



# OH02A1S

## 1080p product brief



### Medical RGB-IR Image Sensor Reduces Endoscope Size, Cost, Power and Heat by Half

OMNIVISION's OH02A1S is the world's first RGB-IR medical image sensor, providing simultaneous white-light RGB captures and infrared monochrome captures in a single CMOS sensor for cancer diagnosis and treatment. While endoscopic precancer and cancer detection procedures are performed using IR light, surgeons also need RGB light to confirm any abnormalities detected using infrared. Previously, this could only be accomplished by integrating two independent imager sensors, which resulted in endoscopes with a larger size, higher cost and higher power consumption, thereby excessively heating the tip of the endoscope.

Built on OMNIVISION's PureCel® pixel architecture, the OH02A1S offers 4x4 binning for the highest image quality, high quantum efficiency for excellent low-light performance, and a high dynamic range for clarity in scenes with widely contrasting bright and dark areas. The sensor can provide 1080p (1920 x 1080) resolution at 60 frames per second (fps) or 720p (1280 x 720) at 90 fps, via a 2-lane MIPI serial output. The OH02A1S also integrates 2 kilobits of one-time

programmable memory on-chip. It consumes just 90 milliwatts at full power, generating less heat for greater patient comfort.

With the OH02A1S, both IR and RGB images can now be captured using a single chip, allowing the surgeon to switch between high quality RGB and IR in real time, or to display both images simultaneously on one (overlay) or two (side-by-side) monitors. Additionally, the smaller size and reduced heat allow the endoscope to reach much farther into the body than was previously possible with larger-outer-diameter, two-imager designs. Alternatively, designers can use the extra space to add more or larger illumination (fiber or LED), or a larger working channel for endoscopic tools.

The OH02A1S image sensor is available today in an RW package and the chip-scale package will be available based on project demand.

Find out more at [www.ovt.com](http://www.ovt.com).



- OH02A1S-GA5A (RGB-Ir, chip probing, 150 µm backgrinding, reconstructed wafer with good die)

## Applications

- medical endoscopes
- dental equipment
- veterinarian endoscopes
- industrial endoscopes

## Product Features

- 1.4 µm x 1.4 µm pixel
- standard serial SCCB interface
- optical size of 1/6"
- up to 2-lane MIPI serial output interface (supports maximum speed up to 1000 Mbps/lane)
- programmable controls for:
  - frame rate
  - mirror and flip
  - cropping
  - windowing
- embedded 2 kilobits of one-time programmable (OTP) memory for customer use
- supports output formats: 10-bit RGB-Ir RAW
- add staggered HDR raw data output
- supports images sizes:
  - 1080p (1920 x 1080)
  - 720p (1280 x 720)
- interleave row high dynamic range (iHDR) output
- programmable I/O drive capability

## Technical Specifications

- active array size:** 1920 x 1080
- temperature range:**
  - operating: -30°C to +85°C junction temperature
  - stable image: 0°C to +60°C junction temperature
- maximum image transfer rate:**
  - 1080p: 60 fps
  - 720p: 90 fps
- power supply:**
  - core: 1.2V
  - analog: 2.8V
  - I/O: 1.8V
- lens size:** 1/6"
- lens chief ray angle:** 33° non-linear
- scan mode:** progressive
- power requirements:**
  - active: 90 mW
  - standby: 210 µA
  - XSHUTDN: 0.6 µA
- pixel size:** 1.4 µm x 1.4 µm
- image area:** 2728.8 µm x 1549.8 µm
- output format:** 10-bit RGB-Ir RAW
- die dimensions:**
  - COB: 3825 µm x 2889 µm
  - RW: 3875 µm x 2939 µm
- lens size:** 1/6"

## Functional Block Diagram

