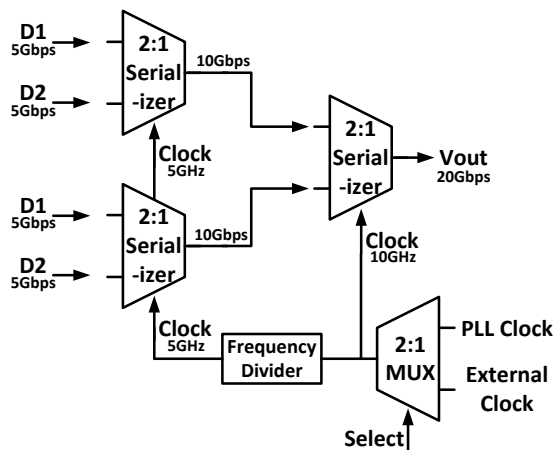


# 4:1 Serializer – 20-Gb/s Optical Transmitter

- 2:1 MUX tree structure

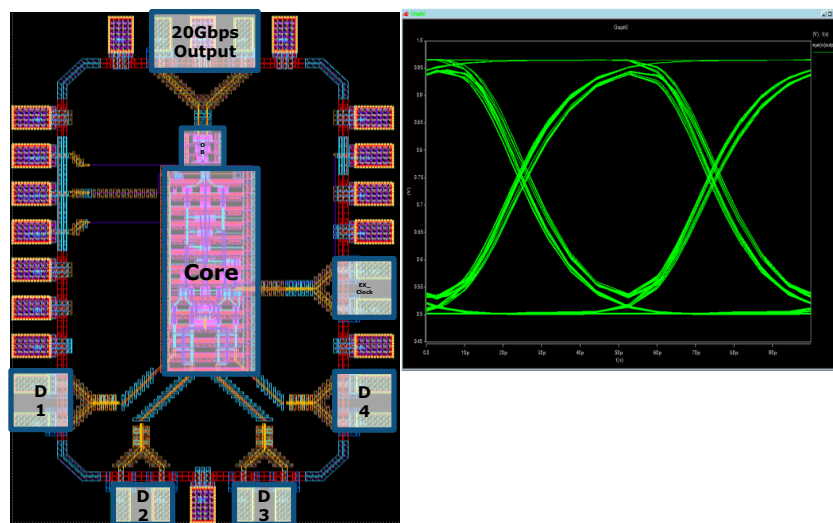
- Block diagram



- Design spec

- ✓ Input : 5-Gb/s data  
10-GHz clock
- ✓ Output : 20-Gb/s data
- ✓ Output swing : 500mV
- ✓ Power consumption : 208mW  
(Serializer, OB)
- ✓ Area : 225um x 625um

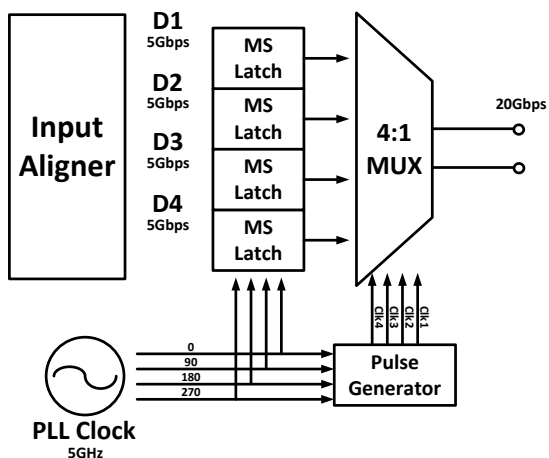
- Layout & Eye-diagram



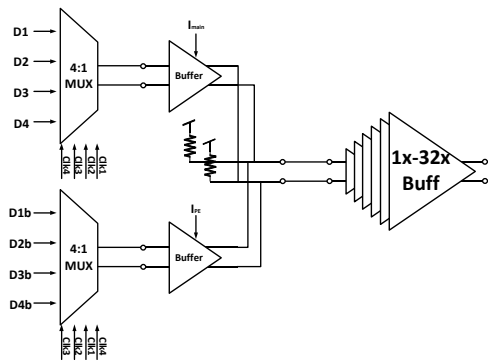
# 4:1 Serializer – 20-Gb/s Optical Transmitter

