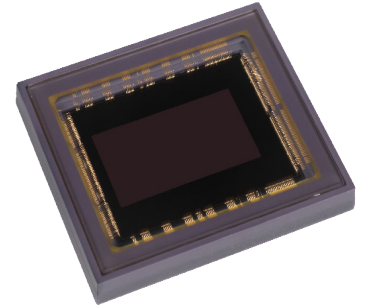


HWK4123

Where every photon counts

4/3" | 9.4MP | BSI | sCMOS 3.1 Technology



HWK4123 is a groundbreaking, ultra-low noise/ultra-low light imaging sensor

Incorporating sCMOS 3.1 technology, HWK4123 is a 4K image sensor capable of photon counting at 0.25e- RMS read noise. Combining the market leading low read noise with high quantum efficiency BSI processing enables <0.001 Lux (starlight) imaging.

The HWK4123 delivers the highest end performance for a variety of applications in science, space, night vision, industrial, and other markets.

An innovative BSI process

Our custom process delivers a broad spectrum Near-Infrared Quantum Efficiency (NIR QE) out to 1100nm to sense nightglow for improved night vision in monochrome and color versions. Coupled with a very low dark current, our proven dual-gain amplifier architecture results in 16 bits per pixel to encompass the full dynamic range. Low-gain and high-gain signal paths provide analog to digital conversions at multiple gain factors on a pixel-by-pixel basis. This process optimizes both high intrascene dynamic range and low-light performance.

The result is an advanced feature set with native high dynamic range, long exposures modes, and photon counting capability for the most demanding imaging applications.

Key features and benefits

- 0.25e- RMS read noise enables photon counting
- 9.4MP (4096 x 2300) optimizes the resolution for low light imaging
- 87 dB range shows more detail in high contrast scenarios
- Enhanced NIR QE process improves low light imaging out to 1100nm
- Extremely low dark current enables long exposure mode
- Global shutter reduces image blur at high frame rates

Applications

- Science
- Space Domain
- Machine Vision
- Night Vision
- Astronomy
- Surveillance

Ideal for imaging in extreme low-light conditions

Specifications

Sensor

Optical format	4/3"
Configurations	Monochrome or Bayer RGB
Active array	4096 x 2300 (9.4MP)
Active area	18.9 mm x 10.6 mm
Active diagonal	21.6 mm
Frame rates	120 fps @ full frame rate 1000 fps @ 283 rows (ROI)
ADC resolution	12 bits @ ≤ 60 fps 11 bits @ 120 fps
Programmable gain	LG: 1x HG: 8x, 16x, 32x

Pixel

Pixel size	4.6µm x 4.6 µm
Shutter types	Rolling w/ global reset; Global
Peak Quantum Efficiency	91%
Read noise floor	0.25e- RMS @ 5 fps
Read noise at max frame rate	0.50e- RMS @ 120 fps
Dynamic range	87 dB
Dark current	0.1e-sec @ 0°C
Non-linearity	<1%

Interface

Temperature sensor	Analog & Digital Outputs
Output data interface @ 1.2 Gbps	10 sub-LVDS @ 60 fps 20 sub-LVDS @ 120 fps
Data type	11 or 12 bit RAW 16 bit LG/HG merged
Control interface	SPI 20 MHz

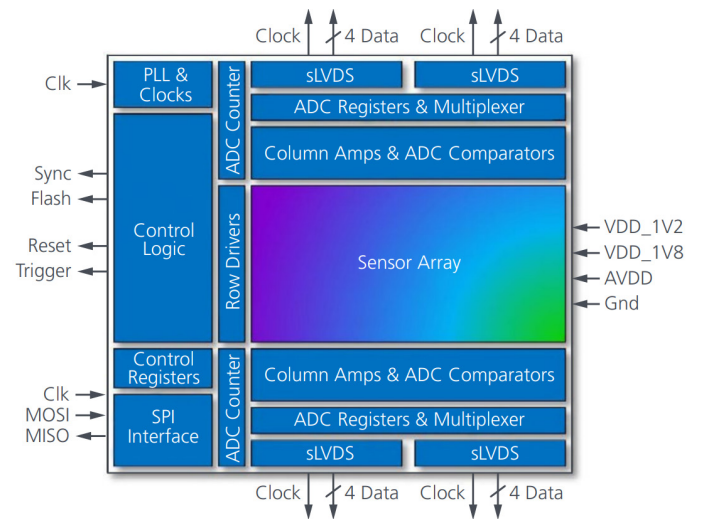
Operating

Power	1.8W @ 120 fps
Operating temp	-30°C to + 70°C
Power supply	3.3V, 2.5V, 1.8V, 1.2V

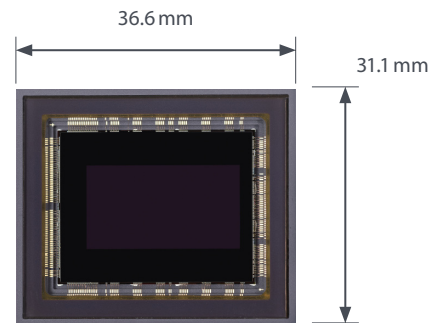
Packaging

Package	256 Pin CLGA
Coverglass	AR coated sealed window; temporary window

Block Diagram



Dimensions



For more information contact:
Fairchild Imaging, Inc.
1841 Zanker Rd., Ste. 50
San Jose, CA 95112 USA

T: 1-408-433-2500
E: sales@fcimg.com

Disclaimer and copyright

This document gives only a general description of the product(s) and service(s) and, except where expressly provided otherwise, shall not form any part of any contract. From time to time, changes may be made in the products or the conditions of supply.

Fairchild Imaging is a registered trademark of Fairchild Imaging, Inc.
Hamamatsu is a registered trademark of Hamamatsu Photonics K.K.