

Title (en)  
SEMICONDUCTOR STRUCTURE WITH A SPACER LAYER

Title (de)  
HALBLEITERSTRUKTUR MIT EINER ABSTANDSSCHICHT

Title (fr)  
STRUCTURE SEMI-CONDUCTRICE AVEC COUCHE D'ESPACEMENT

Publication  
**EP 3335242 A4 20190410 (EN)**

Application  
**EP 16835909 A 20160811**

Priority

- US 201562203438 P 20150811
- US 201615094985 A 20160408
- US 2016046546 W 20160811

Abstract (en)  
[origin: WO2017027704A1] A multi-layer semiconductor structure is disclosed for use in III-Nitride semiconductor devices, including a channel layer, a band-offset layer having a wider bandgap than the channel layer, a spacer layer having a narrower bandgap than the band-offset layer, and a cap layer comprising at least two sublayers. Each sublayer is selectively etchable with respect to sublayers immediately below and above, each sublayer comprises a III-N material  $A_1xIn_yGa_zN$  in which  $0 \leq x \leq 1$ ,  $0 \leq y \leq 1$ , and  $0 \leq z \leq 1$ , at least one sublayer has a non-zero Ga content, and a sublayer immediately above the spacer layer has a wider bandgap than the spacer layer. Also described are methods for fabricating such semiconductor structures, with gate and/or ohmic recesses formed by selectively removing adjacent layers or sublayers. The performance of resulting devices is improved, while providing design flexibility to reduce production cost and circuit footprint.

IPC 8 full level  
**H01L 29/778** (2006.01); **H01L 21/336** (2006.01); **H01L 27/14** (2006.01); **H01L 29/205** (2006.01); **H01L 29/872** (2006.01); **H01L 29/15** (2006.01); **H01L 29/20** (2006.01); **H01L 29/417** (2006.01); **H01L 29/423** (2006.01)

CPC (source: EP)  
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Citation (search report)

- [XII] US 2008237605 A1 20081002 - MURATA TOMOHIRO [JP], et al
- [XI] US 2013256829 A1 20131003 - KIKKAWA TOSHIHIDE [JP]

Citation (examination)

- TETSU KACHI ET AL: "GaN power device and reliability for automotive applications", RELIABILITY PHYSICS SYMPOSIUM (IRPS), 2012 IEEE INTERNATIONAL, IEEE, 15 April 2012 (2012-04-15), pages 3D.1.1 - 3D.1.4, XP032204901, ISBN: 978-1-4577-1678-2, DOI: 10.1109/IRPS.2012.6241815
- See also references of WO 2017027704A1

Cited by  
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