TELEDYNE

FLASH CMOS SENSOR FAMILY
3D Laser Triangulation Sensors

VisionSystems
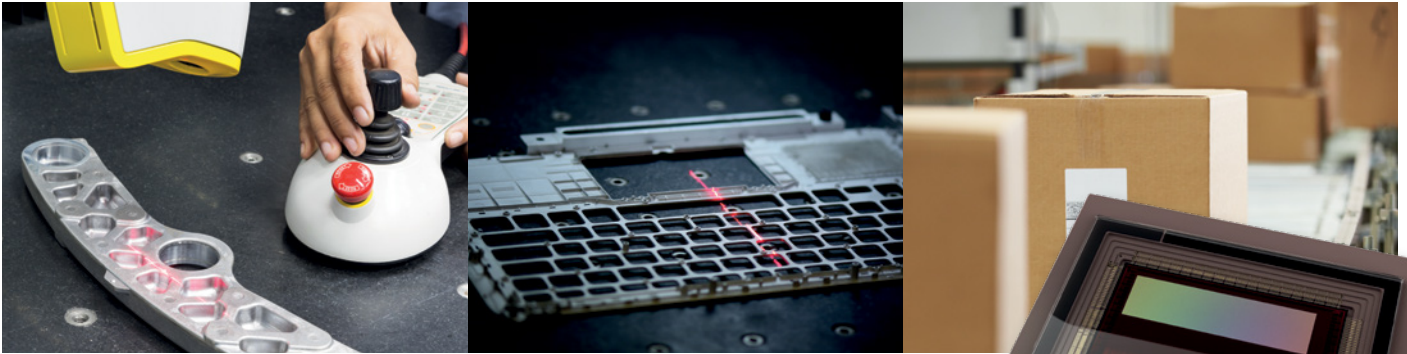2021 **Innovators Awards**
SILVER HONOREE

THE FLASH FAMILY, SPECIFICALLY TAILORED FOR 3D LASER TRIANGULATION

The Flash Family is the first family of CMOS sensors specifically tailored for 3D Laser Triangulation applications, allowing you to have high-resolution sensors with the highest speeds. Flash 2K and Flash 4K are compatible with standard optics and have a high throughput over power consumption ratio. Because of the large library of features embedded on-chip (including a powerful single frame HDR), they perfectly meet the challenges of the application.

SENSOR FEATURES

High-resolution in a rectangular format	**Very high frame rate and throughput**
2,048 × 1,080 & 4,096 × 1,080	1,500 fps & 1,800 fps at 1,024 rows
A reduced silicon size for lower sensor and system costs	Delivering outstanding sampling resolution and speed

HDR feature embedded on-chip	**Feature-rich sensors**
>53 dB in linear, up to 100 dB in multi-slope mode	ROI, binning, vertical flipping, hot changes etc.
Allowing the measurement of all kinds of surfaces	Perfectly meeting application challenges

CUSTOMER BENEFITS

The first family of sensors specifically tailored for 3D Laser Triangulation

• 2k and 4k horizontal resolution with 1,500 and 1,800 fps, to match the demands of current applications (and opening doors to new ones), that require outstanding spatial resolution with a high profiling rate

• Features only the required number of lines, making a less expensive sensor and system and saving on silicon for a reduced footprint and easier integration

A large library of derivatives are available	**Outstanding local support**
To fit with your requirements and to differentiate, to meet your specific application	Sales and technical support are available in your region to help you design your system

Sensor Characteristics

	FLASH 4K	FLASH 2K
Resolution – pixels	4,096 (H) × 1,080 (V)	2,048 (H) × 1,080 (V)
Pixel size – square	6 µm	
Max frame rate – fps	1,786 (1,024 rows, 8 bits)	1,489 (1,024 rows, 8 bits)
Bit depth	8-10	
Dark noise – e-	22	25
Qsat – e-	> 10,000	> 11,000
Dynamic range – dB	>53 (Linear integration) - Up to 100 (HDR multi-slope mode)	
SNRmax – dB	40	
FFxQE – % @550 nm	47	53
Interface	64 LVDS Data Ports @ 480.75 MHz + 12*	32 LVDS Data Ports @ 400 MHz + 4*
Package type and size	380-pin µPGA – 49 × 37 mm	228-pin µPGA – 27 × 27 mm
Power supplies	3.3V Analog & 1.8V Digital	
Optics	APS-Like at full frame 4/3" with a 3400 column-wise ROI	C-Mount
Max power consumption – W	3.1	1.4

*64/32 LVDS high-speed ports for data + 12/4 LVDS for black columns, clock recovery and synchronization.

EMBEDDED FEATURES

- Region of Interest [X,Y]: multiple ROIs defined separately by columns and by rows
- Binning: ×2 independently controlled for rows and columns
- Single-capture with the well adjustment technique and High Dynamic Range (HDR) for imaging both highly reflective and dark areas
- Concurrent exposure and readout in linear integration mode
- Analog gain control: 1×, 2×, 4×
- Offset control: on-chip, software configurable
- Trigger modes: single edge, pulse width control
- Vertical flipping

WIDE LIBRARY OF DERIVATIVES AVAILABLE

- Soft: higher full-well capacity, additional operating modes trading-off speed, spatial resolution and power consumption, etc.
- Hard: custom color-filter array, micro-lens arrangement, etc.

To achieve even more differentiation and optimal fit for your application, more derivatives are available on request. Please contact our sales team!

An Evaluation Kit to assess the performance of the Flash sensors and a Reference Design to improve your time-to-market are also available.

APPLICATIONS

- Inspection, detection, identification and guidance
- 3D inspection
- Inspection in motion
- High-speed inspection
- Slow motion imaging
- And more

MAX FRAME RATE ACCORDING TO THE NUMBER OF ROWS

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

ORDER CODE – FLASH 4K

EV3S4M0B-CLVFL40-T

ORDER CODE – FLASH 2K

EV3S2M0B-CLVFL20-T