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Extended SWIR imaging for targeting and reconnaissance

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ABSTRACT

In the recent years AIM has developed IR modules for imaging applications sensitive in the extended SWIR (eSWIR) spectral range with a cut-off wavelength of 2.5µm. The modules are based on AIM's state-of-the-art MCT FPA technology with a dedicated ROIC integrated in a low size, weight and power (SWaP) Dewar/Cooler configuration. The different modules are either designated to combine emissive and reflective imaging in one sensor by already detecting thermal radiation in the eSWIR band or to make use of laser illumination including gating capability. Further integration including a lens, image processing electronics and power supply was done resulting in sights for targeting and reconnaissance applications.

For targeting under low-light conditions a low SWaP MCT eSWIR module in a 640x512 format with 10µm pitch was developed. The module was integrated to a compact clip-on weapon sight for small arms providing medium range performance up to 1000m.

For reconnaissance applications a MCT based SWIR 2D APD array in a 640x512 15µm pitch format was developed providing gated viewing capability. The device was optimized to provide a higher gain for improvement of the signal to noise ratio (SNR). The module was integrated in a camera demonstrator including a 1.5µm laser illuminator for field trials to demonstrate long range identification.

The paper will present the latest performance results including field trials of MCT based eSWIR modules and sights for imaging applications.

Keywords: SWIR, eSWIR, MCT, FPA, APD, SWaP, Weapon Sight, Laser Gated Viewing