



Southern Illinois University System

Applications

- Power electronics
- Solar panel bypass diode
- Solar installation retrofits
- Battery string isolation

Inventor(s)

Andy Lozowski, PhD

Dr. Lozowski is an associate professor of electrical and computer engineering at SIU Edwardsville. He leads SIU Edwardsville's power electronics laboratory and is an entrepreneur specializing in specialty instrumentation and equipment for energy conversion.

Contact

Michelle Chitambar, PhD
Senior Technology Transfer Specialist
Michelle.Chitambar@siu.edu
(618) 453-4544

Signal-Powered Bypass Diode

Blocking diodes—devices that prevent unwanted power flow to increase the safety, reliability, and performance of power equipment—are ubiquitous in energy systems. Schottky diodes have been the standard blocking diode choice for decades, but feature relatively low blocking voltages (insufficient for standard 48-volt systems, for instance), have poor efficiency when operating in bias mode, and are susceptible to thermal runoff due to high operating temperatures.

Invention

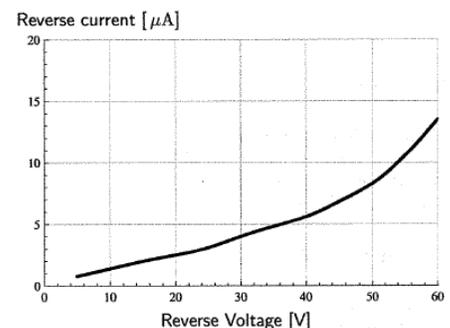
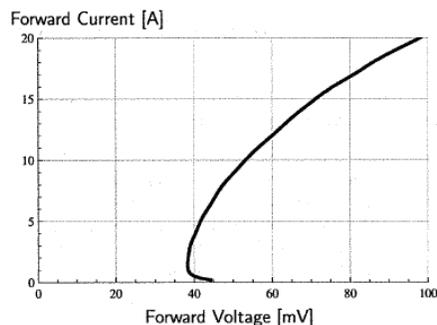
Dr. Lozowski has developed an electronic microcircuit that is behaviorally equivalent to a standard semiconductor Schottky diode, but features higher efficiency; safer, lower-temperature operation; and a larger blocking voltage.

Key Advantages

- High continuous blocking voltage of 60 V
- Lower forward-bias voltage drop than standard Schottky diode
- Stays cool while operating in bypass mode, reducing risk of overheating
- No heat sink required
- Higher bypass-mode efficiency as compared to standard Schottky diode
- Elegant design minimizes failure points for high reliability
- Utilizes robust, well-characterized existing components
- Can be encapsulated in standard diode packages such as DO-247
- Direct replacement for standard Schottky diode in many applications

Status

This technology has been designed, tested, and demonstrated in real-world applications. A provisional patent (62/445,448) was filed in January 2017.



Other opportunities related to this technology, included but not limited to sponsored and/or collaborative research, may be available. Please reach out to the designated contact identified at left for more information.