

Infrared Imagers State-Of-Art: Overview of Cooled and Uncooled InfraRed Image Sensors developments.

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Abstract:

The Infrared domain offers very attractive panel of information about the observed scene. Indeed the thermal radiation can add to the visible image very valuable information. After a brief reminder on the back physics driving the infrared domain, the author will review the existing applications. The main domains are defense and security, machine vision, thermography, science and spatial/astronomy.

The author will introduce the technologies mastered, from II-VI to III-V compounds, including μ bolometers. The main technology blocks will be described. Depending on the application needs, high to low end detectors can be offered to customers covering 0.7 μ m up to 15 μ m wavelength with both cooled and uncooled technologies.

An overview of state of the art products including competitive landscape will be presented. This will detail SWIR, MWIR and LWIR trade-offs between technologies and product requirements. A special focus on spatial applications will be presented.

At the end of the presentation, the author will summarize the main trends in the industry. For the cooled IR domain, the strong effort in development of High Operating Temperature systems will be described. Regarding the uncooled micro-bolometer domain, the large volume applications are changing the rules. Also, the author will open the door to the emerging applications like ultra-small UAV and Internet Of Things.

Finally the author will highlight the differences and commonality with the “visible” image sensor technology trends.