Title: Direct Color Sensor, Optical Amplifier and Demux Device Integrated on a Single Monolithic SiC Photodetector

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Abstract: A pi'n/pin a-SiC:H voltage and optical bias controlled device is presented and its behavior as image and color sensor, optical amplifier and demux device is discussed. The design and the light source properties are correlated with the sensor output characteristics. Different readout techniques are used. When a low power monochromatic scanner readout the generated carriers the transducer recognizes a color pattern projected on it acting as a direct color and image sensor. Scan speeds up to 10(4) lines per second are achieved without degradation in the resolution. If the photocurrent generated by different monochromatic pulsed channels is readout directly, the information is demultiplexed. Results show that it is possible to decode the information from three simultaneous color channels without bit errors at bit rates per channel higher than 4000 bps. Finally, when triggered by light of appropriated wavelength, it can amplify or suppress the generated photocurrent working as an optical amplifier (C) 2009 Published by Elsevier Ltd.

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