Abstracts

A Study of High Power Pulsed LSA GaAs Devices

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Some properties of high power pulsed GaAs diodes operated in the LSA-mode have been investigated. The present study involves both boat grown, here referred to as "bulk", as well as epitaxial GaAs. The quality of epitaxial GaAs is higher than the quality of bulk GaAs, especially with respect to random doping fluctuations and compensation of carriers. In the case of LSA operation fluctuations in doping density requires light loading of the oscillator in order to prevent formation of high field domains resulting in lower efficiencies. The compensation of bulk GaAs gives rise to a negative temperature coefficient of resistivity which severely limits the operation at high duty cycles or over wide temperature ranges. However, as of yet no epitaxial GaAs is available with thicknesses suitable for very high peak power LSA diodes, bulk material has been partly used in the present investigation to demonstrate the power capabilities and operating conditions of LSA diodes. Some recent results with epitaxial GaAs diodes operated in thick waveguide iris circuits are discussed in the latter part of the paper.

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