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Title

High effective terahertz radiation from semi-insulating-GaAs photoconductive antennas with ohmic contact electrodes

Source

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Abstract

Terahertz (THz) radiation efficiency of a photoconductive antenna with Schottky contact electrodes is low because the electrical field is limited to a narrow region close to the anode. However, the electrical field in the gap of an antenna with ohmic contact electrodes is more uniform, which contributes to improving THz generation efficiency. In this paper, the semi-insulating (SI)-GaAs antennas with ohmic contact electrodes and SI-GaAs antennas with Schottky contact electrodes were fabricated by using AuGeNi alloy electrodes and Ti/Au electrodes, respectively. The voltage-ampere characteristic and the distribution of electrical field of the two kinds of antennas were tested. At the same condition, the THz intensity from the antenna with ohmic contact electrodes was 3-8 times higher than that from the antenna with Schottky contact electrodes, and the larger gap antennas with ohmic contact electrodes have higher optical and electrical energy to THz intensity conversion efficiency. (21 References).