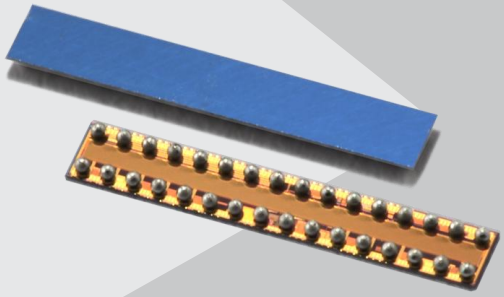
excelitas®

LA Series



Backside Illuminated CMOS/CCD Linear Image Sensors

Excelitas Line Sensors are the most versatile photo detectors in sensing technology. From rotary encoders, OCT scanners and triangulation sensors to edge detectors, spectrometers, accelerometers, inclinometers, linear encoders, surface scanners, and mapping systems – the universal chips enable a vast range of high-precision optical applications.

The LA-Series sets a new benchmark in miniaturization and performance. With its ultra-compact design, it is the smallest line sensor in its class worldwide – delivering outstanding sensitivity, speed, and precision for the most demanding optical measurement systems.

Designed for both industrial and portable platforms, the LA-Series combines high signal integrity, broad spectral responsiveness, and ultra-fast readout to ensure accurate, stable measurements even under dynamic or low-light conditions. Flexible acquisition modes, built-in thermal monitoring, and simple digital integration enable reliable, repeatable performance while reducing system complexity across precision metrology, scanning, spectroscopy, and wearable sensing applications.

YOUR BENEFITS

- High Spatial Resolution and Measurement Accuracy
- Broad Spectral Sensitivity for versatile optical designs
- Ultra-fast Line Rates for Dynamic and Real-Time Measurements
- Flexible Acquisition for static and dynamic use cases
- Excellent Signal Integrity and low uncertainty
- Simple and low-power system integration
- Improved Image quality through on-chip noise reduction

SPECIFICATIONS

- Pixel Size: 7.5 µm x 120 µm
- Very high QE from 350 nm to 1100 nm
- Up to 257,000 lines per second
- Single or multi frame acquisition
- Very high SNR of 70 dB
- Built-in temperature sensor
- Very small 8.1 x 1.3 x 0.23 mm
- Standard I2C interface
- On-chip CDS

All specifications refer to an ambient temperature of TA = 25 °C, unless otherwise specified.

Table 1: Key Parameters

Parameter	Symbol	Min	Typ.	Max	Unit
Operating Voltage	V_{OP}	2.70	3.00	5.00	V
Current Consumtion[1]	I_{OP}		6.0	9.0	mA
Spectral Range	$\Delta\lambda$	350		1100	nm
Pixel Pitch	W_{PIX}		7.5		µm
Pixel height	H_{PIX}		120		µm
Number of frame stores	N_{FS}		4		
Conversion Gain	CG	3	5	8	µV/e^-
Full-Well Capacity[2]	FW		400		ke^-
Output Voltage Swing	V_{Out}			2	V
Read Noise[3]	N_{READ_S}		500	700	µV
Image Lag	I_{LAG}			0.2	%
Peak Responsivity	λ_{PEAK}		750		nm
Responsivity	$R_{850\,nm}$		0.6		A/W
Package size	l		8.080		mm
	w		1.324		
	D		0.230		
Read clock frequency	f_{READ}	0.1		54	MHz

Note 1: Low power mode.
Note 2: FW corresponds to 2V swing at the output differential mode
Note 3: Single-ended mode

Table 2: Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Power Supply Voltage	V_{DD}	-0.3 ... + 5.0	V
Voltage to any Pin		-0.3 ... +0.3	V
Relative Humidity	RH	0 ... 95 non condensing	%
Storage and Operating Temperature	T	-40 ... +85	°C

Note 1: Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device.

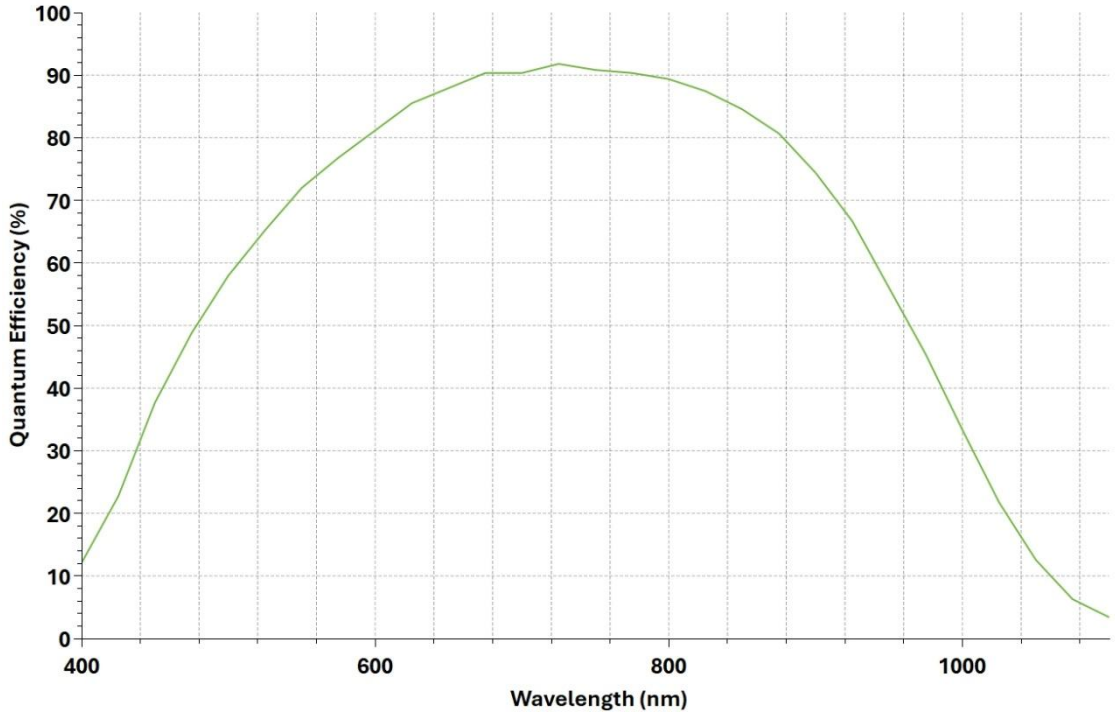
Note 2: Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Table 3: Ordering Information

Part Number	LA-1024p7.5	LA-512p15	LA-256p30	LA-256p15	LA-128p30	Units
Number of pixels	1024	512	256	256	128	
Pixel pitch	7.5	15	30	15	30	µm
Array length	7.68	7.68	7.68	3.84	3.84	mm
Output mode	Differential / single ended	Differential	Differential / single ended	Differential	Differential / single ended	
Frame rate	44,000	86,000	155,000	155,000	257,000	fps
Irradiance for FW	155	80	40	80	40	mW / (mm^2 * ns)
Sensitivity	71	142	284	142	284	V / (Lux*s)

Note 1: The various parts are based on the same chip but with different configurations. The version LA-1024p7.5 can be configured to operate like all the other parts.

FIG. 1: TYPICAL QUANTUM EFFICIENCY



RoHS compliance

This series of Line Imagers is designed and built to be fully compliant with the European Union Directive on restrictions on the use of certain hazardous substances in electrical and electronic equipment.

Warranty

A standard 12-month warranty following shipment applies

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For a complete listing of our global offices, visit **www.excelitas.com/locations**

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