

# Power and Complexity of 100G-SR4 Implementations

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# Implication of the Retimed Interface

- 100G-SR4 link performance is dominated by the VCSEL response with about 4 dBo of penalty if no equalizer is used
- The next largest source of penalty is the FR4 PCB trace in case of unretimed interface with about 1.5 dBo of penalty
- Operating the link from B2B to 100 m only adds just ~ 1dBo of penalty
- A retimed interface with FEC will be able to support 50-70 m reach but the this implementation will be:
  - High cost
  - High power
  - Larger
  - Higher latency
- The key advantages of retimed interface are the simplified interface and low risk interface.

# Overview of Penalties

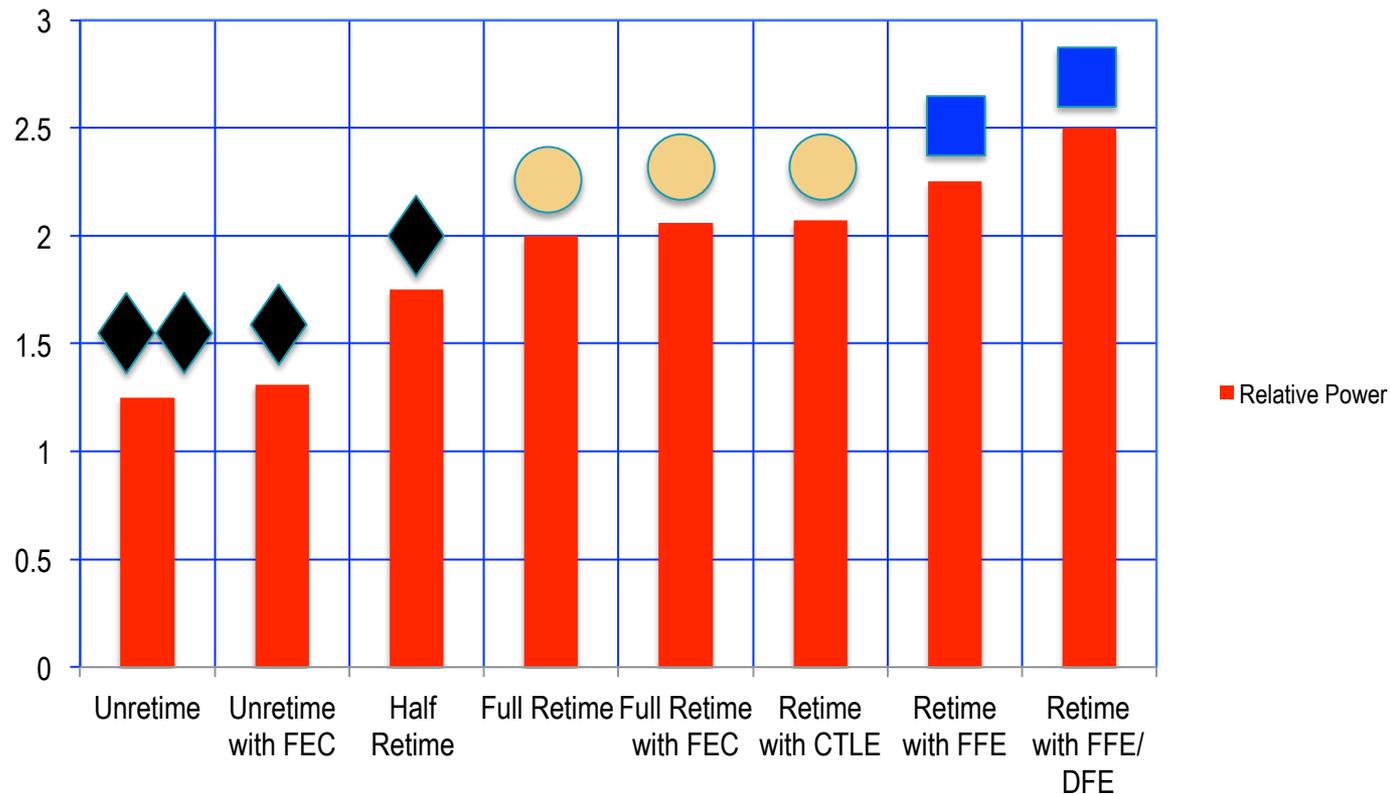
- Green mean feasible assuming maximum WDP penalty of 5 dBo
- Red mean non feasible but could become feasible with FEC

