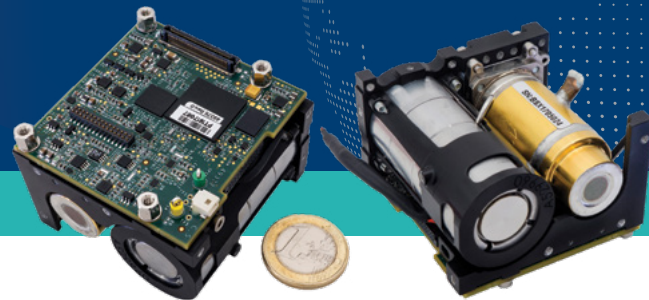




# Sparrow - Blackbird 640

Low SWaP, Low Cost MWIR Video Core



Defense Applications



## General Description

The Sparrow is a low cost and low SWaP MWIR camera core designed for the demanding requirements of wide distribution market applications such as handheld thermal systems and miniature payloads for drones or long range thermal weapon system for snipers.

The Sparrow uses a state-of-the-art HOT Blackbird FPA which is integrated into a compact and novel Dewar and cooler architecture. These elements are assembled in a compact manner that also includes low power electronics. The Sparrow electronics has multiple capabilities including FPA control, cooler driver & control, and a complete set of video processing features.

This 640x512 FPA is based on SCD's mature and field proven XBn (HOT) technology operating at 150K with 10 $\mu$ m pixel pitch. It includes a Digital readout integrated circuit (ROIC) implemented in advanced CMOS process. Combining these two elements yields outstanding image quality.

The 10 $\mu$ m pitch FPA overall size is about 55% smaller than common VGA solutions based on 15 $\mu$ m pitch pixel which enable the user to reduce the size & weight of the system optics. The combination of this miniature FPA with its high operating temperature enables optimization of the cooler and Dewar for low SWaP applications. Another important advantage of the Sparrow is its long life time that is based upon linear engine technology combined with the HOT FPA technology.

## Main Features

- FPA: 640x512 at 10 $\mu$ m pitch and running at 150K
- Weight: 300gr (0.66 lb.)
- Total power consumption: typically 4 WDC at proxy mode
- Time to image: typically 4 minutes
- Frame rate: up to 180Hz (raw data); 60 Hz (full video processing)
- All in one electronics: FPA drive & control, Cooler drive & control, Image processing
- Simple electrical interface - Industry Standard Camera link
- Full Module MTBF > 18,000 hours (GM, 35°C)

## Video processing capabilities:

- Non Uniformity Correction (NUC)
- Bad-Pixel Replacement (BPR)
- Image Enhancement and Dynamic Range Compression (DRC)
- Noise Reduction
- Pseudo Color
- Embedded User Interface
- Overlay Graphics
- Digital Zoom

## Applications

- HandHeld Thermal Imager cameras
- Drone & Tactical UAV IR cameras
- Perimeter security
- Armored vehicle weapon stations
- Mini and micro tactical payloads
- Snipers long range TWS





## Typical Performance

Parameter	Value
Detector Format	640 x 512, 10µm pixel
Sensing Material	XBn operating at 150K
Integration Modes	ITR, IWR
Integration Capacitors	0.9Me- , 2.0Me-
Operation Modes	Full Image Processing Mode (Video Engine) Raw Digital output (Proxy Mode)
Video Engine Main Processing Algorithms	NUC, BPR, Image Enhancement and DRC, Digital Zoom, Pseudo color, Graphics overlay
Maximum Frame Rate	60 Hz with Image Processing 180 Hz without Image Processing
Digital Signal Resolution	13 bit
NETD (2Me- capacitor)	28mK @ 50% well fill capacity
Residual Non Uniformity	< 0.06% STD/DR at 20-80% well fill capacity
Operability	> 99.5%
IDCA Optical Parameters	Standard F/3.6 Spectral Range: 3.6÷4.2 µm
Cooler Type	Micro Cooler, Split Linear
Module MTBF	> 18,000 hours (GM @ 35°C)
Module Total Power Consumption @ 23°C	Typical 4W not including Image Processing Additional 1WDC for full video processing
Image Ready @ 23°C	Typical 4 minutes
Module Dimensions	58 x 62 x 42 mm (2.28" x 2.44" x 1.65")
Module Weight	300 gm. (0.66 lb.)

Specifications are subject to changes without further notice