

# 8x50G NRZ Baseline Update

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- Purpose of this presentation is:
  - Provide summary of NRZ contributions
  - Update baseline proposal “kojima\_3bs\_01a\_0115”.

- 8 x 53.2 Gb/s NRZ is the most robust modulation formats
  - ◆ Experimental data from multiple companies show enough margins

	B-to-B Sens. (OMA)	Allocation for DEMUX	EQ	CDR
This proposal (10 km)	-8.8dBm	-	-	-
cole_3bs_02_0315	-13.0dBm	4.2dB	Yes	No
wen_3bs_01_0315	-12.3dBm	3.5dB	Yes	No
shirao_3bs_01a_0315	-13.1dBm	4.3dB	No	No
takai_3bs_01_0515	-13.0dBm	4.2dB	No	No
takai_3bs_01_0515	-14.7dBm	5.9dB	Yes	Yes

- ◆ Error-free operation ( $<1E-12$ ) was confirmed for NRZ because of 9dB better SNDR tolerance than PAM4.
- ◆ Possibility for extra margins of 1.0dB with low noise TIA( $\sim 15pA/\sqrt{Hz}$ )
  - takai\_3bs\_01\_0515
- ◆ Possibility for extra margins as component bandwidth increases with time
  - cole\_3bs\_02\_0315
- ◆ Multiple transmitter options
  - EML, DML, Silicon Photonics

- Channel insertion loss is aligned to other proposals:

2 km :4.0dB

[http://www.ieee802.org/3/bs/public/15\\_03/lewis\\_3bs\\_01\\_0315.pdf](http://www.ieee802.org/3/bs/public/15_03/lewis_3bs_01_0315.pdf)

10km: 6.3dB

[http://www.ieee802.org/3/bs/public/15\\_03/stassar\\_3bs\\_01a\\_0315.pdf](http://www.ieee802.org/3/bs/public/15_03/stassar_3bs_01a_0315.pdf)

-Updated

Description	2km	10km	Unit
Power budget (for max TDP)	5.8	8.8	dB
Operation distance	2.0	10.0	km
Channel insertion loss	4.0	6.3	dB
Maximum Discrete Reflectance	-26	-26	dB
Allocation for penalties (for max TDP)	1.8	2.5	dB

-Updated

Description	2km	10km	Unit
Signaling rate, each lane	53.125+/-100ppm	53.125+/-100ppm	Gb/s
Operation BER	2E-4	2E-4	
Total average launch power (max)	13.2	13.2	dBm
OMA, each lane (max)	4.0	4.0	dBm
OMA, each lane (min)	-2.5	-1.5	dBm
Launch Power in OMA minus TDP, each lane (min)	-3.5	-2.5	dBm
Transmitter and dispersion penalty (TDP), each lane (max)	1.8	2.5	dB
Extinction ratio (dB)	4.5	4.5	dB
RIN OMA (max)	-130	-130	dB/√Hz
Optical return loss tolerance (max)	20	20	dB
Transmitter 3dB frequency (min)	TBD	TBD	GHz

-Updated

Description	2km	10km	Unit
Signaling rate, each lane	53.125+/-100ppm	53.125+/-100ppm	Gb/s
Operation BER	2E-4	2E-4	
Receiver reflectance (max)	-26	-26	dB
Receiver sensitivity (OMA), each lane (max)	-7.5	-8.8	dBm
Receiver 3dB electrical upper cutoff frequency, each lane (max)	42	42	GHz



-Same as “[kojima\\_3bs\\_01a\\_0115](#)”

Lane	Center Frequency (THz)	Center Wavelength (nm)	Wavelength Range (nm)
L <sub>0</sub>	235.4	1273.55	1272.55 to 1274.54
L <sub>1</sub>	234.6	1277.89	1276.89 to 1278.89
L <sub>2</sub>	233.8	1282.26	1281.25 to 1283.28
L <sub>3</sub>	233.0	1286.66	1285.65 to 1287.69
L <sub>4</sub>	231.4	1295.56	1294.51 to 1296.61
L <sub>5</sub>	230.6	1300.05	1299.00 to 1301.10
L <sub>6</sub>	229.8	1304.58	1303.53 to 1305.63
L <sub>7</sub>	229.0	1309.14	1308.09 to 1310.19