

US Pat. No.: 6,252,287

Technology Readiness Level: 5

Key components have been demonstrated in a relevant environment

Sandia National Laboratories has created a semiconductor p-n heterojunction for use in forming a photodetector that has applications for use in a multi-junction solar cell and detecting light at an energy greater than 0.95-1.2 eV.

This semiconductor is made up of a layer of indium gallium arsenide nitride (InGaAsN) with n-type doping that is epitaxially grown in contact with a layer of gallium arsenide (GaAs) with p-type doping. The InGaAsN/GaAs semiconductor p-n heterojunction of the present invention can be used in combination with semiconductor p-n homojunctions of conventional designs to form an efficient multi-junction solar cell.



TECHNICAL BENEFITS

- Forms an efficient 0.95-1.2eV bandgap photodetector for use in a multifunction solar cell
- Increased solar cell efficiency
- Can reduce satellite mass and launch cost

INDUSTRIES & APPLICATIONS

- Generation of electricity for space photovoltaic applications
- Terrestrial high-concentration photovoltaic applications