


HAMAMATSU PHOTONICS – Madrid Aerospace Cluster

March 27th, 2017



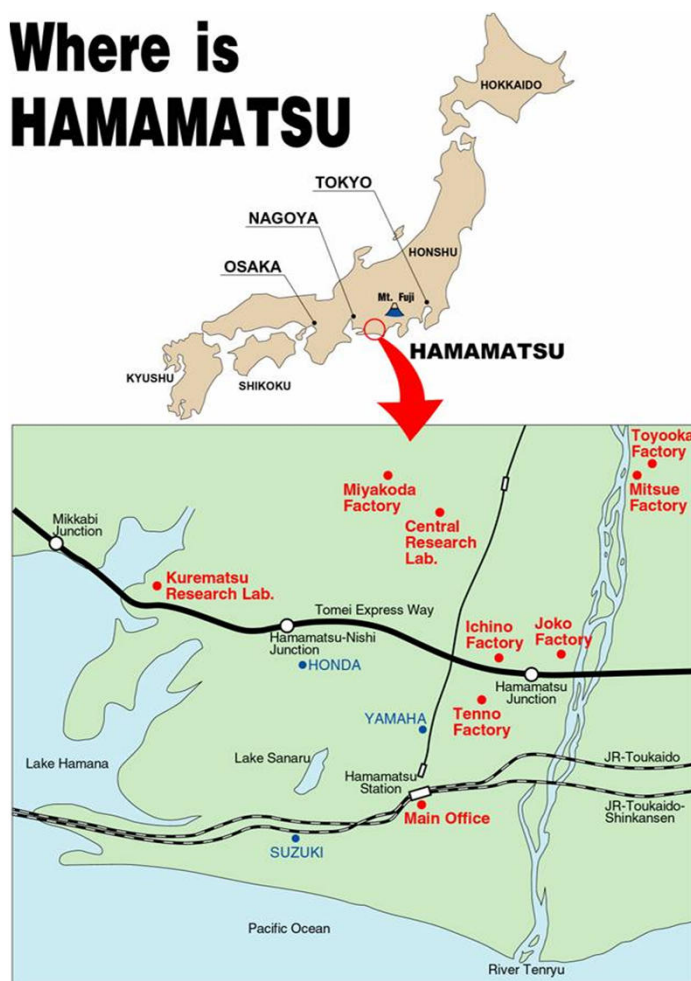
Hamamatsu Photonics Spain

Jordi Sobrino

jsobrino@hamamatsu.es

Corporate Data

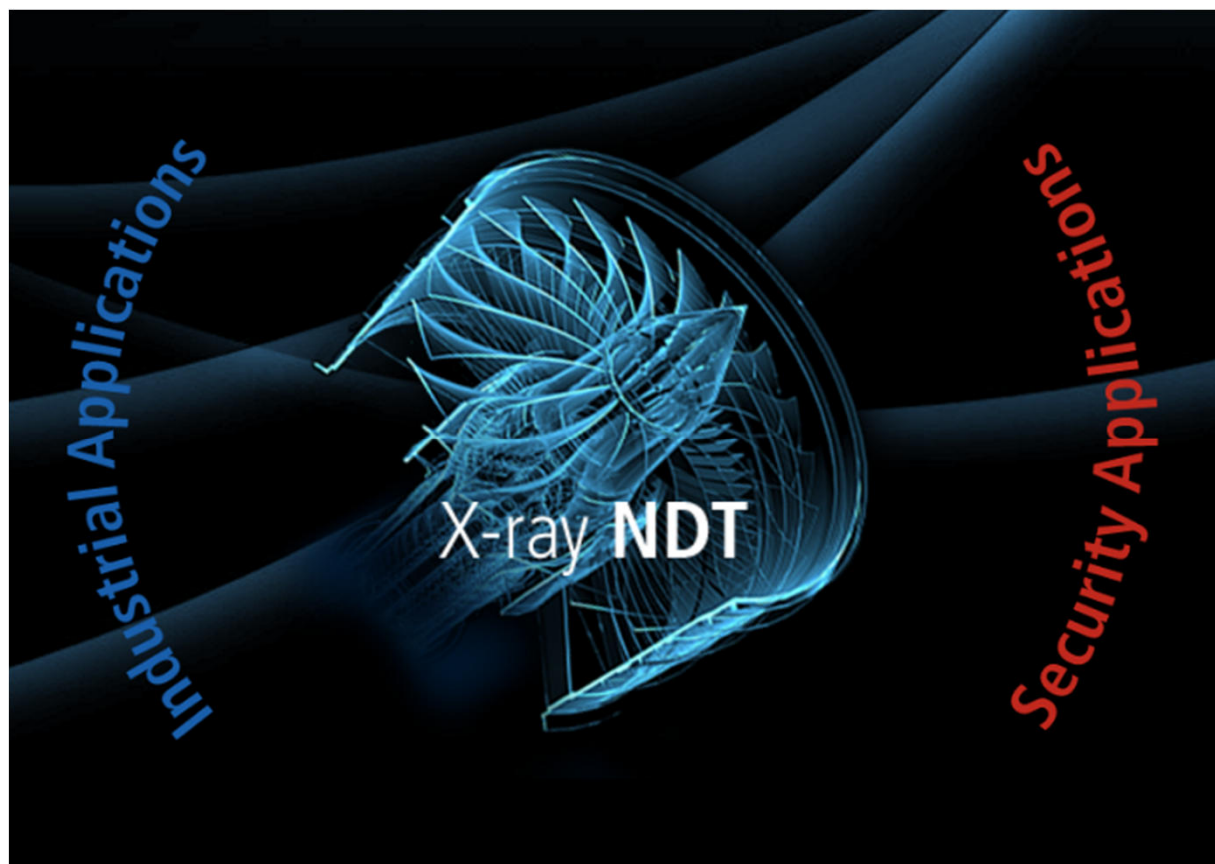
Where is HAMAMATSU



As of end of September 2016

- Established: September 29, 1953
- Stock listing: Tokyo Stock Exchange
(1st Section, ID number: 6965)
- Capital : 35 Billion YEN
- Number of employees : > 4000


