

KLT-IRSW-OS02C10 V1.0

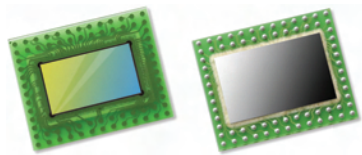
OmniVision OS02C10 with IR Switch MIPI Interface Fixed Focus 2MP M12 Camera Module



Camera Module No.	KLT-IRSW-OS02C10 V1.0	
Image Sensor	OS02C10	IR SWITCH
EFL	1.07 mm	Input Voltage: 3.3V ~ 5.5V
F.NO	2.0	IR: 645nm +/- 15nm
Pixel	1920 x 1080	AR: 700nm ~ 1000 nm
View Angle	210°(D) 210°(H) 210°(V)	Operation (IR Day Time)
Lens Type	1/2.8 inch	Red Line: Negative
Lens Dimensions	24.80 x 16.00 x 15.66 mm	Black Line: Positive
Module Size	57.07 x 30.00 mm	Operation (AR Night Time)
Module Type	Fixed Focus	Red Line: Positive
Interface	MIPI	Black Line: Negative

Mating Connector Part No. FH12-24S-0.5SH

Mating Connector On Main Board. Sold Separately.



OS02C10 2-megapixel product brief



Image Sensor Combines Ultra Low Light and Nyxel™ NIR Technologies for Industry's Best Nighttime Camera Performance



available in
a lead-free
package

OmniVision's OS02C10 is a 2.9-micron, 2-megapixel image sensor with breakthrough ultra-low-light (ULL) technology. Combining ULL with OmniVision's industry-leading Nyxel™ near-infrared (NIR) technology, the OS02C10 works equally well in all lighting conditions. It can detect incident light in both visible and NIR wavelengths and produce precise color and monochrome images for security applications such as remote surveillance cameras with AI for accurate facial recognition.

Nyxel NIR technology infuses the OS02C10 with exceptional quantum efficiency (QE) of 60% at 850 nm and 40% at 940 nm, which is 2x to 4x better than competing devices. This enables the use of lower-power IR illumination in total darkness, resulting in an estimated 3x reduction in system-level power consumption. Additionally, 940 nm NIR lighting cannot be detected by the human eye in dark indoor settings, while 850 nm light is ideal for outdoor security cameras. The OS02C10's ability to capture crisp, clear images using undetectable 940 nm NIR light means that indoor security cameras will not disturb sleeping occupants, and can be easily concealed from intruders.

The amount of NIR light that a sensor requires to capture high-quality images can be quantified with a new metric called NIR SNR1, which takes into account the QE, pixel size and read noise. The OS02C10 achieves an SNR1_{850nm} of 23nW/cm² and an SNR1_{940nm} of 31nW/cm², which means designers can reduce IR illumination to consume 2x to 4x less power compared to the competitors' sensors, for the same environment and over the same image-detection range.

The OS02C10 has a superior low-noise design, achieving an SNR1 of 0.16 lux while producing high definition 1080p images. OmniVision's proprietary dual-conversion-gain technology allows this sensor to achieve the industry's best ULL performance, while the 3-frame staggered shutter minimizes motion artifacts and enables a high dynamic range (HDR) of 120 dB. Additionally, these technologies are easily upgradable to 2K and 4K resolution as security systems begin their transition to higher-quality displays.

Find out more at www.ovt.com.



