

# Annex 93A Proposed Updates

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IEEE 802.3ck 100 Gb/s, 200 Gb/s and 400 Gb/s  
Electrical Interfaces Task Force

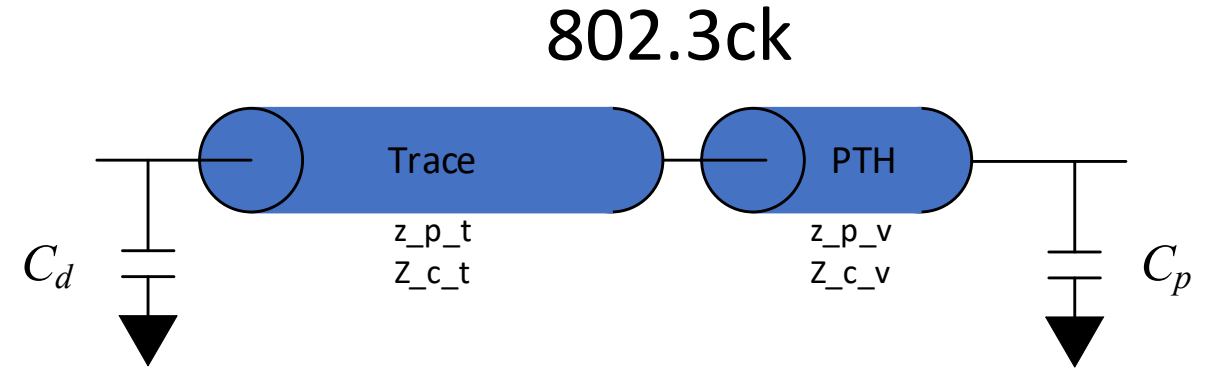
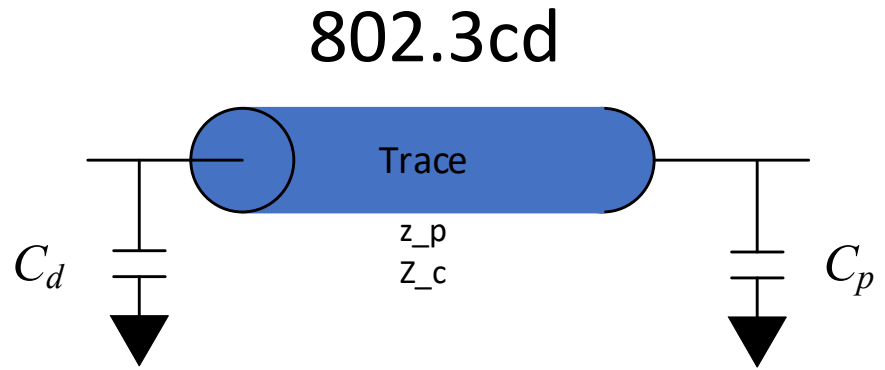
# Objective & Summary of Expected Changes

**Objective:** Propose updates to Annex 93A and get support and/or feedback.

## **Expected changes:**

- Flexible reference package model per [http://www.ieee802.org/3/ck/public/18\\_11/benartsi\\_3ck\\_01\\_1118.pdf](http://www.ieee802.org/3/ck/public/18_11/benartsi_3ck_01_1118.pdf).
  - Modify Table 93A-1 to include the parameters for the PTH transmission line (slide 3).
  - Modify 93A.1.2 include the transmission line section for the PTH (slide 4).
  - Open: May need verbiage to describe usage with the new model for .ck as well as existing models for .bs and .cd.
- Add a 3<sup>rd</sup> pre-cursor tap to the transmit equalizer in Table 93A-1.
- Modify Table 93A-2 to include references to the new clauses (162, 163).
- Reference receiver with a mix of fixed and floating DFE taps.
  - Refer to [http://www.ieee802.org/3/ck/public/19\\_05/mellitz\\_3ck\\_01\\_0519.pdf](http://www.ieee802.org/3/ck/public/19_05/mellitz_3ck_01_0519.pdf).

