

## DESIGN SERVICE

IHP offers full-custom circuit design service for high-speed fiber optics systems. According to your individual needs, we design electro-optical circuits or use available design IPs to fulfill your technical requirements. All designs are fabricated at IHP

Technical Requirements



Feasibility Study



Individual IC Design



Fabrication

- Hybrid-integrated design in IHPs 0.13  $\mu\text{m}$  and 0.25  $\mu\text{m}$  SiGe BiCMOS technologies
- Monolithic-integrated photonic transmitters and receivers in IHP's 0.25  $\mu\text{m}$  photonic SiGe BiCMOS technology
- Transimpedance amplifiers and drivers for monolithic silicon photonics integration

**Design your circuits  
based on available  
IPs in IHP's  
technologies!**



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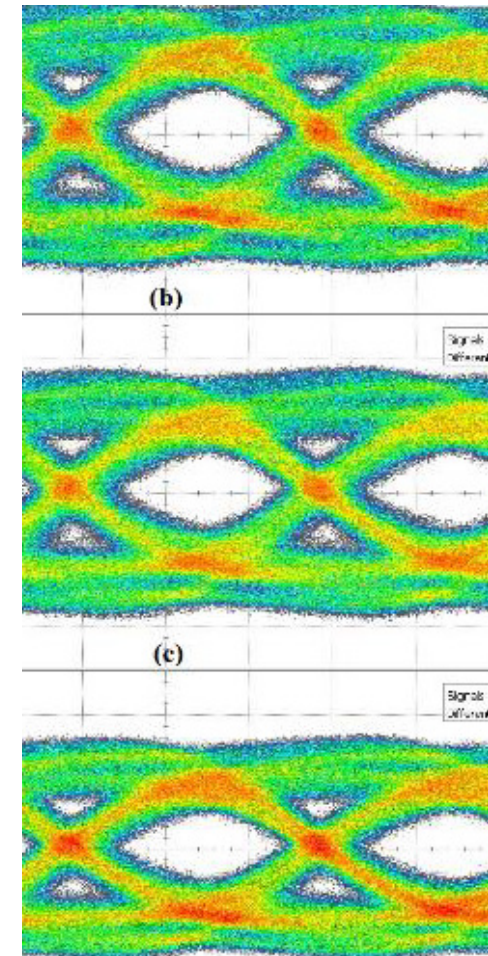


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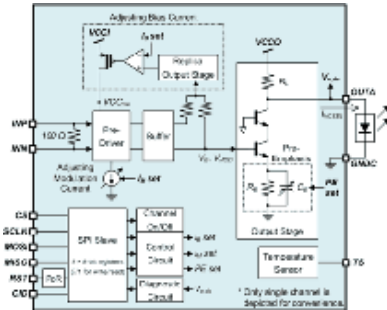
High Speed  
Fiber Optics



Transmitters and Receivers

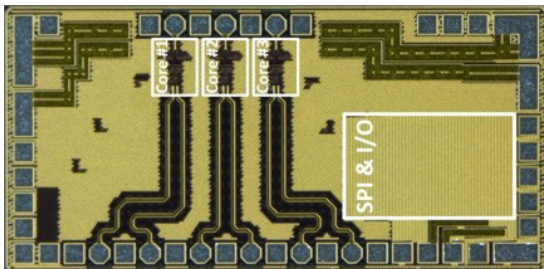


## Drivers for VCSEL Modulators

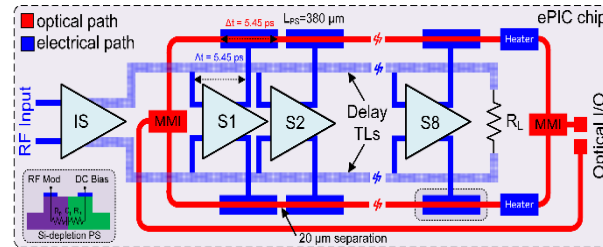


### FEATURES

- Optimized for energy-efficient VCSEL operated at low driving currents
- Multi-channel common-cathode VCSEL driver with high-speed, low-power operation: >25 Gb/s/channel, <45 mW/channel
- Space-grade design: Temperature-independent VCSEL currents, rad-hard digital circuitry
- Channel-independent digital control via SPI: Channel on/off, VCSEL bias/modulation currents, pre-emphasis, VCSEL diagnosis

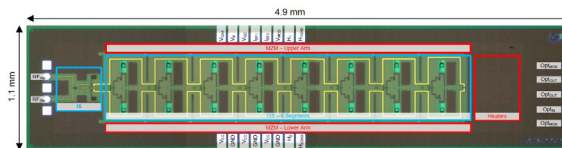


## Segmented Drivers for Integrated Mach-Zehnder Modulators

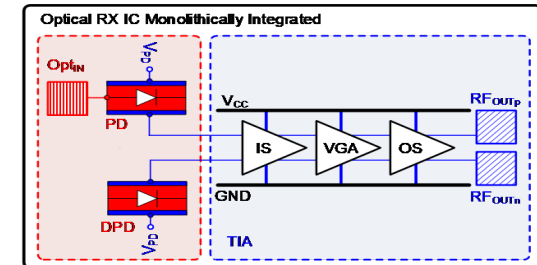


### FEATURES

- All-in-one driver and modulator monolithically integrated in SiGe EPIC technology
- Segmented driver to keep the applied voltage constant for long modulators
- Segmented configuration permits electrical and optical waves to be matched
- Driver features linear amplifiers enabling compatibility with an external DAC to transmit signals with high-order modulation formats
- Availability of integrated optical DAC
- 8 segments for a power consumption of only 450 mW
- Electro-optical bandwidth of 45 GHz
- Data-rate up to 64 Gb/s



## Linear Transimpedance Amplifiers for Integrated Photonic Receivers



### FEATURES

- All-in-one transimpedance amplifier and photodiode monolithically integrated in SiGe EPIC technology
- 80 Gb/s direct detection integrated photonic receiver
- Manual gain control and automatic gain control
- 44 GHz of optical-electrical 3-dB bandwidth over all gain settings of the transimpedance amplifier
- Transimpedance gain of 52 dBΩ and input overload current up to 1.5 mA<sub>pp</sub>

