Abstracts

A Quasi-Optical Subharmonically-Pumped Receiver Using Separately Biased Schottky Diode Pairs

T.-H. Lee, C.-Y. Chi, J.R. East, G.M. Rebeiz and G.I. Haddad. "A Quasi-Optical Subharmonically-Pumped Receiver Using Separately Biased Schottky Diode Pairs." 1994 MTT-S International Microwave Symposium Digest 94.2 (1994 Vol. II [MWSYM]): 783-786.

A novel quasi-optical planar subharmonically-pumped receiver including a log-periodic antenna and an anti-parrallel Schottky diode pair with independent bias is presented. The antenna and Schottky diode pair have a 20 µm and 2.5 µm wide split, respectively, for biasing considerations and an overlay capacitor for RF coupling. Millimeter-wave measurements at 91 GHz show that, at ±0.4 V bias, the separately biased subharmonic mixer requires 2-3 times less LO power than the zero-biased subharmonic mixer for the same 8 dB (SSB) conversion loss. At 180 GHz a similar LO power requirement reduction has been achieved, with a minimum conversion loss of 9.7 dB and noise temperature of 1850°K (DSB).

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