200G-PSM4: Potential Specifications

Brian Welch (Luxtera)

Tom Palkert (Luxtera)

Supporters

- Rob Stone (Broadcom)
- Eric Baden (Broadcom)
- Kohichi Tamura (Oclaro)
- Doug Coleman (Corning)
- Steve Swanson (Corning)
- Hai-Feng Liu (Intel)
- Mike Hughes (USConec)
- Tom Mitcheltree (USConec)

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- **The intent of this presentation is** to demonstrate how a 200G solution over a PSM4 fiber plant could be specified.

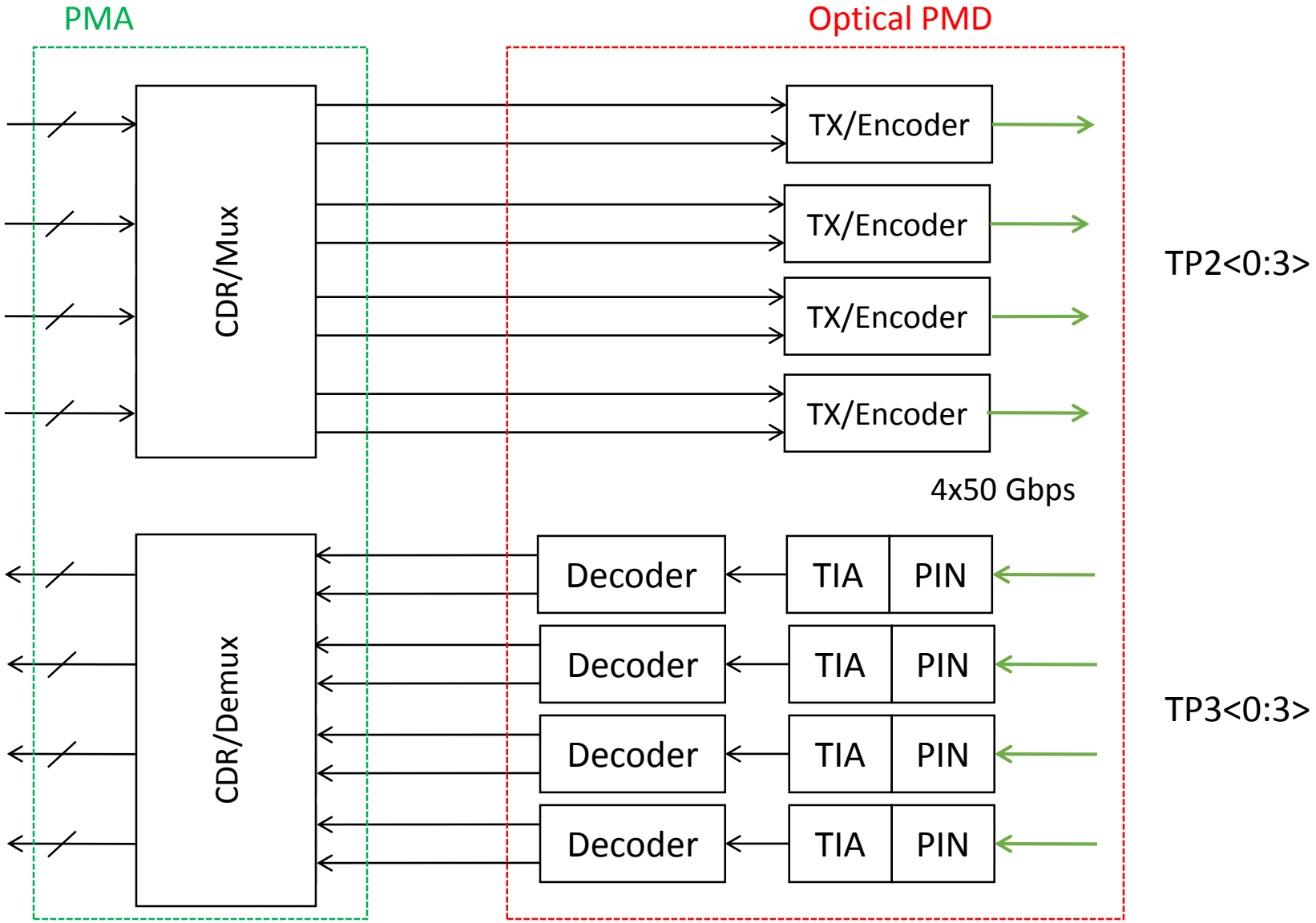
- **This presentation is** in response to confusion at the last 802.3 meeting as to what proposal one might expect were there to be a 200G Ethernet 500m SMF reach objective adopted.

- **This presentation is not** a baseline proposal, but is the authors current view of what might be proposed if a 200GE SMF 500m reach objective is adopted.

