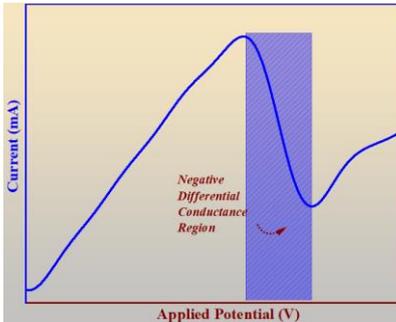


Optically switched resonant-tunneling diode

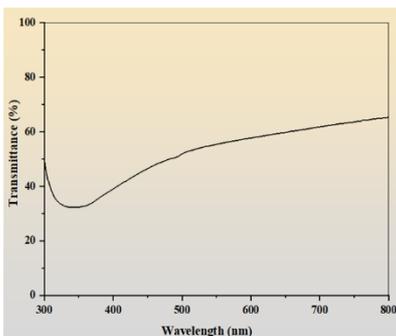
New component for touchscreens and optoelectronic circuits

Invention

Resonant-tunneling diodes are semiconductor components that, due to the quantum mechanical effect of the tunnel, have a current-voltage characteristic with a negative differential resistance. The innovative component consists of an electrically insulating substrate, a metal layer and a transition metal oxide layer with an amorphous structure. These components are constructed from a first contact layer containing aluminum, a V2O5 layer and a second electrical contact. They have the electrical characteristic that is typical of resonant-tunneling diodes with a negative differential resistance range, but remain optically transparent, regardless of the switching state. Due to the materials and process used, resonant-tunneling diodes are easy to manufacture, robust, and particularly temperature-stable.



Working area of the resonant-tunneling diode



Optically transparent and electrically switched resonant-tunneling diode (RTD)

Current Status

Initial laboratory samples and measuring results are available.

An invention of WWU Münster.

Commercial Opportunities

The invention is suitable for the production of self-tunable transparent electronic switches, high-speed oscillators, and transparent memory cells or logic circuits, which are used, for example, in touchscreens and optoelectronic circuits. Its use in optical neuronal networks, smart windows and smart glass applications is particularly interesting as optically transparent switches represent an important feature in them.

A German patent application has been submitted to the DPMA. On behalf of the University of Münster, we offer interested companies the possibility of licensing and, in particular, the further development of the technology with the inventors from the University.

Competitive Advantages

- Transparent component
- Simple manufacturing process
- Robust layer structure
- Scalable layer thicknesses

Technology Readiness Level

123456789

Technology validated in lab

Industries

- Electronic
- Semiconductor

Ref. No.

5871

Contact

Martin van Ackeren

E-Mail: ma@provendis.info

Phone: +49(0)208-94105-34

