

标题: Characteristics of THz carrier dynamics in GaN thin film and ZnO nanowires by temperature dependent terahertz time domain spectroscopy measurement

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摘要: We present a comprehensive study of the characteristics of carrier dynamics using temperature dependent terahertz time domain spectroscopy. By utilizing this technique in combination with numerical calculations, the complex refractive index, dielectric function, and conductivity of n-GaN, undoped ZnO NWs, and Al-doped ZnO NWs were obtained. The unique temperature dependent behaviors of major material parameters were studied at THz frequencies, including plasma frequency, relaxation time, carrier concentration and mobility. Frequency and temperature dependent carrier dynamics were subsequently analyzed in these materials through the use of the Drude and the Drude-Smith models. (C) 2012 Elsevier Ltd. All rights reserved.

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