Abstracts

A W-Band Multifunction MMIC

H.C. Huang, P. Laux, J.F. Bass, S.W. Chen, T.T. Lee, S. Tadayon, J.L. Singer, J. Kearney and O.A. Aina. "A W-Band Multifunction MMIC." 1994 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 94.1 (1994 [MCS]): 37-40.

A 94-GHz multifunction monolithic microwave integrated circuit (MMIC) incorporating two different materials on the same chip has been developed. This MMIC contains a three-stage pseudomorphic high-electron mobility transistor (P-HEMT) low-noise amplifier (LNA) and a balanced gallium arsenide (GaAs) Schottky diode mixer. The MMIC achieved a 7-dB conversion gain with 7.3-dB noise figure over the 93- to 94.5-GHz band. It was fabricated using vacuum passivation technology for the LNA to alleviate possible traps at the SiN-GaAs interface. The technology for incorporating two different materials on the same chip is sufficiently flexible to be applied to analog/digital ICs and microwave/optical optoelectronic ICs as well. This is believed to be the first report of a W-band multifunction MMIC having different materials on the same chip.

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