Abstracts

Low phase noise signal generation circuits for 60 GHz wireless broadband system

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Demand for large capacity and low installation costs explains the extensive use of millimeter wave frequencies in digital wireless broadband communications. In digital wireless systems, the achievable bit error rate is strongly dependent on low phase noise in millimeter wave signal sources. The low phase noise can be achieved with frequency multiplication of high performance microwave oscillators. This study aims to reduce the size of millimeter wave frequency doublers by evaluating the spiral transmission line transformer as a means to minimize the size of the balun. As a result we developed a millimeter wave frequency doubler, which used only 0.3 mm/sup 2/ area on MMIC. We also present theoretical evaluation and simulation of these novel balanced frequency doublers. Furthermore, a 60 GHz frequency doubler was designed to demonstrate the frequency doublers in a millimeter wave signal source with ultra low phase noise.

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