

Opto-Electronics Review, 2015, volume 23, issue 2, pp. 143-148

## **Different cap-barrier design for MOCVD grown HOT HgCdTe barrier detectors**

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DOI: <https://doi.org/10.1515/oere-2015-0017>

### Abstract:

The performance of HgCdTe barrier detectors with cut-off wavelengths up to 3.6  $\mu\text{m}$  fabricated using metalloorganic chemical vapour deposition operated at high temperatures is presented. The detectors' architecture consists of four layers: cap contact, wide bandgap barrier, absorber and bottom contact layer. The structures were fabricated both with n- and p-type absorbing layers. In the paper, different design of cap-barrier structural unit (n-B<sub>p'</sub>, n<sup>+</sup>-B<sub>p'</sub>, p<sup>+</sup>-B<sub>p</sub>) were analysed in terms of various electrical and optical properties of the detectors, such as dark current, current responsivity time constant and detectivity. The devices with a p-type cap contact exhibit very low dark current densities in the range of  $(2\div 3)\times 10^{-4}$  A/cm<sup>2</sup> at 230 K and the maximum photoresponse of about 2 A/W in wide range of reverse bias voltage. The time constant of measured devices with n-type cap contact and p-type absorbing drops below 1 ns with reverse bias while the detectivity is at the level of 1010 cm<sup>2</sup> · Hz<sup>1/2</sup>/W.