# Reference Package: 93A.1.2.4



## Existing text:

### 93A.1.2.4 Assembly of transmitter and receiver device package models

The scattering parameters for the transmitter device package model  $S^{(tp)}$  are the result of the cascade connection of the device capacitance, package transmission line, and board capacitance as defined by Equation (93A-15).

$$S^{(tp)} = \text{cascade}(\text{cascade}(S^{(d)}, S^{(l)}), S^{(p)}) \quad (93A-15)$$

Similarly, the scattering parameters for the receiver device package model  $S^{(rp)}$  are the result of the cascade connection of the board capacitance, package transmission line, and device capacitance as defined by Equation (93A-16).

$$S^{(rp)} = \text{cascade}(\text{cascade}(S^{(p)}, S^{(l)}), S^{(d)}) \quad (93A-16)$$

## Revised text:

### 93A.1.2.4 Assembly of transmitter and receiver device package models

The scattering parameters for the transmitter device package model  $S^{(tp)}$  are the result of the cascade connection of the device capacitance, package transmission lines, and board capacitance as defined by Equation (93A-15).

$$S^{(tp)} = \text{cascade}(\text{cascade}(\text{cascade}(S^{(d)}, S^{(l)}), \mathbf{S}^{(v)}), S^{(p)}) \quad (93A-15)$$

Similarly, the scattering parameters for the receiver device package model  $S^{(rp)}$  are the result of the cascade connection of the board capacitance, package transmission line, device capacitance, package transmission line, and device capacitance as defined by Equation (93A-16)

$$S^{(rp)} = \text{cascade}(\text{cascade}(\text{cascade}(S^{(p)}, \mathbf{S}^{(v)}), S^{(l)}), S^{(d)}) \quad (93A-16)$$

# Reference Package: Table 93A-1

*Insert the following rows (and footnotes) into Table 93A-1 at the bottom of the “Device package model” row, and reletter the footnotes accordingly:*

**Table 93A-1—COM parameters**

<b>Parameter</b>	<b>Reference</b>	<b>Symbol</b>	<b>Units</b>
PTH transmission line length <sup>c</sup>		$Z_{p2}$	mm
PTH transmission line characteristic impedance <sup>d</sup>		$Z_{c2}$	W

<sup>c</sup>Some clauses that invoke this method do not provide a value for  $z_{p2}$ . See 93.A.1.2.

<sup>d</sup>Some clauses that invoke this method do not provide a value for  $Z_{c2}$ . See 93.A.1.2.

# Transmit Equalizer: Table 93A-1

*Insert the following rows (and footnotes) into Table 93A-1 after the “Transmitter equalizer, minimum cursor coefficient” row, and reletter the footnotes accordingly:*

**Table 93A-1—COM parameters**

<b>Parameter</b>	<b>Reference</b>	<b>Symbol</b>	<b>Units</b>
Transmitter equalizer, 3 <sup>rd</sup> pre-cursor coefficient <sup>a</sup>		c(-3)	
Minimum value			—
Maximum value			—
Step size			—

<sup>a</sup>Some clauses that invoke this method do not provide a value for c(-3). See 93.A.1.6.

# Table 93A-2

*Add the following of rows in Table 93A-2 below the “100GAUI-4 C2C (Annex 135D)” row:*

<b>Physical Layer</b>	<b>Parameter values</b>
...	...
100GBASE-CR1 (Clause 162)	Table 162-x
200GBASE-CR2 (Clause 162)	Table 162-x
400GBASE-CR4 (Clause 162)	Table 162-x
100GBASE-KR1 (Clause 163)	Table 163-x
200GBASE-KR2 (Clause 163)	Table 163-x
400GBASE-KR4 (Clause 163)	Table 163-x

Note: the ‘x’ will be replaced with the appropriate table numbers once the drafts for those clauses are available.

Thank you!