

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 for 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 Soldier requirements.



Reduced System Size, Weight, Power, and Cost while Maintaining Range Performance

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.
- 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 program.

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

Expected Benefits and Warfighter Impact:

The program directly impacted the Warfighter. As a result of this program, improved thermal weapons sights and driver vision enhancers were delivered to our Warfighters. These sensors provide high resolution technology that enhanced capability to Soldiers in the areas of operation, reduced the system size, weight, and power of the system while maintain excellent range performance.

FPA yield was greater than 50%, package yield greater than 98%, and cost less than \$2 K/ unit (MRL 8). Further, the reduced power requirements significantly reduced the warfighter logistics support costs for batteries.

TIME LINE / MILESTONE

| | |
|------------|----------------|
| Start Date | October 2003 |
| End Date | September 2006 |

FUNDING

| | |
|-------------------|-----------|
| U.S. Army ManTech | \$15.376M |
|-------------------|-----------|

PARTICIPANTS

Raytheon Vision Systems, Goleta, CA
DRS IR Technology, Dallas, TX
BAE Systems, Lexington, MA