COM 100G Revision History, Latest Feedback/Update and Configuration Spreadsheet

Richard Mellitz, Samtec

November 2018 IEEE802.3 Plenary, Bangkok, Thailand

Table of Contents

COM 2.40

IEEE P802.3ck July 25, 2018 Ad Hoc Meeting

http://www.ieee802.org/3/ck/public/adhoc/july25_18/mellitz_3ck_adhoc_01a_072518.pdf

Available for analysis

1. Zero Forced DFE
2. Quantized Forced DFE - abandoned
   - only produced COM offset
3. One DFE tap and a number of (Rx)FFE taps
   - Sum of taps = 1
4. One DFE tap and a number of (Rx)FFE taps with gain at cursor - abandoned
   - Same as 4 but gain at cursor
   - Gain not justified

Changed computation of crosstalk variance in optimize_FOM()/get_xtlk_noise() to be computed similar to ICN in the frequency domain.

- ❑ 5x speed-up for 7 or more crosstalk aggressor
- ❑ Original get_xtlk_noise() renamed to get_xtlk_noise1()

COM 2.41

IEEE P802.3ck August 15, 2018 Ad Hoc Meeting

http://www.ieee802.org/3/ck/public/adhoc/aug15_18/mellitz_3ck_adhoc_01_081518.pdf

1. Zero Forced DFE
2. Quantized Forced DFE - abandoned
3. One DFE tap and a number of (Rx)FFE taps
   - Cursor tap set to 1
4. One DFE tap and a number of (Rx)FFE taps with gain at cursor - abandoned

COM 2.50

- Flexible Package Model added
  - http://www.ieee802.org/3/ck/public/18_09/mellitz_3ck_01_0918.pdf

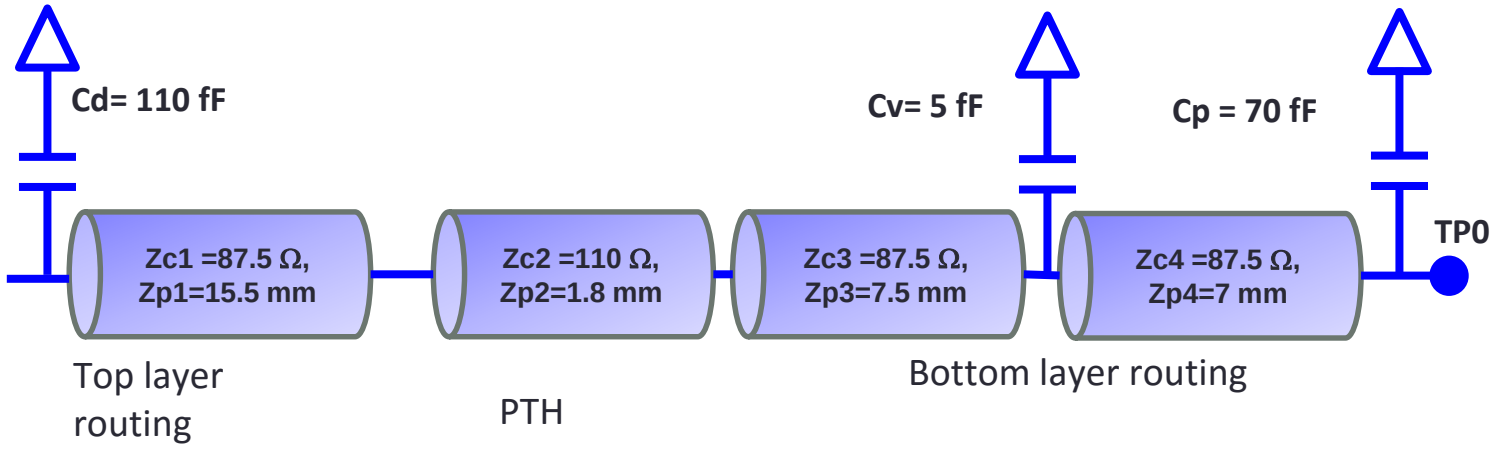


Table 93A–3 parameters		
Parameter	**Setting**	**Units**
package_tl_gamma0_a1_a2	[0 1.0404e-3 4.201e-4]	
package_tl_tau	6.325E-03	ns/mm
package_Z_c	[87.5 87.5 ; 110 110; 87.5 87.5; 87.5 87.5]	Ohm (Tx Rx)

