Novel Current-Blocking Layer in High-Power Current Aperture Vertical Electron Transistors (CAVETs)

Tech ID: 22364 / UC Case 2011-831-0

BRIEF DESCRIPTION

A process for creating a novel type of active current-blocking layer to allow the device current to only pass through the aperture.

BACKGROUND

A Current Aperture Vertical Electron Transistor (CAVET) is a vertical device consisting of an n-type doped drift region to hold voltage and a horizontal region to carry current flowing from the source to the drain through an aperture. A current blocking layer is employed in such devices to block the current from flowing through any other direction but the aperture.

DESCRIPTION

Researchers at the University of California, Santa Barbara have developed a process for creating a novel type of active current-blocking layer to allow the device current to only pass through the aperture. This current-blocking layer effectively restricts the movement of current to only one direction to improve device functionality and reliability. The careful confinement of the device current allows for highly reliable and smooth high-frequency switching as well as high-power switching.

ADVANTAGES

- Simple device manufacturing process
- Improved device reliability and performance
- Smooth high-frequency switching

APPLICATIONS

- High-power & high-frequency switching

PATENT STATUS

Country	Type	Number	Dated	Case

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OTHER INFORMATION

KEYWORDS

CAVET, indcircuit, indssl, indpowerelec, indaltenergy, indmicroelec, indfeat

CATEGORIZED AS

- **Semiconductors**
  - Other

RELATED CASES

2011-831-0

United States Of America	Issued Patent	9,590,088	03/07/2017	2011-831	

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- High-Quality N-Face GaN, InN, AlN by MOCVD
- Defect Reduction in GaN films using in-situ SiNx Nanomask
- A Structure For Increasing Mobility In A High-Electron-Mobility Transistor
- Improved Fabrication of Nonpolar InGaN Thin Films, Heterostructures, and Devices
- Methods for Locally Changing the Electric Field Distribution in Electron Devices
- Technique for the Nitride Growth of Semipolar Thin Films, Heterostructures, and Semiconductor Devices
- (In,Ga,Al)N Optoelectronic Devices with Thicker Active Layers for Improved Performance
- GaN-based Vertical Metal Oxide Semiconductor and Junction Field Effect Transistors
- Iii-N Transistor With Stepped Cap Layers
- III-N Based Material Structures and Circuit Modules Based on Strain Management

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