

# A High Resolution, High-speed CMOS Image Sensor Family for Laser Triangulation Applications

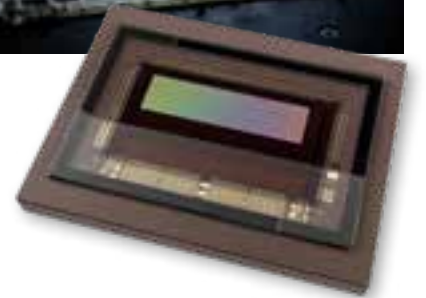


## FEATURES

- » Flash 4K: 4.4 million pixels (4,096 x 1,080)  
Flash 2K: 2.2 million pixels (2,048 x 1,080)
- » 6µm CMOS global shutter pixel with micro-lens
- » Flash 4K: 1,800fps (Full resolution @8 bits)  
Flash 2K: 1,500fps (Full resolution @8 bits)
- » LVDS digital output
- » SPI controls
- » Control input pins: trigger, reset  
Output pin: exposition in progress
- » PGA ceramic package
- » Operating temperature [-10° to 80°C]
- » Max power consumption:  
Flash 4K: 3.5W  
Flash 2K: 2.2W

## EMBEDDED FUNCTIONS

- » Region of Interest [X,Y]: multiple ROIs defined separately by columns and by rows
- » Binning: x2
- » High Dynamic Range (HDR) for imaging both highly reflective and dark areas
- » Concurrent exposure readout in linear exposure mode
- » Analog gain control: 1x, 2x, 4x
- » Offset control: on-chip, software configurable
- » Trigger modes: single edge, PWC (Pulse Width Control)
- » Vertical flipping



## APPLICATIONS

- » Measuring length, width, height, tilt or volume of any surface
- » Measuring the coating thickness of printed circuits boards
- » Measuring shapes and profiles
- » Detect worn or broken parts, roughness, aging, patching, humps, corrugation and waves
- » Inspection in motion

Flash 4K and Flash 2K are CMOS digital image sensors optimized for 3D laser triangulation applications which require high-speed and high-resolution. With 4,096 x 1,080 and 2,048 x 1,080 high-performance pinned photodiodes respectively, they both include global shutter pixels with 6µm pitch, which allows exposure during read-out (concurrent operation). The sensors can be configured for either linear light-to-digital response (achieving up to 50dB of dynamic range) or piece wise linear light-to-digital response (achieving a dynamic range over 100dB).

These new 3D sensors incorporate a sophisticated ultra-high speed column parallel readout channel with 8 or 10-bit accuracy, and include 64 (resp. 32) LVDS high-speed data ports that transfer 8 and 10-bit images at a speed of up to 960 (resp. 800) Mbps each.

Multiple derivatives of the sensors are available so that you can achieve the optimal fit for your requirements. Please contact **Teledyne e2v** for further information.

## SENSOR CHARACTERISTICS AND PERFORMANCES

	FLASH 4K	FLASH 2K
Resolution – pixels	4,096 (H) x 1,080 (V)	2,048 (H) x 1,080 (V)
Pixel size – square	6µm	
Max frame rate	1,800 (Full Resolution @8 bits)	1,500 (Resolution @8 bits)
Bit depth	8	
Readout noise – e-	< 27	
Qsat – e-	> 9,300	
Dynamic range – dB	> 50 (Linear integration) – Up to 100 (HDR multi-slope mode)	
SNRmax – dB	40	
Q.E. – % @550nm	60	
Interface	64 LVDS Data Ports + 4 @480.75MHz	32 LVDS Data Ports + 4 @400MHz
Package type and size	380-pin µPGA – 49x37mm	228-pin µPGA – 27x27mm
Power supplies	3,3V Analog & 1,8V Digital	

## NUMBER OF ROWS

	1,024	512	256	128	64	32	16	8
Frame rate Flash 4K – fps	1,786	3,488	6,661	12,217	20,957	32,626	45,214	56,022
Frame rate Flash 2K – fps	1,489	2,910	5,562	10,219	17,577	27,464	38,211	47,505

**Teledyne e2v** will release these sensors in Q4 2019. Samples are now available for Flash 4K and samples for Flash 2K will be available in July.

For more information, please contact us.