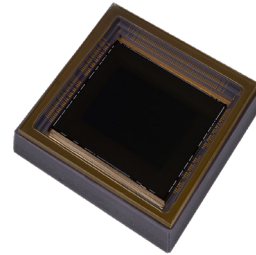


HWK1411

1" 1.6MP BSI sCMOS 3.0 with large
8 μ m pixel ultra low-light sensor



The HWK1411 sCMOS 3.0 BSI sensor defines the next horizon in professional imaging.

The HWK1411 utilizes an 8.0 μ m pixel, resulting in an ultra low-light capable sensor with market leading 0.5e-Root Mean Square (RMS) read noise. Combining the large photon collection area, and exceptionally low read noise with high quantum efficiency BSI processing enables <0.0001 Lux (overcast starlight) imaging capability. The HWK1411 delivers the performance required to transfer from daytime to nighttime.

The ultra low-light capable HWK1411 is available in monochrome and color versions, and employs new BSI sCMOS 3.0 pixel engineering to realize extremely low noise, boost Quantum Efficiency (QE), and reduce dark current. An innovative Backside Illuminated (BSI) process enhancement delivers a broad-spectrum Near-Infrared Quantum Efficiency (NIR-QE) out to 1100nm to enhance nightglow sensitivity. Low dark current enables lower dark signal noise and maintains high image quality under extreme temperature conditions.

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 that are merged on-chip on a pixel by pixel basis. The process optimizes both dynamic range and low light noise. The process optimizes both dynamic range and low light noise resulting in a high-native dynamic range which can be further extended utilizing the HWK1411's multiple exposure HDR operating modes. The low-power feature makes this sensor ideal for mobile battery powered applications

Key features and benefits

- 1.6MP (1440 x 1100) ideal for small form factor portable applications
- 8 μ m pixel for photon gathering capabilities
- 0.5 e-RMS read noise enables imaging in darker scenarios
- Enhanced NIR QE leverages the existing night-glow for improved low-light imaging
- Extremely low dark current enables longer exposure times
- Low power ideal for portable operation
- 120 fps frame rate creates no motion blur

Applications

- Soldier-worn systems
- Unmanned vehicles
- Targeting
- Surveillance

Ideal for imaging in extreme lighting conditions

Specifications

Sensor

Optical format	1"
Resolution	1.6Mp (1440 x 1100)
Configurations	RGB and Monochrome
Active area	11.5 mm X 8.8 mm
Frame rate	120 fps
ADC resolution	11 bits
Programmable gain	LG: 1x HG: 8x, 16x, 32x

Pixel

Pixel size	8.0µm x 8.0µm
Shutter types	Rolling Shutter
Read noise	0.5 e- RMS @ 120 fps
Dynamic range	82 dB
Quantum efficiency (mono)	80%
Dark Current	2.3 e-/sec @ 20°C

Features

Internal ISP	Fixed pattern noise correction HG/LG merging, 2x2 binning Companding Black level correction AE statistics engine Windowing Defective pixel correction Multiple exposure HDR
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Interface

Output data	4-lane MIPI CSI-2 @ 1.5 Gbps/lane
Data type	16 bit LG/HG merged 12 or 8 bit companded
Control interface	SPI 20 MHz

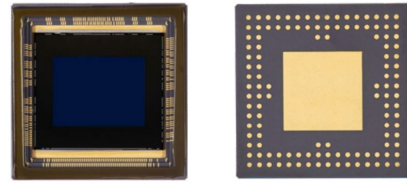
Weight

Sensor	3g
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Operating

Power	<750mW @ 120 fps
Operating temperature	-40°C to +85°C
Power supply	5.0V, 3.3V, 2.5V, 1.8V

Dimensions



Standard CLGA Package
22.6mm x 22.6 mm



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