

Determination Of Bandgap Narrowing And Parasitic Energy

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Determination of Bandgap Narrowing and Parasitic Energy Barriers in SiGe HBT’s Integrated in a Bipolar Technology
Benedicte Le Tron, M. D. R. Hashim, Peter Ashburn, Mireille Mouis, Alain Chantre, and Gilbert Vincent Abstract—
This paper describes a method for characterizing the bandgap narrowing and parasitic energy barrier in SiGe hetero-

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Determination of bandgap narrowing and parasitic energy barriers in SiGe HBT's integrated in a bipolar technology
June 1997 IEEE Transactions on Electron Devices 44(5):715 - 722

(PDF) Determination of bandgap narrowing and parasitic ...

The energy band gap narrowing effect in heavily C-doped GaAs was investigated using photoluminescence spectroscopy. The band gap was determined over the hole density range 10^{17} - 4×10^{20} cm⁻³ at 10 and 300 K. The band gap data at low temperatures confirm the available theoretical calculations up to 10^{20} cm⁻³. An unexpected temperature dependence of the observed band gap at high doping ...

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Band gap narrowing of doped compounds with respect to pure ZnO

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can be said to be mainly due to the downward shifts of the conduction band (Fig. 18) for both the nanostructured and micron materials. Thus, mechanisms for band gap narrowing and widening in materials are very complex processes depending on whether they are nano- or micron-sized crystallites and the type of elements involved in the doping process.

Band Gap Narrowing and Widening of ZnO Nanostructures and ...

Band gap change in doped ZnO is an observed phenomenon that is very interesting from the fundamental point of view. This work is focused on the preparation of pure and single phase nanostructured ZnO and Cu as well as Mn-doped ZnO for the purpose of understanding the mechanisms of band gap narrowing in the materials. ZnO, Zn_{0.99}Cu_{0.01}O and Zn_{0.99}Mn_{0.01}O materials were prepared using a wet ...

Band Gap Narrowing and Widening of ZnO Nanostructures and ...

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Band gap narrowing (BGN) is one of the crucial heavy-doping effects to be considered for bipolar devices. Using a physically-based approach (E.F. Schubert, Doping in III-V Semiconductors, Cambridge University Press, 1993), we suggest a new

Study of dopant-dependent band gap narrowing in compound ...

The basic assumption in our model is that band gap narrowing is a result of five types of many-body interactions (electron-electron, electron-impurity, hole-hole, hole-impurity, and electron-hole). At high doping concentrations we assume the electron-impurity contribution to be dominant. Though band gap narrowing is very difficult

A Dopant-Dependent Band Gap Narrowing Model Application ...

A plot of the resulting bandgap versus temperature is shown in the figure below for germanium, silicon and gallium arsenide. bandgap.xls - eband.gif.

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Fig.2.2.14 Temperature dependence of the energy bandgap of germanium (bottom/black curve), silicon (blue curve) and GaAs (top/red curve).

2.2.5 Temperature dependence of the energy bandgap

The bandgap narrowing AEG is assumed independent of temperature.

Rearranging terms and taking the natural logarithm one can write $\ln I_{ca}(T)/T^{1+3-a} = \ln I_{cic} + (-E_G(0) + AEG)/kT$ (8) Knowing $E_G(0)$ (Table 1), the bandgap narrowing AEG can be directly evaluated from slope of the plot representing the quantity at the left hand side of (8) versus $1/T$.

Accurate determination of bandgap narrowing in heavily ...

Determination of band-gap narrowing in heavily doped n-type GaAs and n-type GaInP from solar cell performance
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Determination of band-gap narrowing in heavily doped n ...

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Empirical determination of the energy band gap narrowing in highly doped n+ silicon Di Yan and Andres Cuevas

Citation: J. Appl. Phys. 114, 044508 (2013); doi: 10.1063/1.4816694

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electronic band gap. Exciton binding energies, d-d transitions, phonon absorption and emissions, and excitations to or from defect bands and color centers can complicate interpretation of UV-vis spectra; nevertheless, an estimation of the optical band gap is obtainable. Furthermore, UV-vis allows for the characterization of this electronic

The Use of UV-visible Spectroscopy to Measure the Band Gap ...

Empirical determination of the energy band gap narrowing in highly doped n+ silicon J. Appl. Phys. 114, 044508 (2013); 10.1063/1.4816694 Electronic properties of titanium in boron-doped silicon analyzed by temperature-dependent photoluminescence and injection-dependent photoconductance lifetime spectroscopy

Empirical determination of the

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energy band gap narrowing ...

Abstract. The energy band gap narrowing effect in heavily C-doped GaAs was investigated using photoluminescence spectroscopy. The band gap was determined over the hole density range 10^{17} - 4×10^{20} cm⁻³ at 10 and 300 K. The band gap data at low temperatures confirm the available theoretical calculations up to 10^{20} cm⁻³. An unexpected temperature dependence of the observed band gap at high ...

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