Abstracts

Design and Characterization of High Performance 60 GHz Pseudomorphic MODFET LNAs in CPW-Technology Based on Accurate S-Parameter and Noise Models (Dec. 1992 [T-MTT])

M. Schlechtweg, W. Reinert, P.J. Tasker, R. Bosch, J. Braunstein, A. Hulsmann and K. Kohler. "Design and Characterization of High Performance 60 GHz Pseudomorphic MODFET LNAs in CPW-Technology Based on Accurate S-Parameter and Noise Models (Dec. 1992 [T-MTT])." 1992 Transactions on Microwave Theory and Techniques 40.12 (Dec. 1992 [T-MTT] (1992 Symposium Issue)): 2445-2451.

An accurate database for active and passive MMIC components valid up to millimeter-wave frequencies has been established. The CAE models for the transistors and the passive CPW-components, which include the coplanar T-junction, are derived from on-wafer S-parameter measurements up to 63 GHz. For noise modeling of the MODFETs up to millimeter-wave frequencies, we have pursued a novel approach which is based on the temperature noise model reported by Pospiezalski. The parameter T/sub d/ which is required for the temperature model, is extracted from on-wafer noise parameter measurements up to 18 GHz. Using this database, we have designed and fabricated low noise V-band 2-stage amplifiers using pseudo-morphic MODFETs on GaAs substrate which have a performance of 10.5 dB gain and 5.2 dB noise figure at 58.5 GHz. A very good agreement between simulated and measured MMIC gain and noise performance is achieved up to V-band.

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