Title (en)

FIELD EFFECT TRANSISTOR HAVING PERIODICALLY DOPED CHANNEL

Title (de)

FELDEFFEKTTRANSISTOR MIT PERIODISCH-DOTIERTEM KANAL

Title (fr)

TRANSISTOR A EFFET DE CHAMP AVEC CANAL PERIODIQUEMENT DOPE

Publication

EP 1464086 A2 20041006 (EN)

Application

EP 02720273 A 20020426

Priority

- GB 0201948 W 20020426
- RU 2001127264 A 20011009

Abstract (en)

[origin: WO03032398A2] A method of fabricating field-effect transistor having periodically doped channel comprising selecting a wavelength of wave-ordered nanostructure G<2>/ alpha <2> times smaller than the length of the transistor channel, G being the desired gain in transistor transconductance and working frequency due to periodical doping of the channel, alpha being the ratio of the wavelength to the distance between doped regions; forming a thin layer of screen silicon oxide on the surface of a transistor region of a first conductivity type; depositing a layer of amorphous silicon; sputtering the surface of the amorphous silicon by a flow of nitrogen molecular ions in vacuum so as to form the nanostructure, directing the ion incidence plane along the transistor channel, determining the ion energy and the ion incidence angle to the amorphous silicon surface on the basis of the wavelength of the nanostructure; transforming the nanostructure into the nanomask by reactive-ion plasma; implanting the doping ions so as to form in the channel region of the transistor shallow implants of the second conductivity type identical to that for transistor's source and drain regions and opposite to the first conductivity type; removing nanomask and the screen silicon oxide; forming gate dielectric material, a gate, source and drain regions completing the fabrication of the transistor.

IPC 1-7

H01L 29/78; H01L 29/10; H01L 21/336; H01L 21/266

IPC 8 full level

H01L 21/266 (2006.01); **H01L 21/335** (2006.01); **H01L 29/10** (2006.01); H01L 21/336 (2006.01)

CPC (source: EP)

H01L 21/0337 (2013.01); **H01L 21/266** (2013.01); **H01L 21/32139** (2013.01); **H01L 29/1045** (2013.01); H01L 29/66575 (2013.01)

Citation (search report)

See references of WO 03032398A2

Designated contracting state (EPC)

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR

DOCDB simple family (publication)

WO 03032398 A2 20030417; **WO 03032398 A3 20030703**; EP 1464086 A2 20041006; RU 2191444 C1 20021020

DOCDB simple family (application)

GB 0201948 W 20020426; EP 02720273 A 20020426; RU 2001127264 A 20011009