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Title:Ultrafast photoconductors from low-temperature-grown GaAs for terahertz components activated by femtosecond 1-μm wavelength laser pulses
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Abstract:Terahertz time-domain spectroscopy (TDS) system based on femtosecond Yb:KGW laser, photoconductive emitters and detectors made using low-temperature-grown (LTG) GaAs layers annealed at moderate temperatures (∼400 °C) was demonstrated. Measured photoexcited charge carriers concentration of these layers increased lineary with an optical power, showing that the transitions from defect band to conduction band are dominant. The largest amplitude THz pulse was emitted by the device made from the LTG-GaAs layer annealed at 420 °C temperature with useful signal bandwidth reaching 3 THz. On the other hand, detectors made from this material were more than an order of magnitude less sensitive than conventional GaBiAs detectors. © 2012 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim.
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Controlled terms:Gallium arsenide - Photoconductive switches - Semiconducting gallium - Temperature - Ytterbium
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