



## 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  $2.5\mu\text{m}$  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 x 10 <sup>5</sup> electrons
Number of Outputs	4, 8, 16 or 32
Array Operating Temperature	30K to 150K