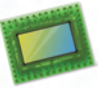
Applications

- Security Camera
- High Resolution Consumer Camera
- Action Camera

Product Features

- QE enhancement in NIR range
- support for image size:
 - 1920 x 1080
 - VGA
 - QVGA, and any cropped size
- high dynamic range
- high sensitivity
- programmable conversion gain
- image sensor processor functions:
 - defective pixel cancellation
 - automatic black level correction, etc.
- pixel data: 12b RAW RGB
- SCCB for register programming
- programmable GPIOs
- high speed serial data transfer with MIPI CSI-2 or LVDS
- external frame synchronization capability
- embedded temperature sensor
- one time programmable (OTP) memory

OS02C10



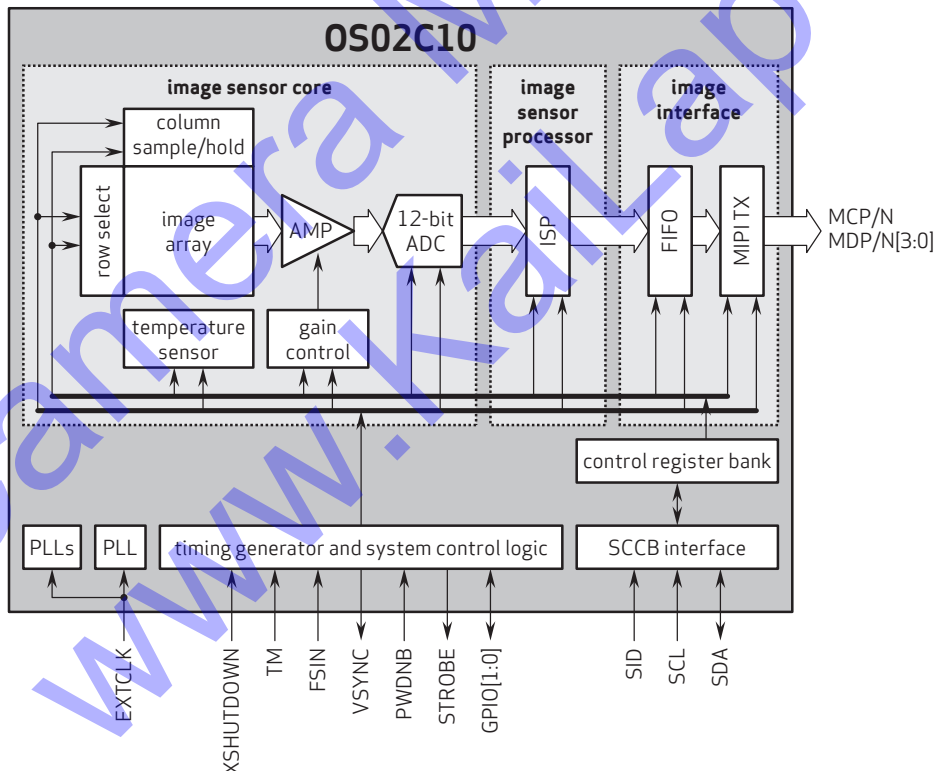
Ordering Information

- OS02C10-J70A-Z (color, lead-free) 70-pin fan-out package

Product Specifications

- active array size: 1920 x 1080
- power supply:
 - analog: 2.8V
 - digital: 1.1V
 - I/O pins: 1.8V
- temperature range:
 - operating: -30°C to +85°C junction temperature
- output interfaces: up to 4-lane MIPI CSI-2 or LVDS
- input clock frequency: 6 - 36 MHz
- lens size: 1/2.8"
- lens chief ray angle: 9° linear
- SCCB speed: up to 1 MHz
- scan mode: progressive
- shutter: rolling shutter
- output formats: linear output, dual exposure HDR (long and short), 3-exposure HDR (long, short, and very short), conversion gain programmable in each channel
- maximum image transfer rate:
 - 40X3 fps @ 1080p in 10-bit
 - 30X3 fps @ 1080p in 12-bit
- sensitivity: 32,000 e⁻/Lux-sec (green pixel response at 530 nm illumination)
- dynamic range: >120 dB 3-exposure staggered HDR
- pixel size: 2.9 μm x 2.9 μm
- image area: 5614.4 μm x 3178.4 μm
- package dimensions:
 - fan-out: 8903 μm x 7100 μm

Functional Block Diagram



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