Abstracts

2-4 GHz Monolithic Lateral p-i-n Photodetector and MESFET Amplifier on GaAs-on-Si

S.N. Subbarao, D.W. Bechtle, R.J. Menna, J.C. Connolly, R.L. Camisa and S.Y. Narayan. "2-4 GHz Monolithic Lateral p-i-n Photodetector and MESFET Amplifier on GaAs-on-Si." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1199-1203.

The design, fabrication, and evaluation of a monolithic lateral p-i-n photodetector and a MESFET amplifier on GaAs-on-Si are described. The GaAs-on-Si was grown by MOCVD. The low-capacitance p-i-n detector is fabricated directly on the high-resistivity GaAs buffer layer in an MMIC-compatible process. A quantum efficiency exceeding 60% has been measured for the p-i-n detectors. The 2 to 4 GHz frequency responses of one and two-stage p-i-n/FET preamplifiers are presented. The response varies ±3 dB over the frequency band. These results are comparable to those of a similar circuit fabricated on a GaAs substrate.

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