C_d	[1.1e-4 1.1e-4]
z_p select	1
z_p (TX)	[15.5 20 30; 1.8 0 0; 7.5 0 0; 7 0 0]
z_p (NEXT)	[15.5 20 30; 1.8 0 0; 7.5 0 0; 7 0 0]
z_p (FEXT)	[15.5 20 30; 1.8 0 0; 7.5 0 0; 7 0 0]
z_p (RX)	[15.5 20 30; 1.8 0 0; 7.5 0 0; 7 0 0]
C_p	[0.7e-4 0.7e-4]
C_v	[5e-6 5e-6]

COM 2.51

IEEE P802.3ck OCT 03, 2018 Ad Hoc Meeting

http://www.ieee802.org/3/ck/public/adhoc/oct03_18/mellitz_3ck_adhoc_01_100318.pdf

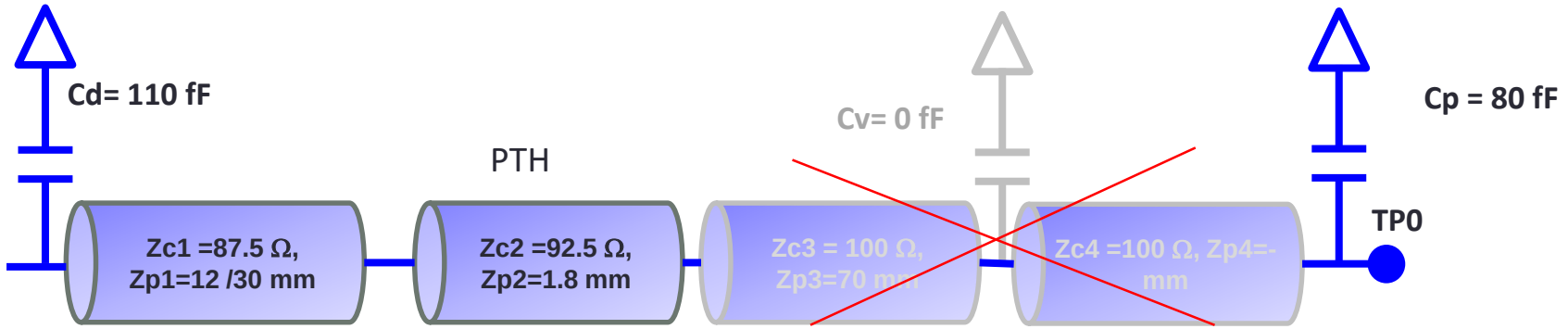
- ❑ Rx FFE monotonic tap sensitivity refinement per wu_3ck_01_0918 in the IEEE P802.3ck July interim meeting

  http://www.ieee802.org/3/ck/public/18_09/wu_3ck_01_0918.pdf

- ❑ Fixed RxFFE index modulus problem in force()
  - John Ewen, Global Foundries
- ❑ Refined RxFFE post cursor forcing to the minimum of the post cursor pulse response value or the DFE1 b_{max} limit.
- ❑ Removed minimum signal threshold for TDR and ERL computations

COM 2.52 12 mm & 30 mm package

- Flexible Package Model initial 12 mm / 30 mm suggestion
- From Liav Ben-Artsi, Marvell Israel Ltd



Parameter	Setting	Units
package_tl_gamma0_a1_a2	[0 0.0007901838 0.00050925]	
package_tl_tau	6.325E-03	ns/mm
package_Z_c	[87.5 87.5 ; 92.5 92.5; 100 100 ; 100 100]	Ohm

C_d	[1.1e-4 1.1e-4]
z_p select	[1 2]
z_p (TX)	[12 30; 1.8 1.8 ; 0 0 ; 0 0]
z_p (NEXT)	[12 30; 1.8 1.8 ; 0 0 ; 0 0]
z_p (FEXT)	[12 30; 1.8 1.8 ; 0 0 ; 0 0]
z_p (RX)	[12 30; 1.8 1.8 ; 0 0 ; 0 0]
C_p	[0.8e-4 0.8e-4]
C_v	[0 0]

COM 2.52 (test version only)

- add Rx FFE filter to receiver noise filter to eq. 93A-35 per request from Bill Kirkland, Semtech
  - This basically adds Rx noise amplification from the Rx FFE

$$\sigma_N^2 = \eta_0 \int_0^\infty |H_r(f) H_{ctf}(f)|^2 df$$

$H_{RxFFE}(f)$

- change ICN in get_xtlk_noise() to end at fb rather than fb/2. No impact observed because only used to compute the FOM to determine equalizer settings
- 12 mm and 30 mm package proposal spreadsheets

COM 2.53 just bug fixes

- Equivalent to 2.52 with a minor bug fix
- Keep some channels from crashing COM
  - Indexing fix in force routine
  - Upen Kareti
- Remove bug when not FFE post cursors are present but FFE precursors are requested
  - Yasuo Hidaka

Thank You!