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The invention relates to the field of renewable power engineering and electrical engineering, in particular to semiconductor devices for conversion of solar radiation to electrical energy, and can be used in the manufacture of photoelectric cells and high-temperature semiconductor devices.

The method for manufacturing a semiconductor device with relief *p-n* junction, according to the first embodiment, includes the degreasing in organic solvent and etching in ammonia solution of a semiconductor substrate made as a plate of A^3B^5 *n* or *p*-type compound crystallographically disoriented by 3…5° (100) to (110), formation on it of a relief microstructure, for example, by chemical etching in selective acid solution HCl-HNO_3-H_2O, epitaxial growth on the surface of a first semiconductor layer of a type identical to the substrate, formation of the *p-n* junction by epitaxial growth on the surface of the first layer of the second semiconductor layer of a type opposite to the first layer, removal of layers from the reverse side of the substrate, for example, by mechanical grinding, application of electrical contacts, for example, by applying a metal layer on the surface of the second layer and on the reverse surface of the substrate, and cutting of the resulting structure into crystals.

The method, according to the second embodiment, is characterized in that it includes the epitaxial growth on the substrate surface of a first planar semiconductor layer of a type identical to the substrate, application on the surface of the first layer of a layer of amorphous material of metal oxide hydrate A by dipping the substrate into a saturated solution of metal salt A with pH value 3…4.1, formation on it of a relief microstructure by introduction of substrate at the moment of or after the application of the layer of amorphous material in an alternating magnetic field, heat treatment in vacuum at a temperature of 230…320°C for 2 hours, then – in the environment with the presence of oxygen at a temperature of 550…610°C for 5 minutes, and chemical treatment in an ammonia solution, as well as formation of the *p-n* junction by epitaxial growth on the surface of the relief layer of amorphous material of the second semiconductor layer of a type opposite to the first layer.

Claims: 2