

Title (en)
AVALANCHING SEMICONDUCTOR DEVICE HAVING AN EPITAXIALLY GROWN LAYER

Title (de)
LAWINENHALBLEITERVORRICHTUNG MIT EPITAKTISCH GEWACHSENEM SCHICHT

Title (fr)
DISPOSITIF A SEMI-CONDUCTEURS A AVALANCHE, COMPRENANT UNE COUCHE A CROISSANCE EPITAXIALE

Publication
EP 0913003 A4 19990825 (EN)

Application
EP 97933308 A 19970703

Priority
• US 9711768 W 19970703
• US 3534996 P 19960703

Abstract (en)
[origin: WO9800873A1] An avalanche diode device that has a first layer of semiconductor material (12) and a second layer of semiconductor material (18) positioned thereon so as to define an interface (14). The first layer of semiconductor material (12) is a substrate and the second layer (18) comprises an avalanche layer wherein a depletion region is generated at the interface. The second layer (18) is preferably deposited on the first layer (12) through chemical vapor deposition epitaxial growth techniques. When photons enter the avalanche layer, a minority charge carrier is produced and, when the device is reversed biased, an avalanche of charge carriers is produced in the avalanche layer. Since the avalanche layer is deposited using epitaxial growth techniques, the uniformity of the layer produces higher gain uniformity. Further, the avalanche layer can be configured using the epitaxial growth techniques to have a gain region of higher dopant concentration located adjacent the interface with a spectral absorption layer with a lower dopant concentration interposed between the gain region and the surface that receive the photons. Hence, a higher quantum efficiency can be produced in an avalanche photodiode having this configuration while still maintaining a high degree of gain uniformity and low noise characteristics.

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H01L 31/107

IPC 8 full level
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CPC (source: EP)
H01L 31/107 (2013.01)

Citation (search report)
• [Y] US 5057892 A 19911015 - IWANCZYK JAN S [US]
• [Y] US 3886579 A 19750527 - OHUCHI HIROBUMI, et al
• [X] PATENT ABSTRACTS OF JAPAN vol. 005, no. 133 (E - 071) 25 August 1981 (1981-08-25)
• [Y] SZE S M: "PHYSICS OF SEMICONDUCTOR DEVICES", 1981, JOHN WILEY & SONS, NEW YORK., XP002107219
• See references of WO 9800873A1

Cited by
US4711725A

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WO 9800873 A1 19980108; AU 3652597 A 19980121; CA 2259502 A1 19980108; EP 0913003 A1 19990506; EP 0913003 A4 19990825; JP 2001525117 A 20011204

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