

Title (en)

QUASI-VERTICAL POWER SEMICONDUCTOR DEVICE ON A COMPOSITE SUBSTRATE

Title (de)

QUASI-VERTIKALES LEISTUNGSHALBLEITERBAUELEMENT AUF EINEM VERBINDUNGSSUBSTRAT

Title (fr)

DISPOSITIF SEMICONDUCTEUR DE PUISSANCE QUASI-VERTICAL SUR SUBSTRAT COMPOSITE

Publication

EP 1535346 A2 20050601 (FR)

Application

EP 03780259 A 20030901

Priority

- FR 0350045 W 20030901
- FR 0210883 A 20020903

Abstract (en)

[origin: FR2844099A1] The device is implemented in epitaxial semiconductor material in the form of a piled-up structure comprising a layer of semiconductor material (13) transferred to the first face of a support substrate (11) and joined to it by the intermediary of an insulator layer (12), and epitaxial layers (14,15) supported by the semiconductor layer. The electric connection contacts (16,17) of the device are provided on the upper epitaxial layer and on the second face of the support substrate. The electric link metallizations (19) are extended from electric contacts (18) on the lower epitaxial layer to the support substrate through the insulator layer thus linking the epitaxial layer to the other contact (17) through the support substrate which is sufficiently conducting. The support substrate (11) is made of an electrically conducting material, or of a semiconductor material from the group comprising SiC, GaN, AlN, Si, GaAs, ZnO and Ge. The support substrate is overdoped on the side of the interface with the insulator layer. The epitaxial material comprises layers (14,15) of different doping level. The epitaxial material is from the group comprising SiC, GaN, AlGaIn, InGaIn, and diamond. The electric connection contacts comprise at least one Schottky contact. The insulator layer is of a material from the group comprising silicon dioxide (SiO₂), silicon nitride (Si₃N₄), and diamond. The semiconductor layer (13) is of a material from the group comprising SiC, GaN, AlN, Si, ZnO, and diamond. A semiconductor circuit (claimed) is associated with at least one semiconductor power device (claimed), and with at least one semiconductor device which is not linked to the second face of the support substrate.

IPC 1-7

H01L 29/872

IPC 8 full level

H01L 29/47 (2006.01); **H01L 29/868** (2006.01); **H01L 29/872** (2006.01); **H01L 29/20** (2006.01); **H01L 29/24** (2006.01)

CPC (source: EP US)

H01L 29/868 (2013.01 - EP US); **H01L 29/872** (2013.01 - EP US); **H01L 29/1608** (2013.01 - EP US); **H01L 29/2003** (2013.01 - EP US)

Citation (search report)

See references of WO 2004027878A2

Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

DOCDB simple family (publication)

FR 2844099 A1 20040305; **FR 2844099 B1 20050902**; EP 1535346 A2 20050601; JP 2005537679 A 20051208; TW 200410312 A 20040616; US 2005258483 A1 20051124; WO 2004027878 A2 20040401; WO 2004027878 A3 20040506

DOCDB simple family (application)

FR 0210883 A 20020903; EP 03780259 A 20030901; FR 0350045 W 20030901; JP 2004537241 A 20030901; TW 92124197 A 20030902; US 52664105 A 20050302