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标题: Silicon field-effect transistors as radiation detectors for the Sub-THz range
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摘要: The nonresonance response of silicon metal-oxide-semiconductor field-effect transistors (Si-MOSFETs) with a long channel (1-20 mu m) to radiation in the frequency range 43-135 GHz is studied. The transistors are fabricated by the standard CMOS technology with 1-mu m design rules. The volt-watt sensitivity and the noise equivalent power (NEP) for such detectors are estimated with the calculated effective area of the detecting element taken into account. It is shown that such transistors can operate at room temperature as broadband direct detectors of sub-THz radiation. In the 4-5 mm range of wavelengths, the volt-watt sensitivity can be as high as tens of kV/W and the NEP can amount to 10(-11) - 10(-12). The parameters of detectors under study can be improved by the optimization of planar antennas.
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