232
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Abstract:We show that dense field-effect-transistor (FET) arrays can effectively couple to incoming terahertz (THz) radiation without using supplementary antenna elements. Intensive plasmon resonances can be excited in GaN-based dense FET arrays in the entire THz frequency range at room temperature due to strong broadband coupling of such devices to THz radiation and high electron density in the GaN-FET channels. An alternative way of increasing the operation temperature of plasmonic THz detectors up to room temperature involves a non-resonant plasmonic detection response in FET arrays. Strong photovoltaic THz response can be obtained in a dense FET array with an asymmetric gate in each individual FET unit of the array. Copyright © 2012 American Scientific Publishers.
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