A Dual-Channel Low-Power VCSEL Driver ASIC for High-energy Physics Experiments

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21st IEEE Real Time Conference
Williamsburg, VA, USA
14 June 2018
The VCSEL driver ASIC is named LOCId65 and designed in a commercial 65-nm CMOS technology.

It contains two separate channels. The two channels share an I\(^2\)C.

We use several techniques to push the driver speed up to 14 Gbps.

Power dissipation is 67 mW/channel at the VCSEL voltage of 3.3 V.

The chip passed eye diagram test and survived 4.9 kGy(SiO2) in the irradiation test.

LOCId65 is a perfect match with the serializer-deserializer ASIC lpGBT in single- or dual-channel optical transmitters in HL-LHC upgrade applications.