Title: A non-pixel image reader for continuous image detection based on tandem heterostructures

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Source: Sensors and Actuators A-Physical
Volume: 115 **Issue:** 2-3 **Pages:** 191-195 **DOI:** 10.1016/j.sna.2004.01.030 **Published:** SEP 21 2004

Abstract: An optically addressed read-write sensor based on two stacked p-i-n heterojunctions is analyzed. The device is a two terminal image sensing structure. The charge packets are injected optically into the p-i-n writer and confined at the illuminated regions changing locally the electrical field profile across the p-i-n reader. An optical scanner is used for charge readout. The design allows a continuous readout without the need for pixel-level patterning.

The role of light pattern and scanner wavelengths on the readout parameters is analyzed. The optical-to-electrical transfer characteristics show high quantum efficiency, broad spectral response, and reciprocity between light and image signal. A numerical simulation supports the imaging process. A black and white image is acquired with a resolution around 20 mum showing the potentiality of these devices for imaging applications.

Language: English

Document Type: Article; Proceedings Paper

Conference Title: 17th European Conference on Solid-State Transducers (Eurosensors XVII)

Conference Date: SEP 21-24, 2003

Conference Location: Guimaraes, PORTUGAL

Conference Host: Univ Minho

Author Keywords: Tandem Structures; Heterojunction; Image Sensor; Electrical and Numerical Simulation

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Publisher: Elsevier Science SA

Publisher Address: PO BOX 564, 1001 Lausanne, SWITZERLAND

ISSN: 0924-4247

ISO Source Abbrev.: Sens. Actuator A-Phys.