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Title:Quantitative analysis of the trapping effect on terahertz AlGaN/GaN resonant tunneling diode
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Abstract:We report on a simulation for terahertz aluminum gallium nitride (AlGaN)/gallium nitride (GaN) resonant tunneling diode (RTD) at room temperature by introducing deep-level defects into the polarized AlGaN/GaN/AlGaN quantum well. Results show that an evident degradation in negative-differential- resistance characteristic of RTD occurs when the defect density is higher than ~106 cm-2, which is consistent with the measurements of the state-of-the-art GaN RTDs. At around 300 GHz, the simulation for a RTD oscillator also demonstrates evident decreases of rf power and efficiency because of the electron trapping effect.
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