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Title:Reliability investigation of photoconductive continuous-wave terahertz emitters

Authors:Gobel, Thorsten (1); Schoenherr, Daniel (2); Sydlo, Cezary (3); Feiginov, Michael (3); Meissner, Peter (3); Hartnagel, Hans Ludwig (2)

Author affiliation:(1) Photonic Components Department, Fraunhofer Institute of Telecommunications, Heinrich Hertz Institut, 10587 Berlin, Germany; (2) Microwave Electronics Department, Technische Universität Darmstadt, 64283 Darmstadt, Germany; (3) Optical Communications Department, Technische Universität Darmstadt, 64283 Darmstadt, Germany

Corresponding author:Gobel, T.(thorsten.goebel@hhi.fraunhofer.de)

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Abstract:The lifetime of photomixers depends significantly on the operation conditions. High values of bias voltage and/or optical power increase the emitted terahertz power, but considerably decrease the operation lifetime. Interdigitated finger photomixers especially face the problem of thermal destruction due to high current densities. We present an Arrhenius analysis of low-temperature-grown-GaAs photomixers and link the photomixer lifetime to the accessible signal-to-noise ratio (SNR). With a coherent continuous-wave terahertz system designed for 1000 operating hours, we achieve an SNR of 30 dB at 1 THz using an integration time of 500 ms.

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