Abstracts

GaAs on Si as a Substrate for Microwave and Millimeter-Wave Monolithic Integration (Short Papers)

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Recent advances in GaAs growth on Si have resulted in high-quality and high-performance GaAs electronic and optoelectronic devices on Si substrates. One therefore must consider this composite structure as a substrate material for microwave and millimeter-wave monolithic integrated circuits. In order for GaAs on Si to be practical for this purpose, the dielectric loss must be small. We have calculated the dielectric losses of GaAs/Si composite in a transmission line configuration and compared them with those of other possible substrates, such as GaAs and Si alone, in the frequency range of 10-100 GHz. Depending upon the thickness, results show that high-resistivity GaAs epitaxial layers on Si substrates having moderate resistivities reduce the dielectric loss.

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