Impairment Source	No EQ	FFE=4, DFE=0	FFE=6, DFE=0	FFE=6, DFE=3
10G-SR link B2B	2.6 dBo	1.2 dBo	1.1 dBo	1.05 dBo
25G link B2B BW=0.62*B	4.1 dBo	2.9 dBo	2.5 dBo	2.4 dBo
25G 100m OM3 BW=0.62*B	5.2 dBo	3.8 dBo	3.4 dBo	3.0 dBo
25G 100m OM3 BW=0.5*B	5.9 dBo	4.2 dBo	3.7 dBo	3.3 dBo
25G 100m OM3 BW=0.62*B At TP5	9.3 dBo	6.1 dBo	5.3 dBo	4.7 dBo

# Solution Power Consumption

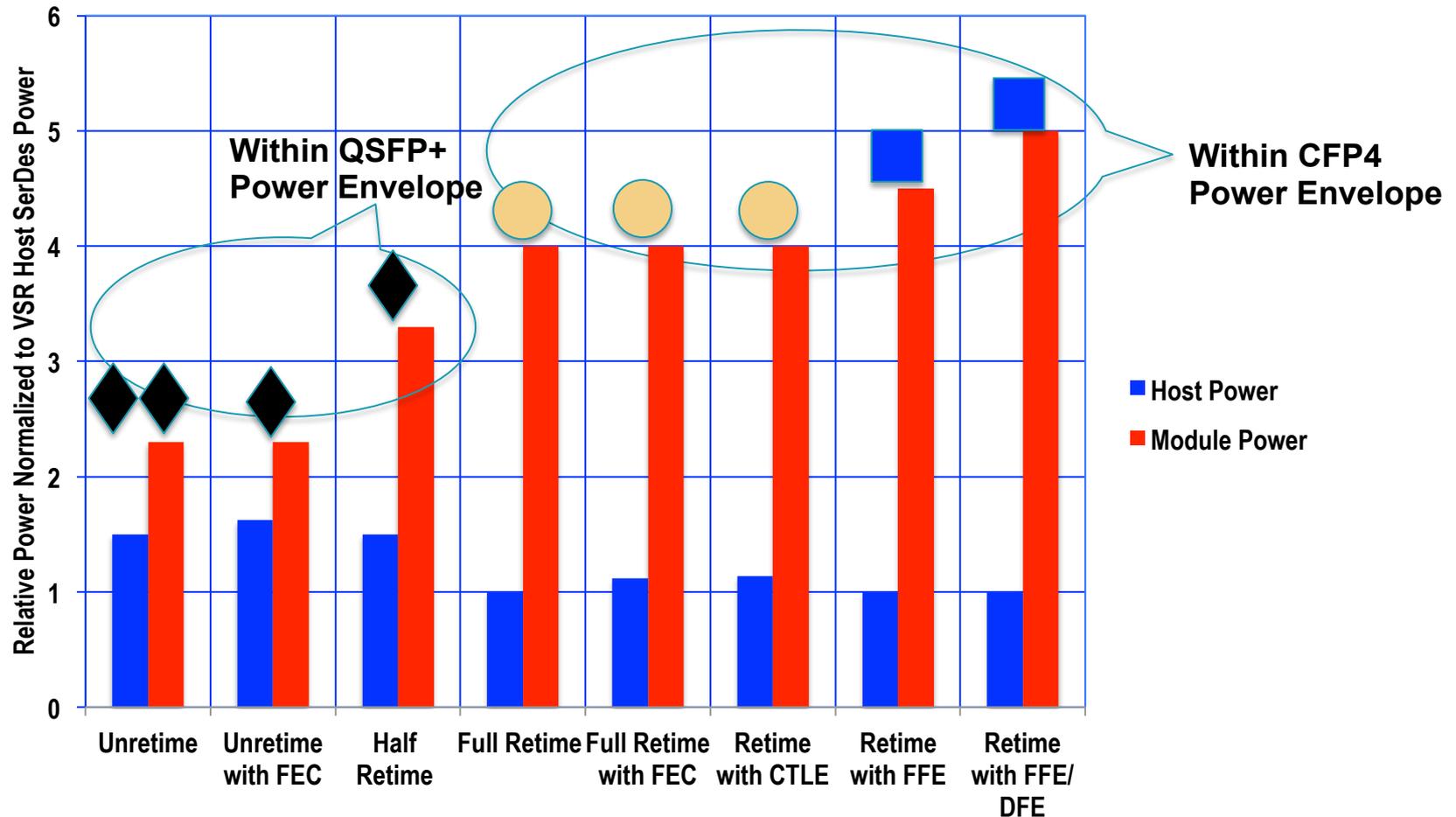
- Relative power include any host EQ power premium
- Alpine ski trail marking is used to show complexity of each solution

