Change of impedance for P802.3dj

Richard Mellitz, Samtec
Adam Gregory, Samtec

Generalize s parameter impedance transformation*

- Given:
  - S is the original s parameter matrix
    - With Z_0 as the original diagonal impedance matrix where each diagonal entry is the impedance of that port
  - S' is the new s parameter matrix
    - With Z_1 as the new diagonal impedance matrix where each diagonal entry is the impedance of that port
- $\boldsymbol{S' = A^{-1}(I - S\rho)^{-1}(S - \rho)A}$
  - $\rho = \frac{Z_1 - Z_0}{Z_1 + Z_0}$
  - $A = \frac{Z_1 + Z_0}{\sqrt{Z_1 Z_0}}$
  - *I* is the identity matrix

* T. Reveyrand, "Multiport conversions between S, Z, Y, h, ABCD and T parameters," AWR Corporation Application Note, 2011.

Changes in D2.0

P 363 line 45
178.9.2.1.2 Test fixture effective return loss (ERL)
ERL impedance should be aligned to Rd and 179B.
Suggested Remedy
Add line:
The reference differential impedance for the test fixture ERL computation shall be 92.5 Ω.

P 403 line 23
179.9.4.7 Transmitter effective return loss (ERL)
ERL impedance should be aligned to Rd and 179B.
Suggested Remedy
Add line:
The reference differential impedance for ERL computation shall be 92.5 Ω.

P 413 line 11
179.11.3 Cable assembly ERL
ERL impedance should be aligned to Rd and 179B.
Suggested Remedy
Add line:
The reference differential impedance for ERL computation shall be 92.5 Ω.

P 726 line 38
176C.6.3.5 Transmitter difference effective return loss (ERL)
ERL impedance should be aligned to Rd and 179B.
Suggested Remedy
Add line:
The reference differential impedance for the test fixture ERL computation shall be 92.5 Ω.

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P 361 line 43
178.9.1 Reference impedance
The reference impedance for measurement should align with the test fixture reference.
Suggested Remedy
Change line to:
The reference impedance for differential specifications is 92.5 ohms . The reference impedance for common-mode specifications is 23.125 ohms .

P 393 line 40
179.9.3 Reference impedance
Change line to:
The reference impedance for differential specifications is 92.5 ohms . The reference impedance for common-mode specifications is 23.125 ohms .

P 412 line 47
179.11.1 Reference impedance
Change line to:
The reference impedance for differential specifications is 92.5 ohms . The reference impedance for common-mode specifications is 23.125 ohms .

P 723 line 18
176C.6.2 Reference impedance
Change line to:
The reference impedance for differential specifications is 92.5 ohms . The reference impedance for common-mode specifications is 23.125 ohms.

Changes in D2.0 (new section) and Av changes

P785 line 19
Annex 178A (normative) Specification methods for 200 Gb/s per lane electrical channel

Re-normalization of s-parameter is not defined in the document.

Reference impedance
Add new section 178A.2

The conversion of S s-parameter with reference Z_0 to S' s-parameter with reference Z_1 is computed as follows:

S'= A^(−1) *(I−S*rho)^(−1)* (S−rho)*A
where:
rho= $(Z\_1-Z\_0)/(Z\_1+Z\_0)$
A= $(Z\_1+Z\_0)/\mathrm{sqrt}(Z\_1*Z\_0)$
S is the original s-parameter matrix with Z_0 as the original diagonal impedance matrix where each diagonal entry is the impedance of that port.
S' is the new s-parameter matrix with Z_1 as the new diagonal impedance matrix where each diagonal entry is the impedance of that port

- P 372 line 7
  178.10 Channel characteristics
  P 416 line 27
  179.11.7.1 COM parameters
  P 733 line 10
  176C.7.1 Channel Operating Margin
  P 750 line 23
  176D.7.2 COM reference model

  Adjust COM voltage to 46.25 ohms measurement reference.
  Change

A_v	to 0.415
A_fe	to 0.415
A_ne	to 0.608

Thank You!