

PHOTOTHERMOACOUSTIC EFFECT IN A
PIEZOELECTRIC–SEMICONDUCTOR
LAYERED STRUCTURE

L.A. Bulavin, V.V. Kozachenko, S.V. Khrapatiy

Taras Shevchenko National University of Kyiv
(64, Volodymyrska Str., Kyiv 03127, Ukraine;
e-mail: khrapatiysv@ukr.net)

S u m m a r y

The results of theoretical and experimental studies of the photothermoacoustic effect in a layered piezoelectric–semiconductor plate are reported. To avoid the influence of optical irradiation on the physical properties of a semiconductor, thermal waves were excited in a piezoelectric. An expression describing the dependence of the potential difference across the piezoelectric layer on the physical and geometrical parameters of the structure under study is derived. The amplitude–frequency dependence of an information-bearing signal was experimentally studied, by using a layered x -cut quartz–silicon plate. The fitting of experimental data within the theoretical model allowed us to determine the reduced Young modulus of silicon.