

Citation:

Hui Zhao, *Temperature dependence of ambipolar diffusion in silicon-on-insulator*, [Applied Physics Letters](#) 92, 112104 (2008).

Published version:

Published version: http://apl.aip.org/applab/v92/i11/p112104_s1

Other sources:

ArXiv: <http://arxiv.org/abs/0806.3900>

Key words:

Mesoscale and Nanoscale Physics
Materials Science

Abstract:

Spatiotemporal dynamics of electron-hole pairs locally excited in a silicon-on-insulator structure by indirect interband absorption are studied by measuring differential transmission caused by free-carrier absorption of a probe pulse tuned below the bandgap, with 200-fs temporal and 3-micrometer spatial resolution. From sample temperatures of 250 K to 400 K, the ambipolar diffusivity decreases, and is similar to reported values of bulk silicon. Cooling the sample from 250 K to 90 K, a decrease of ambipolar diffusivity is observed, indicating important influences of defects and residual stress on carrier diffusion. No detectable density dependence of ambipolar diffusivity is observed.