Abstracts

A Monolithic 250 GHz Schottky-Diode Receiver (Dec. 1994, Part II [T-MTT])

S.S. Gearhart and G.M. Rebeiz. "A Monolithic 250 GHz Schottky-Diode Receiver (Dec. 1994, Part II [T-MTT])." 1994 Transactions on Microwave Theory and Techniques 42.12 (Dec. 1994, Part II [T-MTT] (1994 Symposium Issue)): 2504-2511.

A 250 GHz monolithic Schottky-diode receiver based on a double-slot antenna is presented. The double-slot antenna is placed on an extended hemispherical high-resistivity silicon substrate lens. The measured DSB conversion loss and noise temperature at 258 GHz are 7.8 ± 0.3 dB and 1600 ± 100K for the antenna-mixer, respectively. A nonoptimal polyethylene lambda d/4 matching-cap layer for the silicon lens improves the conversion loss and noise temperature by 1 dB, and another 0.7 dB improvement could be obtained with the use of a more optimal matching cap layer. The uniplanar double-slot antenna receiver is less than 0.3x1 mm in size including the IF filter and represents the first fully monolithic 250 GHz receiver to date. The measured performance is within 2-3 dB of the best 200/sup +/ GHz waveguide receivers using planar Schottky diodes.

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