Non-Destructive Testing




MICROFOCUS X-ray Source: Blade Inspection

SEALED TYPE


90 kV L9421-02




100 kV L10101, L10321



110 kV L9631




130 kV L9181-02




OPEN TYPE


110 kV L9931



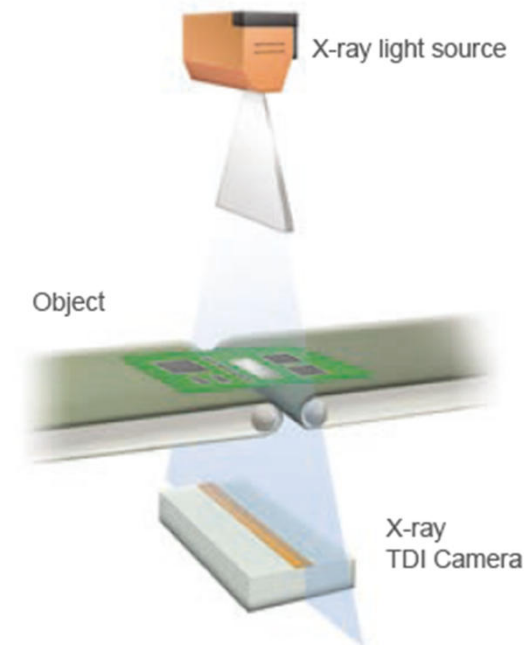

160 kV L11091



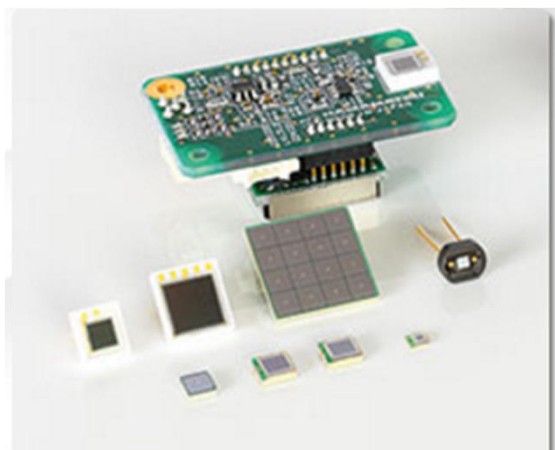
160 kV L10711-03



230 kV L10801



OPTICAL SENSORS HUB



Fire Detectors

UVTRON® R9533, R9454

Quick detection of flame from a distance

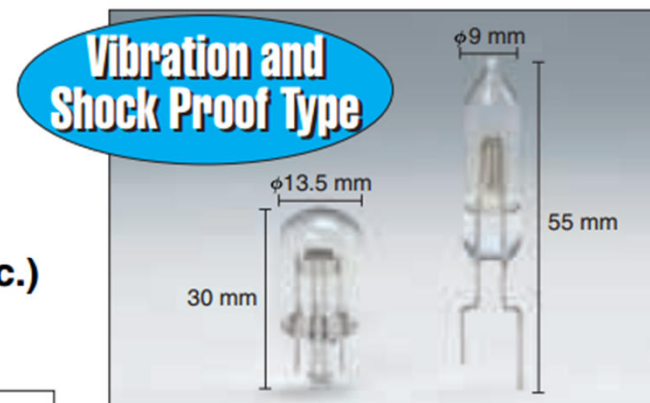
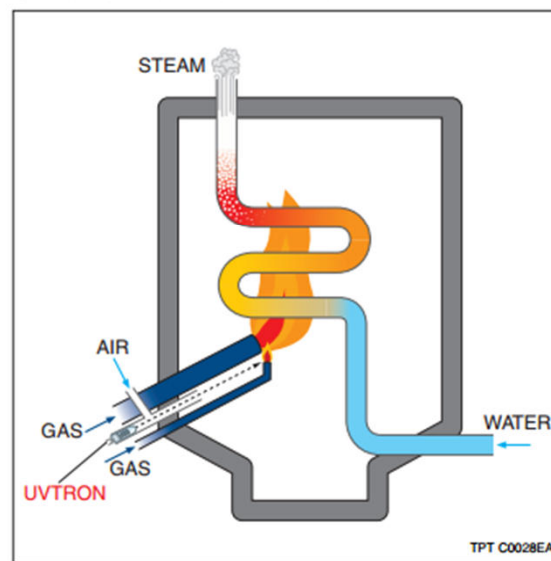
APPLICATIONS

- Flame detectors for gas/oil lighters and matches
- Combustion monitors for burners
- Detection of discharge (corona discharge of high voltage transmission lines, etc.)

