A Structure For Increasing Mobility In A High-Electron-Mobility Transistor

Tech ID: 27402 / UC Case 2017-462-0

BRIEF DESCRIPTION

A technique that results in a significant increase of electron mobility and sheet charge density at small channel thickness.

BACKGROUND

HEMTs are solid-state electron devices made from a semiconductor heterostructure used to amplify high-frequency signals. Electron mobility is important to device performance and so it is extremely desirable to discover ways to improve electron mobility.

DESCRIPTION

Researchers at the University of California, Santa Barbara have created a channel structure for semiconductor high-electron mobility transistors (HEMTs) that results in a significant increase of electron mobility and sheet charge density at small channel thickness. This enables the fabrication of devices with increased high frequency power performance and allows for better lateral and vertical scalability.

ADVANTAGES

- Increased electron mobility
- Improved device performance (94 GHz)

APPLICATIONS

- High-electron mobility transistors
- Power electronics

PATENT STATUS

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INVENTORS

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OTHER INFORMATION

KEYWORDS

Semiconductor, Transistor, High Electron Mobility, HEMT, indfeat, indpowerelec

CATEGORIZED AS

- **Nanotechnology**
  - Electronics
- **Semiconductors**
  - Design and Fabrication

RELATED CASES

2017-462-0

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,101,379	08/24/2021	2017-462

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- High-Quality N-Face GaN, InN, AlN by MOCVD
- Defect Reduction in GaN films using in-situ SiNx Nanomask
- 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
- Novel Current-Blocking Layer in High-Power Current Aperture Vertical Electron Transistors (CAVETs)
- Iii-N Transistor With Stepped Cap Layers
- III-N Based Material Structures and Circuit Modules Based on Strain Management

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