Title: Enhanced short wavelength response in laser-scanned-photodiode image sensor using an a-SiC : H/a-Si : H tandem structure

Author(s): Fantoni, A (Fantoni, A); Louro, P (Louro, P); Fernandes, M (Fernandes, M); Vieira, M (Vieira, M); Lavareda, G (Lavareda, G); De Carvalho, CN (De Carvalho, CN)

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Abstract: We report in this paper the recent advances we obtained in optimizing a color image sensor based on the laser-scanned-photodiode (LSP) technique. A novel device structure based on a a-SiC:H/a-Si:H pin/pin tandem structure has been tested for a proper color separation process that takes advantage on the different filtering properties due to the different light penetration depth at different wavelengths a-SM and a-SiC:H. While the green and the red images give, in comparison with previous tested structures, a weak response, this structure shows a very good recognition of blue color under reverse bias, leaving a good margin for future device optimization in order to achieve a complete and satisfactory RGB image mapping. Experimental results about the spectral collection efficiency are presented and discussed from the point of view of the color sensor applications. The physics behind the device functioning is explained by recurring to a numerical simulation of the internal electrical configuration of the device. (C) 2005 Elsevier B.V. All rights reserved.

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Reprint Address: Fantoni, A (reprint author), DEETC, ISEL, Rua Conselheiro Emídio Navarro, P-1949014 Lisbon, Portugal

E-mail Address: afantoni@deetc.isel.pt

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