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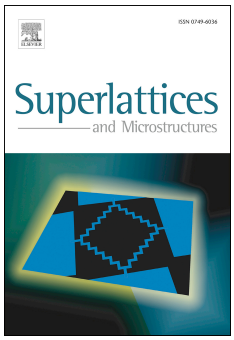

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Alternative Current Source Based Schottky Contact with Additional Electric Field

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Abstract. Additional electric field (AEF) in the Schottky contacts (SC) that covered the peripheral contact region wide and the complete contact region narrow (as TMBS diode) SC. Under the influence of AEF is a redistribution of free electrons produced at certain temperatures of the semiconductor, and is formed the space charge region (SCR). As a result of the superposition of the electric fields SCR and AEF occurs the resulting electric field (REF). The REF is distributed along a straight line perpendicular to the contact surface, so that its intensity (and potential) has a minimum value on the metal surface and the maximum value at a great distance from the metal surface deep into the SCR. Under the influence of AEF as a sided force the metal becomes negative pole and semiconductor - positive pole, therefore, CS with AEF becomes an alternative current source (ACS). The Ni-nSi SC with different diameters (20-1000 microns) under the influence of the AEF as sided force have become ACS with electromotive force in the order of 0.1-1.0 mV, which are generated the electric current in the range of 10-9 - 10-7 A, flowing through the external resistance 1000 Ohm.

Key words: metal - semiconductor contact, Schottky contact, resulting electric field, alternative current source, additional electric field, semiconductor converters

1.**Introduction**

Direct contact of the metal with the semiconductor (Schottky contact) having rectifier or ohmic properties are widely used in modern electronic devices. Due to the development of measurement techniques, especially scanning probe microscopy, increased interest in the detailed study of the electronic processes occurring in multifunctional Schottky contacts (SC) [1-3]. Some features of real SC were identified as opposed to the idealized SC, in which the contact surface is considered homogeneous and unlimited. It turned out that in real SC due to the limitations contact surface with the free surfaces of the contacting materials, arise a potential difference between them and thus additional electric field (AEF) [4-10], which is commensurate with the electric field idealized rectifying SC.

Previously, the established AEF by means of indirect methods, for example, electrophysical, thermionic, constructive - technological experimental methods in real SC [5], in recent years was directly measured by means of atomic force microscopy (AFM) [11-15]. In [11] was a direct measurement of the AEF by AFM on the surface of Au - nGaAs SC with different diameters (5-100 μm). It was found that under the influence of AEF is formed the extended area (aureole) around the perimeter of the contact with the potential that differ 0.5-0.6 V from the potential of the free surface

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