The Diffusivity-Mobility Relationship of Heavily Doped Semiconductors Exhibiting a Non-Parabolic Band Structure and Bandgap Narrowing

Atanu Das[a] and Arif Khan[b]

[a] Department of Physics and Techno Physics, Vidyasagar University, Midnapore 721 102,
West Bengal, India
[b] Electrocom Corporation, P. O. Box 60317, Potomac, MD 20859-0317, USA

Reprint requests to A. K.; E-mail: a.khan123@yahoo.com and akhan@electrocom-corp.com

Z. Naturforsch. **62a,** 605 – 608 (2007); received April 27, 2007

A relationship between the mobility and diffusivity of semiconductors exhibiting bandgap narrowing has been presented. The relationship is general and applicable to both non-degenerate and degenerate semiconductors under an applied bias. It is suitable for the investigation of the electrical transport in heavily doped semiconductors.

Key words: Diffusivity-Mobility Relationship; Bandgap Narrowing; Heavily Doped Semiconductors.