

Title: SiC Multilayer Photonic Structures with Self Optical Bias Amplification

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Abstract: Characteristics of tunable wavelength pi'n/pin filters based on a-SiC:H multilayered stacked cells are studied both experimental and theoretically. Results show that the device combines the demultiplexing operation with the simultaneous photodetection and self amplification of the signal. An algorithm to decode the multiplex signal is established. A capacitive active band-pass filter model is presented and supported by an electrical simulation of the state variable filter circuit. Experimental and simulated results show that the device acts as a state variable filter. It combines the properties of active high-pass and low-pass filter sections into a capacitive active band-pass filter using a changing photo capacitance to control the power delivered to the load.

Author Keywords: A-SiC:H Pi'n/Pin Optical Filters; Self Amplification; Photodetection; Electrical Model; Optoelectronic Logic Programming; MUX/DEMUX Device

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