

Figure 10 shows the measured bit error rate versus the receiver input optical power considering 8.25 dB of coupling loss. A bit error rate lower than $1\text{E-}9$ has been measured for an input optical power of 13.75 dBm.

6. Conclusion

A DQPSK receiver operating at 50 Gb/s and integrated in the hybrid Si/InGaAs platform has been designed and fabricated. The 30 μm long integrated photodiodes show a 3dB bandwidth higher than 25GHz and a responsivity of 0.64 A/W. The integrated delay interferometer has been designed for a 40 ps delay line and delay line loss compensation; the measured delay time is 39.2 ps with an extinction ratio higher than 20dB.

Single polarization operation of the receiver is demonstrated for a 25 Gb/s DPSK TE polarized signal demodulated by a single branch of the receiver; the transmission results show a BER = $1\text{E-}9$ for a received power equal to 13.75 dBm.

The proposed DQPSK receiver does not include a polarization multiplexing (PM) scheme and the integration of the polarization splitter-rotator as proposed in [18] could enable the demodulation of a PM-DQPSK signal at 100 Gb/s.

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