Abstracts

Characterization of GaInP avalanche transit time device in millimeter-wave frequencies

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GaInP material has high breakdown electrical fields and thus is suitable to avalanche transit time device application. Millimeter-wave GaInP IMPATT devices at operating temperature (500 K) are analyzed by a large signal model in this paper. The simulation confirms that GaInP IMPATT device has the power density advantage when compared to conventional GaAs and Si IMPATT devices. The improvement in power density is about factor of 4 at 100 GHz. Moreover, GaInP IMPATT devices are easy to incorporate into GaAs millimeter-wave monolithic integrated circuit technology because of the lattice-match and high etching selectivity between GaInP and GaAs materials.

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