

Half-Retimed Pluggable Optics Status

Market Focus: Modules/Subsystems

ECOC 2024

23 September 2024

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Retimed Transmit Linear Receive (RTLRL) Optics

- LPO (Linear Pluggable Optics) is Linear Tx Linear Rx
- It has generated a lot of industry interest
 - OIF CEI-112, 224-Linear Linear Projects, LPO MSA
 - Potential for cost, power, latency savings by eliminating Tx and Rx DSP
- Drawback of LPO is two concatenated Cu links
- Advantage of RTLRL is Cu link isolation by DSP
- Other names: Half-retimed, Analog Receive Optics (ARO), Linear Receive Optics (LRO; from LPO MSA), HALO (Half Linear Optics)
- LPO and RTLRL address different applications
 - If LPO works, there is no need for RTLRL
 - If LPO does not work, then RTLRL is a candidate

Adopted OIF RTLR Spec. Objectives

- Full IEEE 802.3 electrical and optical plug-and-play
- 100G/lane spec: OIF EEI-112G-RTLR
 - 500m SMF DRn
 - 2km SMF FR4
 - 30m MMF SRn link
- 200G/lane spec: OIF EEI-224G-RTLR
 - 500m SMF DRn
 - 500m SMF FR4
- Basic Approach
 - Specify Linear Rx measurement
 - Leverage OIF CEI-112G-Linear methodology

OIF RTL Project Timeline

- Start
 - Discussion in 2023
 - Extensive industry support including major End Users
 - Unanimously approved Project at the OIF Q1 meeting (Jan'24)
- 100G/lane 1st Spec
 - Proposed Jun'24
 - Baseline adoption target: Q4'24 meeting (Nov'24)
 - Ballot process: Q1'25
- 200G/lane 1st Spec
 - Baseline adoption target: Q2'25 meeting (May'24)
- Those only interested in 200G/lane spec. should carefully review the 100G/lane spec because the same approach will be followed

Applications Comparison

	100G/lane			200G/lane			Unit
	IEEE 802.3 Fully retimed	OIF RTLRL Half retimed	LPO MSA Linear	IEEE 802.3 Fully retimed	OIF RTLRL Half retimed	LPO MSA Linear	
C2M Loss (max)	16	16	16	32	~27	~18	dB
Power	100	70	70 - 50	100	70	70 - 33	%
IEEE 802.3 TP2, TP3 Optical Interop	Yes	Yes	No	Yes	Yes	No	

LPO Reported Power Measurement Differences

- Dramatic power savings; 50 to 67% have been reported for LPO
- This differs significantly from power savings reported by others
- New technical results should be reported same as every ECOC technical paper
 - Assumptions
 - Measurements set up
 - Full measurement data set
 - Data analysis
 - Reproducibility
 - Conclusions
- The burden of proof is on those reporting dramatic result
- We are trying to organize engineers at companies working in the area to agree on objective measurement criteria to support consistent, reproducible results

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Thank you