Title (en)

TERAHERTZ RADIATING DEVICE BASED ON SEMICONDUCTOR COUPLED QUANTUM WELLS

Title (de)

TERAHERTZ-STRAHLUNGSEINRICHTUNG AUF DER BASIS VON HALBLEITERGEKOPPELTEN QUANTENMULDEN

Title (fr)

DISPOSITIF DE RAYONNEMENT TERAHERTZ BASE SUR DES PUITS QUANTIQUES COUPLES A DES SEMI-CONDUCTEURS

Publication

EP 1842242 A2 20071010 (EN)

Application

EP 05703116 A 20050120

Priority

IL 2005000073 W 20050120

Abstract (en)

[origin: WO2006077566A2] A semiconductor device and method of its fabrication are provided to enable the device operation in a THz spectral range. The device comprises a heterostructure including at least first and second semiconductor layers. The first and second layers are made of materials providing a quantum mechanical coupling between an electron quantum well (EQW) in the first layer and a hole quantum well (HQW) in the second layer, and providing an overlap between the valence band of the material of the second layer and the conduction band of the material of the first layer. A layout of the layers is selected so as to provide a predetermined dispersion of energy subbands in the conduction band of the first layer and the valence band of the second layer. An application of an external bias field across the first and second layers causes THz radiation originating from radiative transitions of non-equilibrium carriers between at least one of the following: neighboring energy subbands of the EQW, neighboring energy subbands of the HQW, and ground energy subbands of the EQW and HQW.

IPC 8 full level

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CPC (source: EP)

B82Y 20/00 (2013.01); **H01L 33/06** (2013.01); **H01S 1/02** (2013.01); **H01S 5/34** (2013.01); H01S 5/3419 (2013.01); H01S 5/3422 (2013.01); H01S 2302/02 (2013.01)

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