

CONDUCTIVITY AND PHOTO-INDUCED
CONDUCTIVITY OF TWO-DIMENSIONAL
MACROPOROUS SILICON STRUCTURES

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S u m m a r y

The effective conductivity and the photoconductivity in two-dimensional macroporous silicon structures have been measured, and their dependences on the macropore concentration and diameter have been calculated. The effective conductivity of macroporous silicon structures is found to decrease as the concentration and the volume fraction of pores grow. A size effect was revealed, a significant reduction in the thickness of the space charge region at small macropore diameters (the surface charge) is observed. The effective relative photoconductivity is found to be governed by the charge recombination and accumulation on the pore surface. Theoretical dependences of the relative photoconductivity in the examined structures are found to correspond to a surface recombination rate of 90 cm/s.