- 4:1 MUX one stage with pre-emphasis

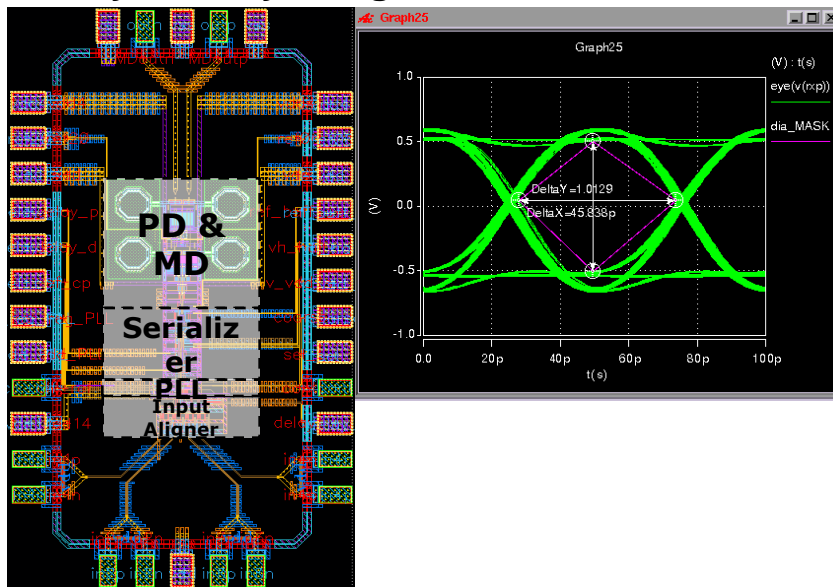
- Block diagram



- Pre-emphasis for BW compensation



- Layout & Eye-diagram



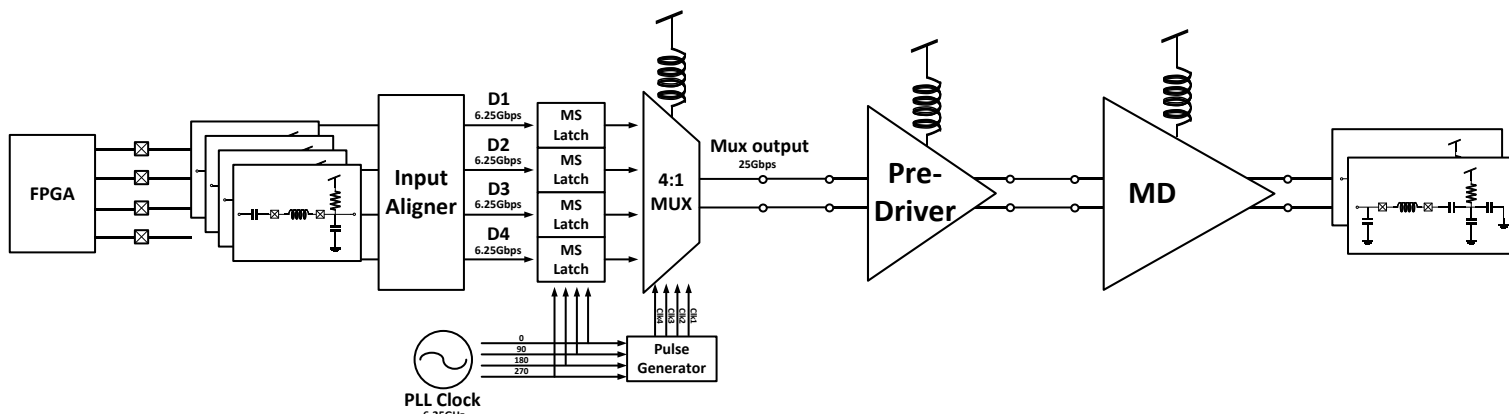
- Design spec

- ✓ Input : 5-Gb/s data  
156.25-MHz reference clock
- ✓ Output : 20-Gb/s data
- ✓ Output swing : 600mV
- ✓ Power consumption : 58mW  
(Serializer, PLL, OB)
- ✓ Area : 200um x 331um

# 4:1 Serializer – 25-Gb/s Optical Transmitter

- 4:1 MUX one stage with inductor

- Block diagram – Full transmitter



- Design spec

- ✓ Input : 6.25-Gb/s data  
195.3125-MHz reference clock
- ✓ Output : 25-Gb/s data
- ✓ Output swing : 600mV
- ✓ Power consumption : 58mW  
(Serializer, PLL, OB)
- ✓ Area : 530um x 450um

- Layout & Eye-diagram

