Lateral Growth Method for Defect Reduction of Semipolar Nitride Films
Tech ID: 21918 / UC Case 2005-672-0

BRIEF DESCRIPTION
A novel method for defect reduction via lateral growth of semipolar nitrides

BACKGROUND
As bulk GaN crystals are not widely available, current devices are grown on foreign substrates heteroepitaxially. The nature of heteroepitaxial growth leads to significant defect densities, most prominently in the form of threading dislocations. Researchers are continually trying to reduce defect density. In c-plane nitride growth, as well as other semiconductor materials systems, the threading dislocation defects predominantly propagate along the principal growth direction. As such, laterally growing polar and nonpolar nitrides tend to exhibit reduced defect densities.

DESCRIPTION
Researchers at the University of California, Santa Barbara have developed a novel method for defect reduction via lateral growth of semipolar nitrides. Lateral growth can be used to reduce defect density in semipolar nitride films by such growth techniques as LEO, SLEO, cantilever epitaxy, and nanomasking. The lateral growth can also be performed multiple times to further decrease the dislocation density.

ADVANTAGES
- Reduced defect density in semipolar nitride films
- Can be performed multiple times to further decrease dislocation density

APPLICATIONS
- Growth of semipolar nitride films

This technology is available for a non-exclusive license. See below for a selection of the patents and patent applications related to this invention. Please inquire for full patent portfolio status.

PATENT STATUS

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<th>Country</th>
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<td>United States Of America</td>
<td>Issued Patent</td>
<td>8,148,244</td>
<td>04/03/2012</td>
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ADDITIONAL TECHNOLOGIES BY THESE INVENTORS
- Enhanced Optical Polarization of Nitride LEDs by Increased Indium Incorporation
- Etching Technique for the Fabrication of Thin (Al, In, Ga)N Layers
- Vertical Cavity Surface-Emitting Lasers with Continuous Wave Operation
- III-Nitride-Based Devices Grown With Relaxed Active Region
- Low-Cost Zinc Oxide for High-Power-Output, GaN-Based LEDs (UC Case 2010-183)
- Defect Reduction in GaN films using in-situ SiNx Nanomask
- Enhanced Light Extraction LED with a Tunnel Junction Contact Wafer Bonded to a Conductive Oxide
- Highly Efficient Blue-Violet III-Nitride Semipolar Laser Diodes

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OTHER INFORMATION
KEYWORDS
nitride films, indssl, indbulk, cenIEE
CATEGORIZED AS
- Engineering
- Optics and Photonics
  - All Optics and Photonics
- Semiconductors
  - Design and Fabrication

RELATED CASES
2005-672-0