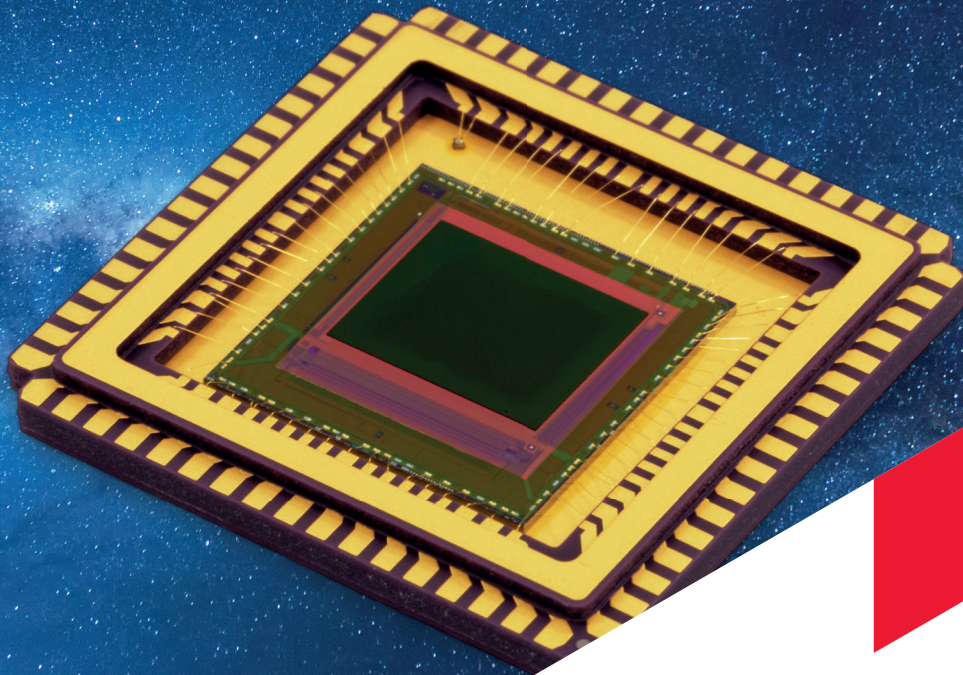


# SAPHIRA

ELECTRONICS DIVISION

## AVALANCHE PHOTODIODE ARRAY



The Saphira detector is designed for high speed infrared applications and is the result of a three year research and development programme alongside the European Southern Observatory on sensors for astronomical instruments. It delivers world leading photon sensitivity of  $<1$  photon rms with Fowler sampling and high speed non-destructive readout ( $>10K$  frame/s).

Saphira is an HgCdTe avalanche photodiode (APD) array incorporating a full custom ROIC for applications in the  $0.8$  to  $2.5\mu m$  range. A key aspect of the array is the ability to perform multiple non-destructive readouts which can allow Fowler sampling or “down the slope” sampling to significantly reduce the noise and increase the sensitivity.

The architecture allows multiple, independently resettable windows and a selectable number of parallel outputs up to 32.

Applications include wavefront sensors, fringe trackers, spectroscopy, and imaging in any photon starved scenario.

### MAIN FEATURES

- › Flexible integration and readout modes
- › Multiple independently resettable windows
- › Selectable number of outputs up to 32
- › Variable avalanche gain
- › Voltage clamp function to minimise persistence
- › Frame rate up to  $100K$  frames per second with windowing
- › Wavelength tuned to application
- › Windowing function to 1 pixel

### KEY BENEFITS

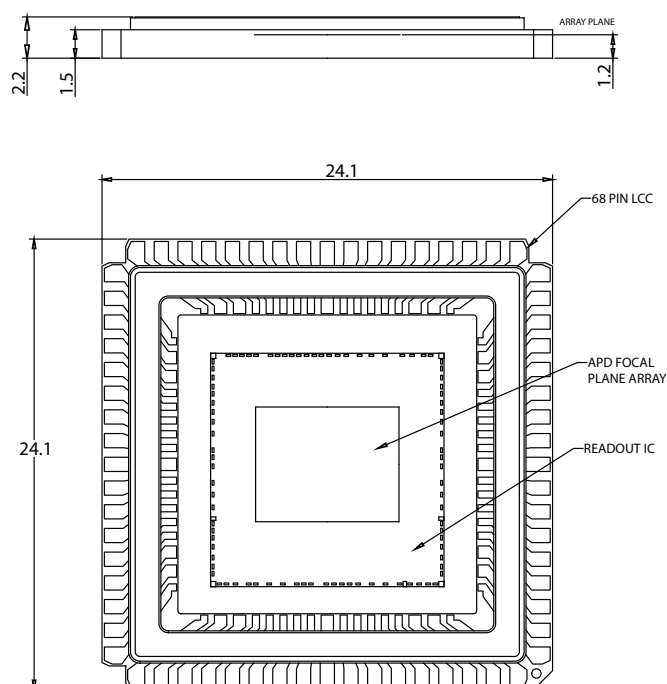
- › Combination of high sensitivity and high frame rate





## PACKAGING OPTIONS

- › Currently offered in a 68 pin LCC
- › Please contact us to discuss packaging options



## TECHNICAL SPECIFICATIONS

### FORMAT

- › Array: 320 x 256 pixels
- › Pixel Pitch: 24μm
- › Active Area: 7.68 x 6.14

### TYPICAL PERFORMANCE

- › Avalanche gain range: Up to 80
- › Median Sensitivity: 1 photon RMS (at gain of 80)
- › Pixel Operability: >99%
- › Power Consumption: 30mW

### OPERATING PARAMETERS

- › Modes: Snapshot or rolling
- › Configuration Control: Single serial interface
- › Output Voltage Range: From 2.0V to 1.0V
- › Charge Capacity:  $2 \times 10^5$  electrons
- › Number of Outputs: 4, 8, 16 or 32
- › Array Operating Temperature: 30K to 150K

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