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<tr>
<td>Tx6</td>
<td>Rx1</td>
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<tr>
<td>Tx8</td>
<td>Rx3</td>
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<tr>
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<td></td>
</tr>
</tbody>
</table>
Differential to Common-Mode Return Loss:

802.3ck proposal:

\[
\begin{align*}
\left(22 - \frac{15}{26.56} f\right) dB & \quad 0.05 \text{ GHz} \leq f < 17.7 \text{ GHz} \\
\left(16 - \frac{6}{26.56} f\right) dB & \quad 17.7 \text{ GHz} \leq f \leq 40 \text{ GHz}
\end{align*}
\]
Differential to Common-Mode Conversion Loss:

This limit to be revisited at a later date
Common-Mode to Common-Mode Return Loss:

**802.3ck proposal:** 2 dB  \(0.05 \text{GHz} \leq f < 40 \text{GHz}\)

**Key:**
- **BLUE** = POC Data
- **BLACK** = 802.3cd
- **RED** = 802.3ck proposal
Proposal Summary:

- Differential to common-mode return loss (Section 162.11.4)
  \[
  \begin{align*}
  &\left(22 - \frac{15}{26.56} f\right) dB & 0.05 \text{ GHz} \leq f < 17.7 \text{ GHz} \\
  &\left(16 - \frac{6}{26.56} f\right) dB & 17.7 \text{ GHz} \leq f \leq 40 \text{ GHz}
  \end{align*}
  \]

- Differential to common-mode conversion loss (Section 162.11.5)
  - This limit to be revisited at a later date

- Common-mode to common-mode return loss (Section 162.11.6)
  \[
  2 \text{ dB} \quad 0.05 \text{ GHz} \leq f < 40 \text{ GHz}
  \]