388. Title:Antimonide-based pN terahertz mixer diodes
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Abstract:High frequency pN heterojunction diodes with cutoff frequencies over 1 THz have been fabricated using narrow bandgap high-mobility semiconductors. The pN heterojunction is composed of a 30 nm thick p -type In0.27 Ga0.73 Sb alloy and a 130 nm thick In0.69 Al0.31 As0.41 Sb0.59 n -layer. A high-mobility n -type InAs0.66 Sb0.34 contact layer is used to connect the mesa diode to a metal Ohmic contact. These alloys have a lattice constant a0 =6.2 A˚ and are grown on semi-insulating GaAs, a0 =5.65 A˚, using a buffer consisting of 1 μm of In0.21 Ga0.19 Al0.6 Sb with a0 =6.2 A˚ and 0.5 μm of Ga0.35 Al0.65 Sb with a0 =6.12 A˚.