

Title: Sensor element for a metal-insulator-semiconductor camera system (MISCam)

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Source: Sensors and Actuators A-Physical

Volume: 115 **Issue:** 2-3 **Pages:** 331-335 **DOI:** 10.1016/j.sna.2004.03.074 **Published:** SEP 21 2004

Abstract: We discuss the operation of a new type of optical sensor (MISCam) based on a metal-insulator-semiconductor (MIS) structure. The operation principle relies on light-induced changes of the band bending and barrier height at the interface between semiconductor and insulator. An image is obtained from the quenching of the ac signal in analogy to the principle of the laser-scanned photodiode (LSP). Lateral resolution depends on the semiconductor material chosen. We have characterised the MIS structures by C-V, I-V, and spectral response measurements testing different types of insulators like a-Si₃N₄, SiO₂, and AlN. The presence of slow interface charges allows for image memory. Colour sensors can be realised by controlling sign and magnitude of the electric fields in the base and the interface region. (C) 2004 Published by Elsevier B.V.

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: MIS Detector; Image Sensor; C-V Curve; Spectral Response

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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.