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State-of-the-Art MCT Photodiodes for Cutting-Edge Sensor Applications by AIM

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Abstract

For about 30 years AIM has been ranking among the leading global suppliers for high performance MCT infrared detectors with its portfolio spanning the photosensitivity cut-off range from the SWIR to the VLWIR and from 1st generation to 3rd generation FPA devices.

AIM presents its latest developments to meet the market demands for SWaP-C- and IR-detectors with additional functionalities such as multicolor detection. In this context, we will present our latest excellent results of 5.3 µm cut-off LPE-grown MWIR-MCT detectors with 1024x768 pixels and a 10 µm pixel pitch.

AIM's powerful low dark current LWIR and VLWIR p-on-n device technology on LPE-grown MCT has by now been extended to the MWIR spectral range, and a comparison of results from n-on-p and p-on-n MWIR-MCT planar photodiode arrays is given. Operating temperatures of 160 K and higher in conjunction with low defect density and excellent thermal sensitivity (NETD) are attained.

Using large GaAs substrates, AIM has been growing MBE-MCT multilayer stacks for cost-effective multicolor application sensing layers for several years. During the development, a design with 640x512 pixels and a 20 µm pitch was tested: Latest results on MWIR/MWIR diodes demonstrate high QE, very low color cross talk, and excellent NETD in conjunction with low defect densities.

MWIR single color MBE-MCT detectors grown on GaAs at AIM are now qualified and have reached a maturity meeting fully customers' requirements. MCT detectors based on MBE on GaAs are available and already delivered.

Keywords: FPA, MCT, SWaP, HOT, MULTICOLOR, MWIR