Relative Power of the Optics and the Interface



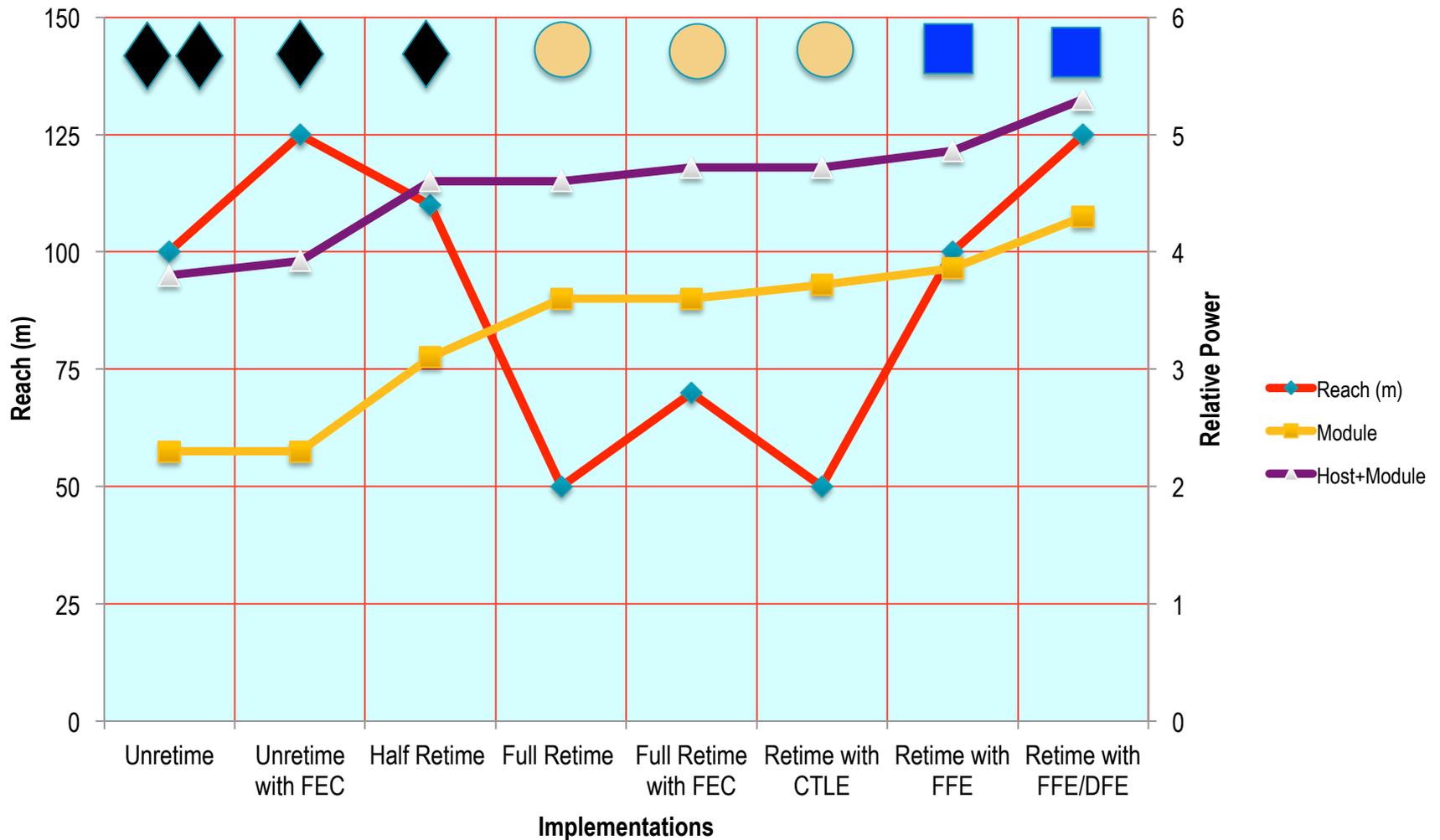
# Power Comparisons

- Relative power include any host EQ power premium



# Reach and Host/Module Implementations

- Fiber Reach assumes OM3



# Benefit of 25G Equalized SR Link

- Solves VCSEL slow fall time
- Solves VCSEL spectral width
- Solves photo detector capacitance
- Can support full 100 m on OM3 or 150 on OM4
- Link can operate to full 100 m without FEC addressing latency sensitive applications as well
- The unretimed link will have the lowest power
- As SFP+ has shown the unretimed link at 25G will also offer the lowest cost, power, and size
- Do not see any significant power or cost saving between 30 m vs 70 m retimed solution
- The unretime/half retime are more complex to define and require more focus effort, even if we don't define it in 100GNGOPTX we should take advantage of EQ to facilitate VCSEL/PD impairments and support full 100 m on OM3 or 150 m on OM4.