

INFLUENCE OF δ -LAYERS
ON THE DARK I-V CHARACTERISTICS
OF Si p - n JUNCTIONS ON THE CURRENT
TRANSPORT THROUGH LOCAL LEVELS

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S u m m a r y

We analyze the dark I-V characteristics of a p-n junction with inserted δ -layers in the space charge region. The electron transport via local levels is considered in the case where charge carriers do not leave the conductive band. The analytic expression obtained for this current allows us to assess the influence of the position of δ -barriers in the space charge region and initial filling of local states on the I-V characteristics. It is shown that, for preferable exchange by charge carriers between local states and the emitter (as well as the base), the current reduces under a shift of the δ -barrier in the space charge region from the emitter border to the base. At a fixed position of the δ -layer, the dependence of the dark current on the initial filling of local states is given by $I \sim M_i / (M_i + \text{const})$ ($M_i = (n_i - m_i^0) / m_i^0$); where n_i is the concentration of local states per unit of area, m_i^0 is the number of electrons in local states at $V = 0$.