



# SNAPSHOT RGB+NIR MULTI-SPECTRAL IMAGE SENSOR

Imec's RGB-NIR multispectral platform demonstrates for the very first time the possibility to integrate together standard RGB organic color filters, NIR-cut filter, NIR narrow band-pass filters and on-chip microlenses technology, down to small pixels as small as 5 $\mu$ m today. First image sensor prototypes are now available, packaged in a ready-to-use CMV2000 image sensor standard format for easy integration and early evaluation into final applications

## CMOS BASED SPECTRAL FILTERING TECHNOLOGY FROM INDUSTRIAL TO HIGH VOLUME APPLICATIONS

Leveraging CMOS semiconductor factories, equipments and process technology, imec design and manufacture at wafer-level interference based optical filters that are deposited and patterned directly on top of CMOS image sensor pixel arrays. This unique infrastructure provides very clean (class I – particle free) optical filter integration with unprecedented size and cost reduction, with potential for high-volume manufacturing

The integration of per-pixel patternable narrow-band NIR imaging filters together with NIR-cut filter for true color rendering based on standard RGB organic color filter and microlenses array technology is a major integration breakthrough. It is today recognized as a key enabling technology for next generation human-machine 3D imaging and medical diagnosis. But also in automotive and security surveillance applications where various NIR lighting concepts (LED or laser based) are being explored to improve the detection or tracking of useful signals, on purpose not visible to the human eye.

## KEY BENEFITS

- **Color + Narrow band NIR imaging** integrated into one single chip for compact, low cost and integrated optical design solutions
- **Tunable NIR band-pass filter design** to match filter band (location, FWHM) with your own application requirements, for e.g. with one particular laser or LED wavelength of illumination)

# RGB+NIR MULTISPECTRAL SENSOR & CAMERA SPECIFICATIONS

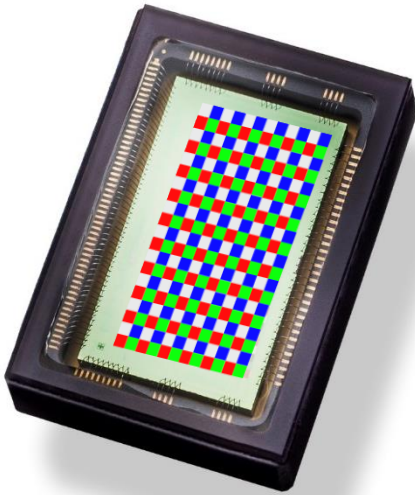


Fig.1 RGB-NIR multi-spectral imager 2x2 mosaic layout

Acquisition mode	Snapshot 2x2 mosaic pattern
Wavelength range	RGB+NIR channels
Number of spectral bands	4 channels
Bandwidth per band (FWHM)	See QE plot
Imager type	CMOS imager, CMOSIS CMV2000 based
Imager resolution	2.2 Mpixels total
Frame rate	Up to 170 fps
Pixel pitch	5.5 $\mu$ m
Bit depth	10 bit
Camera dimensions	26.4 x 26.4 x 21.6 mm
Camera weight	27g without fore-optics

Table.1 RGB+NIR sensor & camera performance

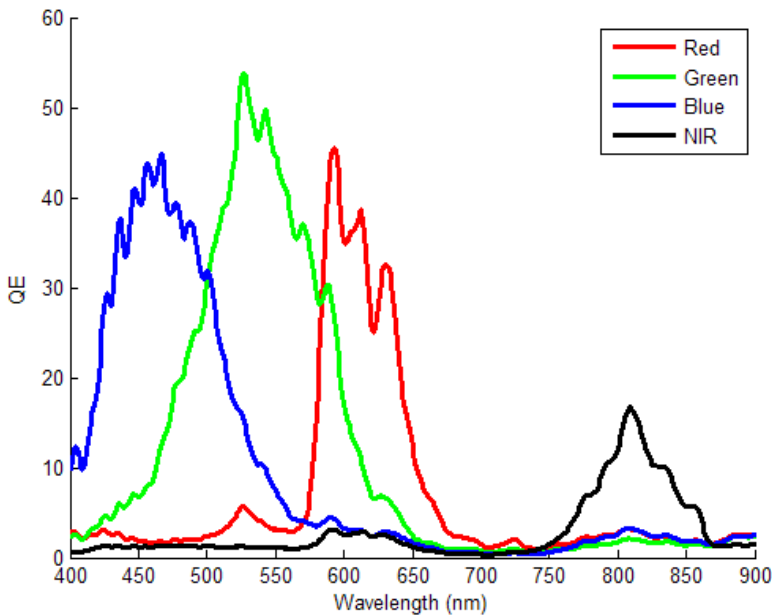


Fig.1 Measured QE responses of RGB+NIR spectral channels (with microlenses array post-processed on top of each filter)

## KEY APPLICATIONS

- Medical imaging using ICG fluorescence
- Human-machine interface for 3D gaming & virtual reality tracking
- Automotive
- Security surveillance
- Industrial inspection
- Food sorting

### MORE INFORMATION

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