25th International Conference on Telecommunications
Proceedings ICT
26-28 June 2018, St. Malo, France,
pag. 279-282, INSPEC Accession Number: 18111804

Quasi-Optical Schottky Barrier Diode Detector for mmWave/sub-THz Wireless Communication

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https://doi.org/10.1109/ICT.2018.8464871

Abstract

We report on the development of a compact quasioptical zero-bias Schottky barrier diode (QO-SBD) envelope detector for mmWave/sub-THz frequencies. The detector consists of a Schottky diode mounted on a self-complementary bowtie antenna mounted over a hyper-hemispherical silicon lens. The device is optimised to be used for multi-Gbps wireless communication systems. To increase the video bandwidth of the receiver, a wideband impedance matching network is designed and integrated. Measurements show that a 3-dB video bandwidth of 10GHz is realised for the proposed receiver, which is the highest value achieved for a wide-band QO-type detector.