IEEE802.3 4P Task Force

Channel Pair To Pair Resistance Imbalance

(End to End System Imbalance)

Ad Hoc

Proposal for PSE PI P2PRUNB Model

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May 2014

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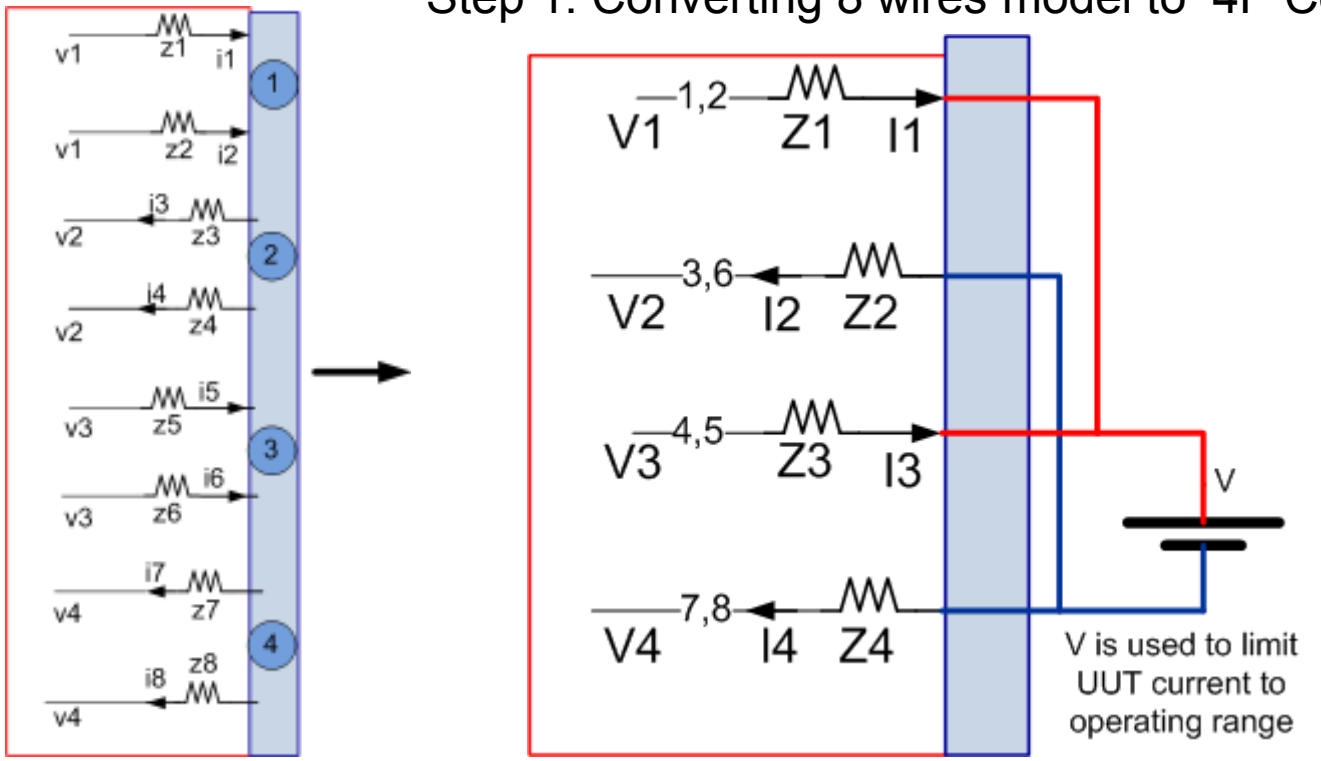
Proposal for PSE PI P2PRUNB model

