Abstracts

A Planar Wideband 80-200 GHz Subharmonic Receiver

B.K. Kormanyos, P.H. Ostdiek, W.L. Bishop, T.W. Crowe and G.M. Rebeiz. "A Planar Wideband 80-200 GHz Subharmonic Receiver." 1993 Transactions on Microwave Theory and Techniques 41.9 (Oct. 1993 [T-MTT] (Special Issue on Quasi-Optical Techniques)): 1730-1737.

A wideband planar subharmonic mixer has been designed for millimeter-wave operation. The receiver consists of a novel back-to-back Schottky-diode pair integrated at the base of a wideband log-periodic antenna and placed on a silicon lens. The wideband planar receiver results in state-of-the art-performance at 90 GHz (and 182 GHz) with a double-sideband conversion loss and noise-temperature of 6.7 dB (and 8.5 dB) and 1080 K (and 1820 K), respectively. These results are about 3 dB higher than the best tuned waveguide subharmonic mixers using planar diodes. The design is well suited for higher frequencies (up to 1 THz) and for the inclusion of biased back-to-back planar diodes to ease the LO power requirements. The planar subharmonic approach results in an inexpensive wideband receiver and the design can be easily extended to receiver arrays.

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