Abstracts

An 86-106 GHz Quasi-Integrated Low Noise Schottky Receiver

W.Y. Ali-Ahmad, W.L. Bishop, T.W. Crowe and G.M. Rebeiz. "An 86-106 GHz Quasi-Integrated Low Noise Schottky Receiver." 1993 Transactions on Microwave Theory and Techniques 41.4 (Apr. 1993 [T-MTT]): 558-564.

An integrated planar receiver has been developed and tested over the 82-112 GHz bandwidth. The quasi-integrated antenna used in the receiver has a high gain, a high Gaussian coupling efficiency and a wide bandwidth. The novel mixer design consists of a planar GaAs Schottky diode placed at the feed of a dipole-probe suspended inside an integrated horn antenna. The diode uses an etched surface channel and a planar air bridge for reduced parasitic capacitance. At 92 GHz, the room temperature antenna-mixer exhibits a double sideband conversion loss and noise temperature of 5.5 ± 0.5 dB and 770 K ± 50 K, respectively. The measured DSB conversion loss and noise temperature over a 20 GHz bandwidth (86 GHz-106 GHz) remain less than 6.2 dB ± 0.5 dB and 1000 K ± 50 K, respectively. The low cost of fabrication and simplicity of the design makes it ideal for millimeter- and submillimeter-wave receivers.

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