

Accession number:12620538

Title:Threading dislocation reduction in transit region of GaN terahertz Gunn diodes

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Source title:Applied Physics Letters

Abbreviated source title:Appl. Phys. Lett. (USA)

Volume:100

Issue:7

Publication date:13 Feb. 2012

Pages:072104 (4 pp.)

Language:English

ISSN:0003-6951

CODEN:APPLAB

Document type:Journal article (JA)

Publisher:American Institute of Physics

Country of publication:USA

Material Identity Number:AB34-2012-012

Abstract:An effect of the position of notch-doping layer in 1- μm GaN Gunn diode on threading dislocations (TDs) distribution is investigated by transmission electron microscopy. Compared with the top-notching-layer (TNL) structure, the bottom-notching-layer (BNL) structure can efficiently reduce the TDs density and improve the crystal quality in the transit region of GaN Gunn diode because it exhibits twice-transition of growth mode from atomic step flow to layer-by-layer nucleation and leads to a significant annihilation of TDs before penetrating into the transit region. X-ray diffraction and Raman spectroscopy reveal that the BNL structure has less compressive stress than the TNL structure.

Number of references:18

Inspec controlled terms:dislocations - gallium compounds - Gunn diodes - III-V semiconductors - nucleation - Raman spectra - transmission electron microscopy - wide band gap semiconductors - X-ray diffraction

Uncontrolled terms:compressive stress - Raman spectroscopy - X-ray diffraction - significant annihilation - layer-layer nucleation - atomic step flow - crystal quality - bottom-notching-layer structure - top-notching-layer structure - transmission electron microscopy - terahertz Gunn diodes - transit region - threading dislocation reduction - GaN

Inspec classification codes:B2560S Other field effect devices

Chemical indexing:GaN/sur Ga/sur N/sur GaN/bin Ga/bin N/bin

Treatment:Practical (PRA); Theoretical or Mathematical (THR)

Discipline:Electrical/Electronic engineering (B)

DOI:10.1063/1.3685468

Database:Inspec

IPC Code:H01L29/00Copyright 2012, The Institution of Engineering and Technology