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Title:Time-Domain Analysis of Large-Signal-Based Nonlinear Models for a Resonant Tunneling Diode with an Integrated Antenna

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Abstract:Large-signal-based nonlinear models are developed to analyze a variety of dynamic performances in a resonant tunneling diode (RTD) with peripheral circuits such as an integrated broad band bow-tie antenna, a bias circuit and a bias stabilizer circuit. Dynamic modes of the RTD are classified by the time-domain analysis with the model. On the basis of our model, we suggest a possibility to discuss a terahertz order oscillation mode control, and the ASK modulation in several tens Gbit/sec in the RTD with the broad band antenna. Validity of the model and analysis is shown by explaining measured results of modulated oscillation signals in fabricated triple-barrier RTDs.

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