



Defense-Wide Manufacturing Science & Technology (DMS&T) Program



Electro Optical Distributed Aperture System (EODAS) Readout Integrated Circuit (ROIC) Producibility

PROBLEM / OBJECTIVE

The F-35 Electro-Optical Distributed Aperture System (EODAS) uses multiple large format sensors to provide high resolution infrared imagery for aircraft situational awareness and missile threat warning. Yield of the EODAS ROIC is low, contributing to high cost and delivery risk. In order to achieve EODAS sensor cost objectives, the cost of the focal plane array (FPA) must be reduced.

APPROACH / BENEFITS

Objectives

- Improve quality and yield of very large infrared (IR) FPA ROICs, which will lower cost and time to deployment for EODAS and other critical sensors.

Approach

- Survey industry to determine capable foundry using high yield and Zero Defect manufacturing processes
- Perform cryogenic characterization of new process devices and develop necessary device models
- Design ROIC for new process to include hardening
- Port the current EODAS ROIC design over to the new foundry process
- Hybridize FPAs and test



EODAS

Expected Benefits and Warfighter Impact

- New ROIC design will contribute to cost cutting initiatives to achieve program budget, due to increased and more consistent yields. It is estimated that improvements will result in 25% cost savings per FPA.
- If 130 nm cryogenic models are developed as part of this program, this could have a potential benefit to other government platforms using cryogenically cooled custom integrated circuits.
- Manufacturing ROIC on a state-of-the-art manufacturing process will reduce risk of obsolescence. The current EODAS ROIC is currently manufactured using some of the manufacturer's oldest 500nm equipment. Moving production to a newer toolset using 130nm processes reduces risk associated with fabricating the EODAS ROIC on older equipment.

POINT OF CONTACT

Government Point of Contact: Arlynn Hall, AFRL/RXME
937-904-4364
arlynn.hall@us.af.mil

88ABW-2013-4576

<https://www.dodmantech.com/>