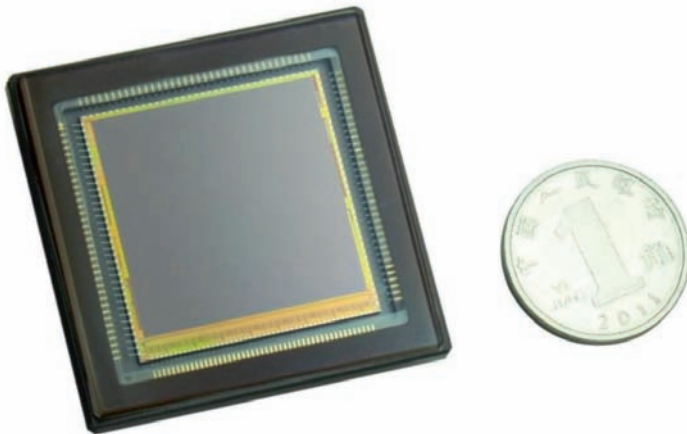


# Sci-CMOS 400

## CMOS Image Sensor for Scientific Applications

Preliminary Short Form Datasheet



Dark noise:  $1.47 e^-$   
 Sensitivity:  $2.12 \times 10^8 e^- / ((W / m^2) \cdot s)$   
 Dynamic range: 96 dB  
 STD mode and HDR mode

### Sensor descriptions:

The Sci-CMOS 400 is a 4 Megapixels CMOS image sensor with  $11 \mu m$  patented pinned photodiode pixels and electronic rolling shutter. Designed for scientific and high-end surveillance applications, Sci-CMOS 400 features low readout noise of 1.47 electrons, dynamic range of 96 dB and sensitivity of  $2.12 \times 10^8 e^- / ((W/m^2) \cdot s)$ .

Sci-CMOS 400 can be either operated in standard mode (STD) with 70 dB intra-scene dynamic range, or in high dynamic range mode (HDR) with 96 dB intra-scene dynamic range. Sci-CMOS 400 is capable of running up to 48 fps in STD mode, or 24 fps in HDR mode, and higher frame rates can be achieved in row-windowing mode.

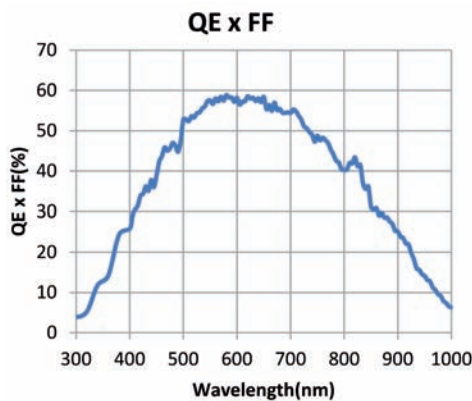
Mounted in a 115-pin ceramic PGA package, the power consumption of less than 600 mW can be easily dissipated. In addition, Sci-CMOS 400 has a dark current of less than  $32 e^-/s/pix$  at  $20^\circ C$ , and  $0.79 e^-/s/pix$  at minus  $20^\circ C$ , making it an ideal solution for the most demanding bio-imaging applications with long exposure time.

### Sensor features:

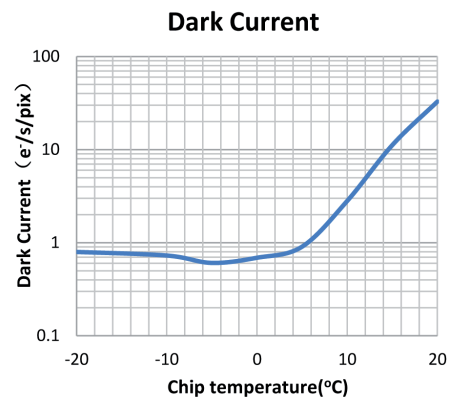
- Pixel Resolution: 2048 (H) x 2048 (V)
- $11 \mu m$  patented pinned photodiode pixel
- Optical and electrical black pixel rows
- Electronic rolling shutter
- Sensitivity:  $2.12 \times 10^8 e^- / ((W/m^2) \cdot s)$  @ 600 nm
- Dark noise:  $1.47 e^-$
- Dynamic range:
  - STD mode: 70 dB (intra-scene)
  - HDR mode: 96 dB (intra-scene)
- Dark current:  $32 e^-/s/pix$  @  $20^\circ C$
- 48 fps in STD mode
- 24 fps in HDR mode
- Row-based ROI windowing capability with enhanced frame rate
- PRNU: < 1 %
- FPN: < 0.1 %
- On-chip temperature sensor
- On-chip SPI control and on-chip PLL
- Power consumption < 600 mW

<b>Sensor Specifications:</b>			
Photon-sensitive area	22.5 mm (H) x 22.5 mm (V)	SNR Max	> 50 dB
Pixel size	11 μm x 11 m	Dark noise	1.47 e <sup>-</sup>
Resolution	2048 x 2048	Dark current	< 32 e <sup>-</sup> /s/pix @ 20 °C
Shutter type	Electronic rolling shutter	Dynamic range (STD mode)	> 70 dB (intra-scene)
ADC	12bit	Dynamic range (HDR mode)	> 96 dB (intra-scene)
Main clock rate	20 MHz ~ 30 MHz	Sensitivity	30 V / lux·s
Max frame rate	48 fps	Full well charge	91 ke <sup>-</sup>
Data rate	2.4 Gbit/s @ 25 MHz	FPN	< 0.1 %
Supply voltage	3.3 V / 1.8 V	PRNU	<1% rms
Operating temperature	-55 °C ~ +80 °C	QExFF (no μlens)	58 % @ 600 nm
Max power	< 600 mW	Package	115-pin PGA

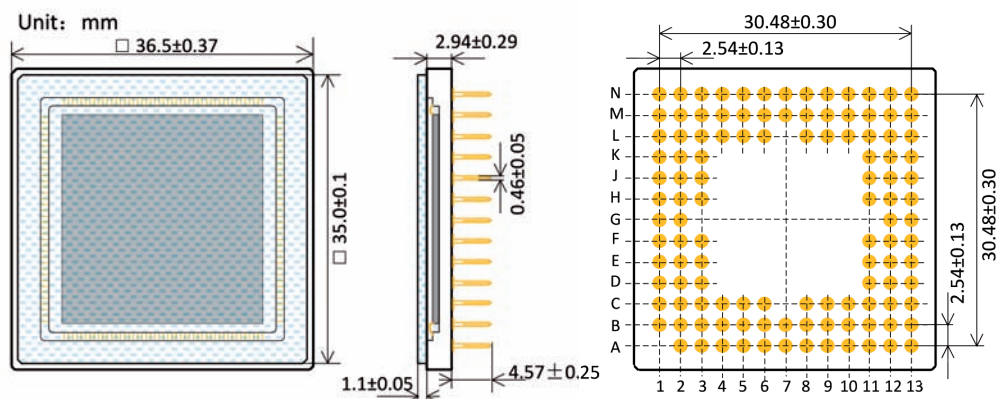
**QExFF:**



**Dark Current:**



**Package:**



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