

Title (en)
MULTISPECTRAL DETECTOR MATRIX

Title (de)
MATRIX VON MULTISPEKTRALEN DETEKTOREN

Title (fr)
MATRICE DE DETECTEURS MULTISPECTRAUX

Publication
EP 1573821 A1 20050914 (FR)

Application
EP 03809998 A 20031217

Priority
• FR 0350186 W 20031217
• FR 0216178 A 20021219

Abstract (en)
[origin: FR2849273A1] The matrix structure of multispectral detectors (100) comprises several superposed layers of a semiconductor material (101,102,103) separated by thin layers of dielectric material (104,105) which are transparent for light to detect, and feedthroughs (131,132) and a conducting wall (151) electrically linked to conducting pads (121,122,123,153) corresponding to the conducting pads (21,22,23,53) of a read circuit (10). The superposition of layers of the semiconductor material is distributed in pixels, where each part of the layers corresponds to a pixel comprising a detection element which delivers the electric charges in response to the light received by the detection element. The front face receiving the light to detect is covered with a passivation layer (106), which is a thin dielectric layer. The rear face is that of hybridation with the read circuit (10) which utilizes the collected electric charges. The conducting feedthroughs (131,132) are lodged in wells, where each well is of a depth allowing to reach the corresponding detection element. The detection element is a semiconductor junction, in particular constituted of a doped zone (161,162,163) in that part of the semiconductor layer. The conducting wall (151) is obtained by filling a trench implemented in the superposition of the semiconductor layers to make an electric contact with all layers and to form a common electrode for all detection elements. The trenches are implemented according to a mesh where each cell contains several, for example 4, detection elements, or only one detection element. The conducting walls (151) are in electric contact with the layers of the semiconductor material by doped zones (141,142,152), or are locally insulated from the detection elements and the common electrode so to constitute capacitors for storing electric charges. The structure also comprises means for reflecting the light placed above conducting walls so to direct the light towards adjacent detection elements. The structure comprises the superposition of the layers of semiconductor materials of different nature. The structure comprises n layers of semiconductor material of thickness determined as a function of n wavelength ranges of the light spectrum.

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