

Uncooled Focal Plane Array Producibility

PROBLEM / OBJECTIVE

High sensitivity, high-resolution (640x480) uncooled IR (UCIR) sensors are too expensive for the sensors to widely proliferate throughout Army systems. In addition, there is a very large mismatch between UCIR FPA production capacity and FCS, current and future force projected requirements (>12,000 packaged UCIR FPAs per year).

The purpose of the Uncooled Focal Plane Array Producibility Manufacturing Technology Objective was to improve producibility of the high resolution (640x480) Uncooled IR sensor technology in order to affordably field advanced Uncooled IR sensor technology to meet FCS requirements.

ACCOMPLISHMENTS / PAYOFF

Process Improvement: The Uncooled FPA Producibility program enabled an approximate 8X reduction in cost of the advanced Uncooled IR sensor, marked improvement in overall IR sensor performance, and an improvement in the production capacity to over 100 advanced Uncooled IR sensors/week per source. Process improvements include:

- Successfully accomplished a high vacuum sealing process for packaging.
- A Dry release process for the MEMS structure was developed and is showing good results on test lots.
- Successful development of a new resist strip process
- Installation and testing of a high-resolution photolithography
- Successful testing of Vacuum probe for radiometric testing on several FPAs.
- Initiation of automated wafer inspection.

Implementation and Technology Transfer: The program has transitioned to the Thermal Weapons Sight, Driver Vision Enhancer, and Stryker Remote Weapon Station, Uncooled B-Kit, and the Navy LOGIR missile Programs.



Implementation resulted in performance advantages and cost savings as a direct result of the Uncooled FPA Producibility program.

Expected Benefits and Warfighter Impact:

The Uncooled FPA Producibility program accomplished the main goals and metrics:

- (1) In FY04, FPA yield was greater than 25%, package yield greater than 80%, and cost less than \$9 K/unit (MRL 6).
- (2) In FY05, FPA yield was greater than 30%, package yield greater than 90%, and cost less than \$5 K/ unit (MRL 7).
- (3) In FY06, FPA yield was greater than 50%, package yield greater than 98%, and cost less than \$2 K/ unit (MRL 8).

The program directly impacted the Warfighter. There are improved thermal weapons sights and driver vision enhancers being delivering to our Warfighters now, at less cost.

TIME LINE / MILESTONE

Start Date	October 2003
End Date	September 2006

FUNDING

U.S. Army ManTech	\$15.376M
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PARTICIPANTS

Raytheon Vision Systems, Goleta, CA
DRS IR Technology, Dallas, TX
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