

Optical properties of GaAs_{1-x}N_x on GaAs[Abstract](#)[References](#)[Citing Articles \(17\)](#)[Download: PDF \(81 kB\)](#) [Export: BibTeX or EndNote \(RIS\)](#)

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The optical properties of GaAs_{1-x}N_x with x up to 2.5% grown by metalorganic chemical vapor deposition on GaAs(001) substrates are reported. Fundamental band gaps are obtained by photorefectance measurements. Room-temperature pseudodielectric functions obtained by spectroscopic ellipsometry in the range from 2.7 to 5.2 eV are modeled with a three-phase structure that accounts for the GaAs_{1-x}N_x layer, native oxide, and ambient. We employ Adachi's critical-point composite model for the parametrization of GaAs_{1-x}N_x, and the compositional dependence of critical-point energies is obtained. While the energy of E_0 decreases with x , those of E_1 and $E_1+\Delta_1$ increase with x . This fact, somewhat anomalous compared with conventional III-V alloys, indicates that the lowest-lying conduction bands along $\langle 111 \rangle$ directions may be perturbed by the incorporated nitrogen.

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