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标题: Terahertz current oscillations in a gated two-dimensional electron gas with antenna integrated at the channel ends
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摘要: We studied terahertz current oscillations induced by a frequency-tunable radiation source in a AlGaAs/InGaAs/AlGaAs heterostructure field effect transistor channel. A planar antenna was integrated on-chip, and a substrate lens was used for broadband coupling of free-space radiation at 0.18-0.72 THz to the channel ends. Through spectral analysis of the detection signal, we identified two different mixing mechanisms: one related to channel current oscillations and the other to modulation of the gate-to-channel potential. Depending on gate bias and radiation frequency, the two mechanisms either compete or cooperate, leading to responsivity up to 300 V/W and noise equivalent power of 1 nW/Hz(0.5) (C) 2012 American Institute of Physics. [http://dx.doi.org/10.1063/1.4717464]
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