

# **Abstract**

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## **A Free Space Optical Link in a Laboratory Environment**

This paper implements an experimental free space optical 1 m link. A simple low speed transmitter and a receiver are designed and implemented, and then the received voltage is measured. An investigation for different noise effects is conducted in a simulation for the transmission link. Theoretical bit error rate (BER) is calculated at the track end by eye diagram analysis and then compared with the simulation optical sensitivity at BER of  $10^{-9}$ . A reliable link is obtained at data rates ranging from 512 kb/s up to 5 Mb/s according to the available data source and can be extended to higher data rates. A clear wide eye pattern is obtained with theoretical BER  $\approx 10^{-9}$ .