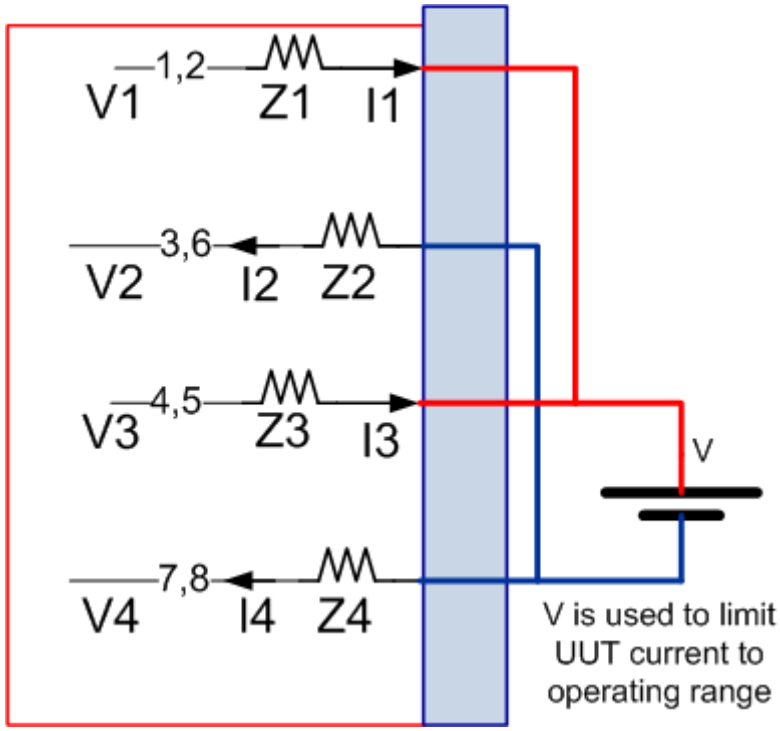
Step 1: Converting 8 wires model to 4P Common Mode Model



- Model is implementation independent
- Zi is the CM impedance of the implementation per pair. i=1to 4.
  - **We are interested in the DC value of that Impedance**.
- Vi is the voltage measured to the common point.
- Ii is PSE Icable current operating range per PSE type at ON_STATE.
- We want to specify P2P PSE PI Resistance Unbalance in terms of Vi and Ii.

Requirement Derivation - 1

- By definition:
- I1=(V1-V)/Z1 ➔ Z1=(V1-V)/I1
- I2=(V2-V)/Z2 ➔ Z2=(V2-V)/I2
- I3=(V3-V)/Z3 ➔ Z3=(V3-V)/I3
- I4=(V4-V)/Z4 ➔ Z4=(V4-V)/I4



- By definition:
- P2P PSE PI Zunbalance=

$$= \frac{Z_i - Z_j}{Z_i + Z_j} = \frac{\frac{V_i}{I_i} - \frac{V_j}{I_j}}{\frac{V_i}{I_i} + \frac{V_j}{I_j}} = TBD\max$$

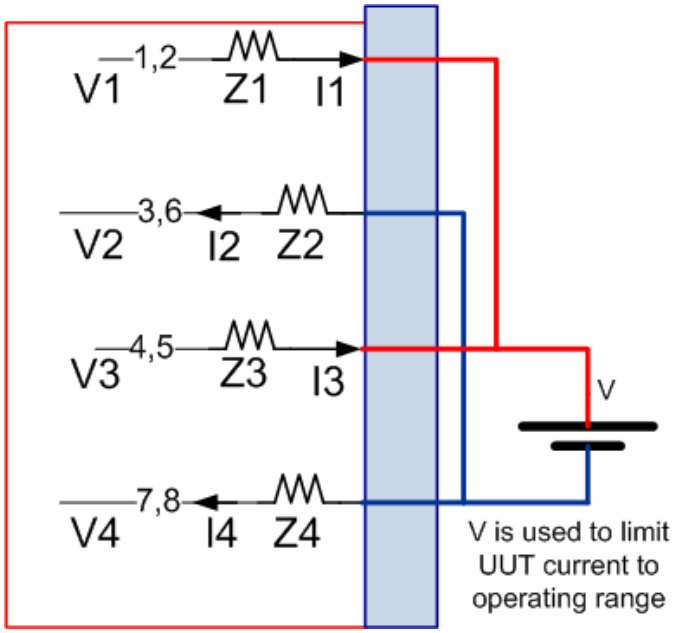
Between any two pairs i≠j .

Requirement Derivation - 2

- P2P PSE PI Zunbalance=

$$= \frac{Z_i - Z_j}{Z_i + Z_j} = \frac{\frac{V_i - V}{I_i} - \frac{V_j - V}{I_j}}{\frac{V_i - V}{I_i} + \frac{V_j - V}{I_j}} = TBD\max$$

Between any two pairs i≠j.
Since we need Z in DC ➔ Z➔R



(1) $\frac{Z_i - Z_j}{Z_i + Z_j} = \frac{R_i - R_j}{R_i + R_j} = P2PRUNB\max,$

Ri is function of Vi/Ii which addresses non linear circuitry at worst case unbalance operating point defined by PSE vendor.

(2) $\left|(V_1 - V_2)\right| - \left|(V_3 - V_4)\right| < (57V - 50V) = 7V(TBD)$

(3) $V_1 - V_2 = 44V \ \ to \ \ 57V\max$

(4) $V_3 - V_4 = 44V \ \ to \ \ 57V\max$

Comments?