

Extended SWIR Imaging Sensors for Hyperspectral Imaging Applications

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ABSTRACT

AIM has developed SWIR modules including FPAs based on liquid phase epitaxy (LPE) grown MCT usable in a wide range of hyperspectral imaging applications. Silicon read-out integrated circuits (ROIC) provide various integration and readout modes including specific functions for spectral imaging applications.

An important advantage of MCT based detectors is the tunable band gap. The spectral sensitivity of MCT detectors can be engineered to cover the extended SWIR spectral region up to 2.5 μm without compromising in performance.

Currently, AIM is developing the technology to extend the spectral sensitivity of its SWIR modules also into the VIS. This has been successfully demonstrated for 384x288 24 μm pitch FPAs. The development of larger format arrays with optimized performance parameters is ongoing and results will be presented in this paper.

The FPAs are integrated into compact dewar cooler configurations using different types of coolers, like rotary coolers, AIM's long life split linear cooler MCC030 or extreme long life SF100 Pulse Tube cooler. The SWIR modules include command and control electronics (CCE) which allow easy interfacing using a digital standard interface.

The development status and performance results of AIM's latest MCT SWIR Modules suitable for hyperspectral systems and applications will be presented.

Keywords: MCT, SWIR, Extended SWIR, VIS/SWIR, Hyperspectral Imaging