200G-PSM4

- Configuration: A 4x50 Gb/s parallel SMF interconnect.
  - PSM4 = Four fibers per direction
- Reach >= 500m
- Lane Speed: 50 Gb/s per lane using 25 GBaud-PAM4 optical signaling
- Uncorrected BER < 2e-4
- Single wavelength solution

200G-PSM4 Block Diagram

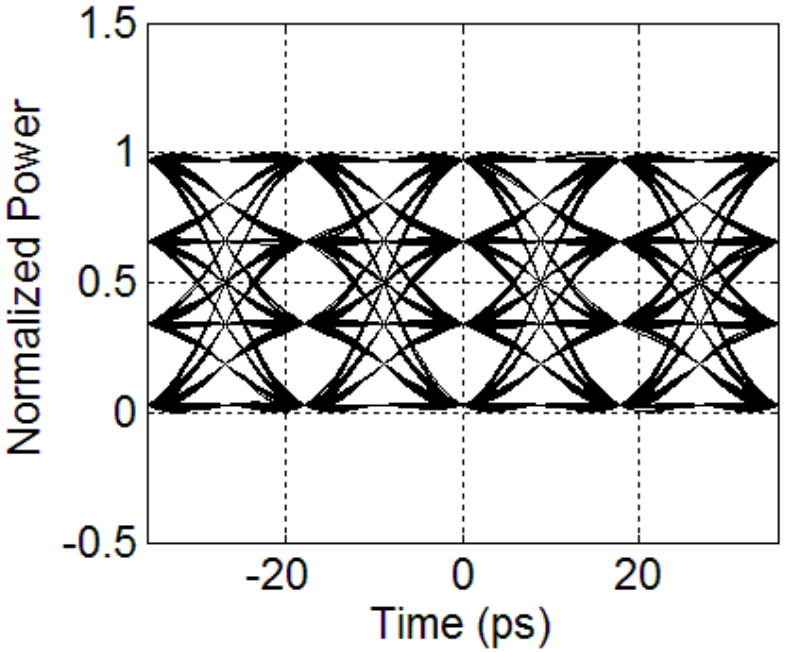


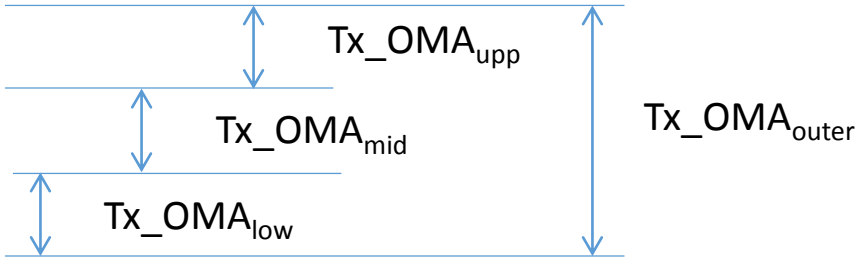
200G-PSM4 : Link Parameters

	200G-PSM4
Reach, min (m)	500
Signaling rate, each lane (Range)	26.5625 ± 100 ppm GBd
Encoding type	PAM4
Wavelength(s)	1303.5 to 1316.5 nm
Uncorrected BER	< 2.0e-4
Channel insertion loss, max (dB)†	3
Allocation for penalties, at max TDP (dB)‡	2.5
MPI Penalty	TBD
Power margin, at min TDP (dB)	9.1
Maximum discrete reflectance (dB)	TBD

† From http://www.ieee802.org/3/bs/public/14_05/kolesar_3bs_01_0514.pdf
All Parameters Subject to Change

Transmitter Specifications





- Max OMA and ER specified based on outer Tx_OMA$_{outer}$
- Sensitivity and link budget based on inner Tx_OMA$_{low/mid/upp}$
  - Spec applies to minimum of 3 inner eye transitions

200G-PSM4: Transmitter Specifications (TP2)

	200G-PSM4
Signaling rate, each lane (Range)	26.5625 ± 100 ppm GBd
Encoding type	PAM4
Wavelength(s)	1303.5 to 1316.5 nm
OMA_{outer}, each lane, max (dBm)	2.8
OMA_{outer}, each lane, min (dBm)	-2.5
$OMA_{low/mid/upp}$, each lane, min (dBm)	-7.3
ER_{outer}, each lane, min (dB)	4.5
Average launch power, each lane max (dBm)	3
Average launch power, each lane min (dBm)	-4.6
TDP, each lane, max (dB)	2.5
Transmitter RIN_{ave}, max (dB/Hz)	-142
Transmitter reflectance, max (dB)	TBD
Transmitter Eye Mask	TBD

All Parameters Subject to Change

200G-PSM4: Receiver Specifications (TP3)

	200G-PSM4
Signaling rate, each lane (Range)	26.5625 ± 100 ppm GBd
Encoding type	PAM4
Wavelength(s)	1303.5 to 1316.5 nm
Receiver sensitivity (OMA), each lane max (dBm)†	-11.6
Average receive power, each lane max (dBm)	3.0
Average receive power, each lane min (dBm)	-7.6
Damage threshold (dBm)	6.5
Receiver reflectance, max (dB)	-26
Stressed receiver sensitivity (OMA), each lane max (dBm)	TBD
Conditions of stressed receiver sensitivity test:	
Vertical eye closure penalty, each lane (dB)	TBD
Stressed eye J2 Jitter, each lane (UI)	TBD
Stressed eye J4 Jitter, each lane (UI)	TBD
Stressed eye mask definition	TBD

† Received sensitivity reported in 'NRZ mode' and uncorrected BER, equivalent to sensitivity for any sub-eye low/mid/upp
All Parameters Subject to Change

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Thank You