

NRZ vs PAM-4 Re-Timer Power Comparison for 56Gb/s C2M and C2EO Electrical Channels

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Agenda

- C2M Re-Timer Power Estimates
- C2EO Re-Timer Power Estimates
- Summary

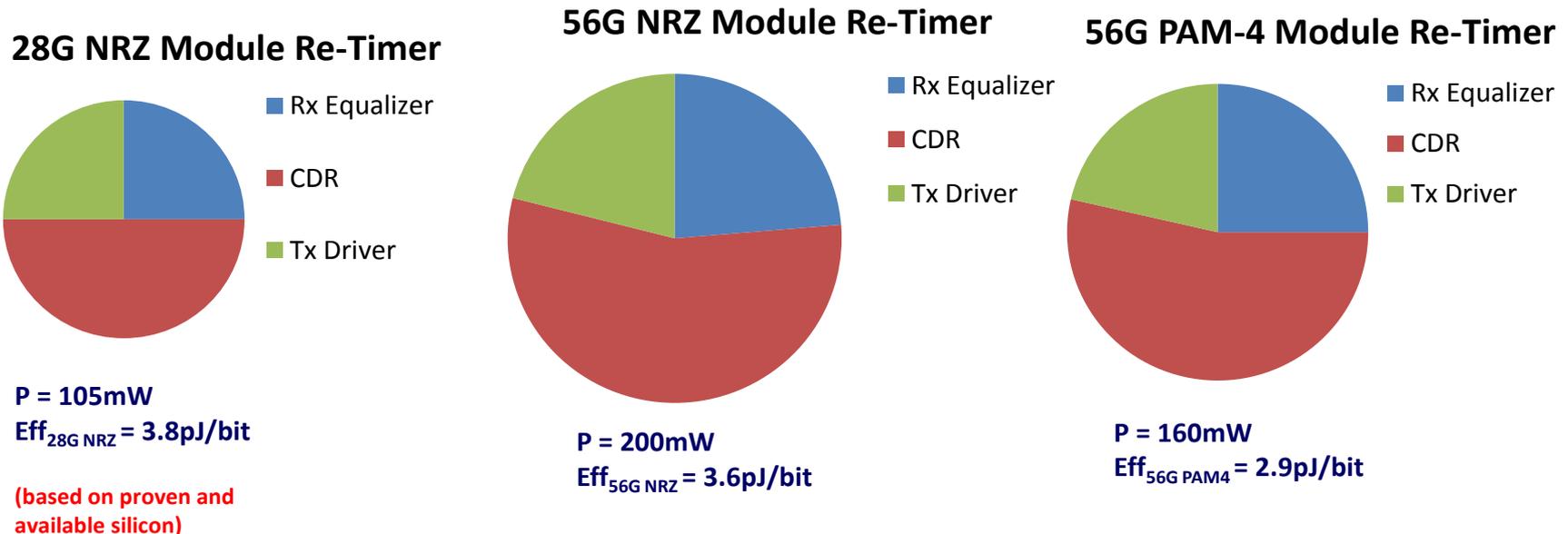
Re-Timer Assumptions

- PAM-4 C2M and C2EO receivers are based on an individual per lane reference-less CDR
 - compatible with reference-less and clock-forwarded interfaces

- NRZ C2M and C2EO receivers also based on a per lane reference-less CDR

C2M Module Transceiver Power Comparison

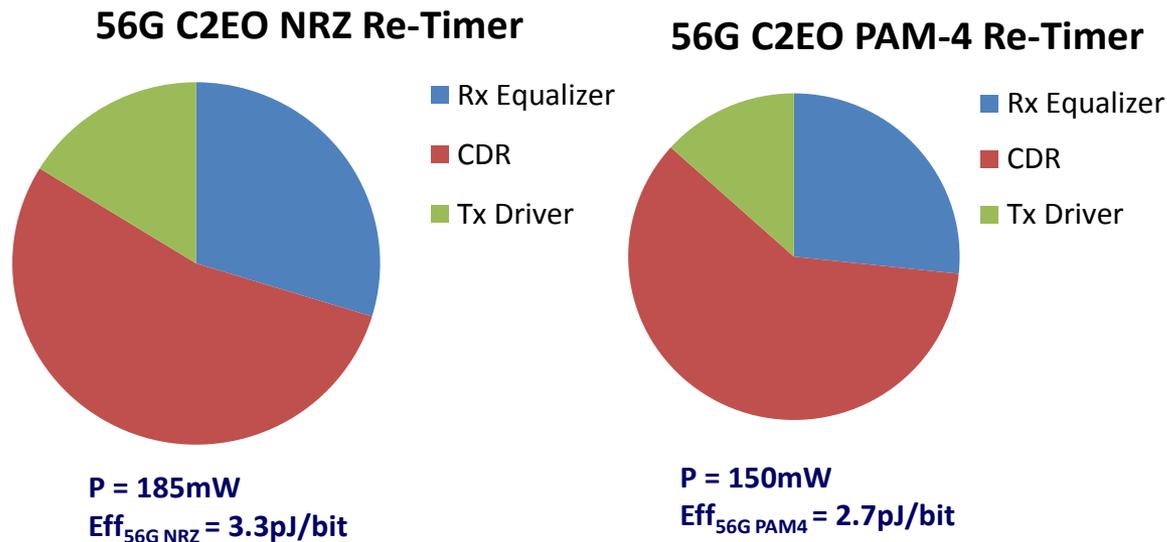
- **NRZ vs PAM-4 module re-timer power**
 - **for same modulation format at input and output**



- **56G PAM-4 C2M re-timer power is 80% that of NRZ**

C2EO Re-Timer Power Comparison

- **NRZ vs PAM-4 module re-timer power**
 - **for same modulation format at input and output**



- **56G PAM-4 C2EO re-timer power is 81% that of NRZ**

Summary

Interface	NRZ efficiency	PAM-4 efficiency
56Gb/s C2EO	3.3 pJ/bit	2.7 pJ/bit
56Gb/s C2M	3.6 pJ/bit	2.9 pJ/bit

- **PAM-4 re-timers will enable low power C2M and C2EO solutions**