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Title:Plasma-wave detectors for terahertz wireless communication
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Abstract:We report on terahertz wireless communication experiments at 0.3 THz using 250-nm gate-length GaAs/AlGaAs field-effect transistor (FET) as a detector and unitraveling-carrier photodiode as a source. The physical mechanism of the detection process is terahertz wave rectification on nonlinearities related to overdamped plasma oscillations in the transistor channel. We present an experimental study of rectification bandwidth and show for the first time that room-temperature direct detection with modulation bandwidth of up to 8 GHz can be achieved, thus showing that nanometer-sized FETs can be used as valuable detectors in all-solid-state terahertz wireless communication systems. © 2012 IEEE.
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Uncontrolled terms:All-solid-state - Communications technology - Detection process - Direct detection - Experimental studies - GaAs/AlGaAs - Gate-length - High electron mobility transistor (HEMT) - Modulation bandwidth - Physical mechanism - Room temperature - Tera Hertz - Transistor channels - Uni-traveling-carrier photodiodes - Wireless communication system - Wireless communications

Classification code:932.3 Plasma Physics - 914 Safety Engineering - 761 Nanotechnology - 732.2 Control Instrumentation - 716.1 Information Theory and Signal Processing - 933 Solid State Physics - 716 Telecommunication; Radar, Radio and Television - 714.2 Semiconductor Devices and Integrated Circuits - 711 Electromagnetic Waves - 694 Packaging - 691 Bulk Handling and Unit Loads - 715 Electronic Equipment, General Purpose and Industrial
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