● Flame detector

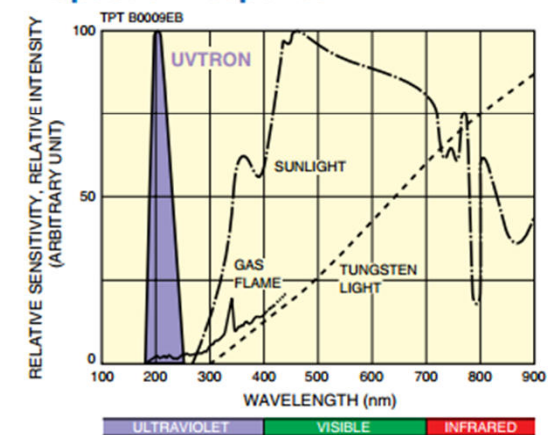


● Boiler flame monitor



Left: R9533, Right: R9454

Spectral Response



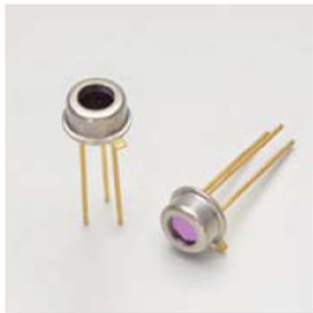
sCMOS CAMERAS for NIGHT VISION



Sensors and Emitters for Gas Sensing

NEW

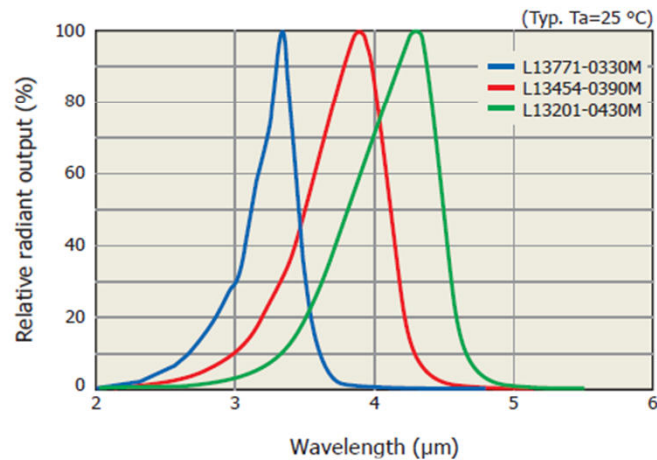
Mid infrared LED



■ Features

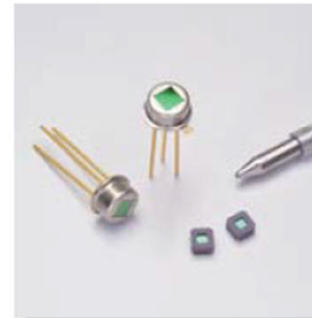
- High output power
L13771-0330M (3.3 μm): 0.25 mW
L13454-0390M (3.9 μm): 0.15 mW
L13201-0430M (4.3 μm): 0.1 mW
- High-speed response
- High stability
- Low power consumption

■ Emission spectrum



NEW

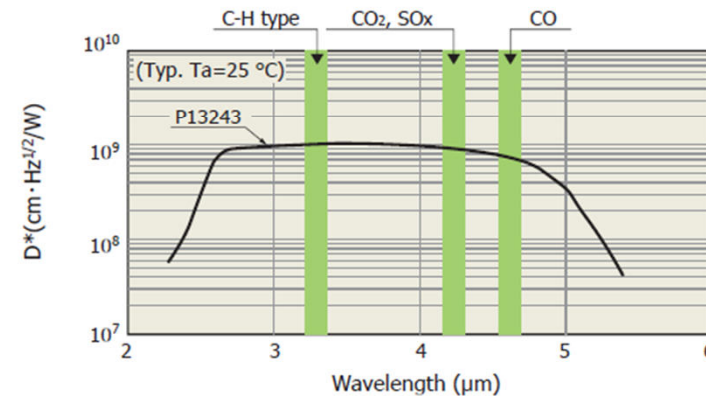
InAsSb photovoltaic detectors (Non-cooled type, 5 μm band max.)



■ Features

- High sensitivity
- Non-cooled type
- Small package
- RoHS compliance

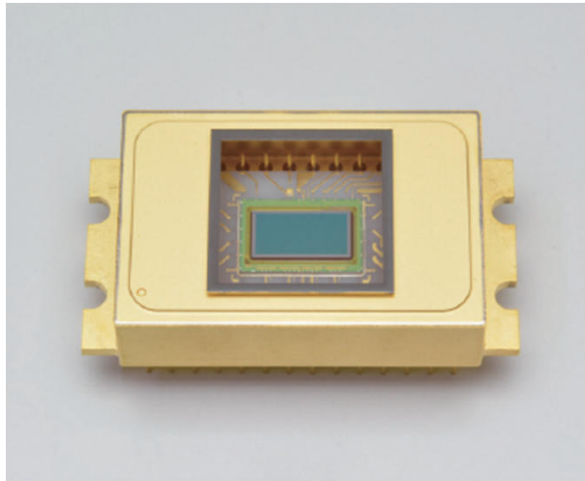
■ Spectral response



Type no.: P13243 series



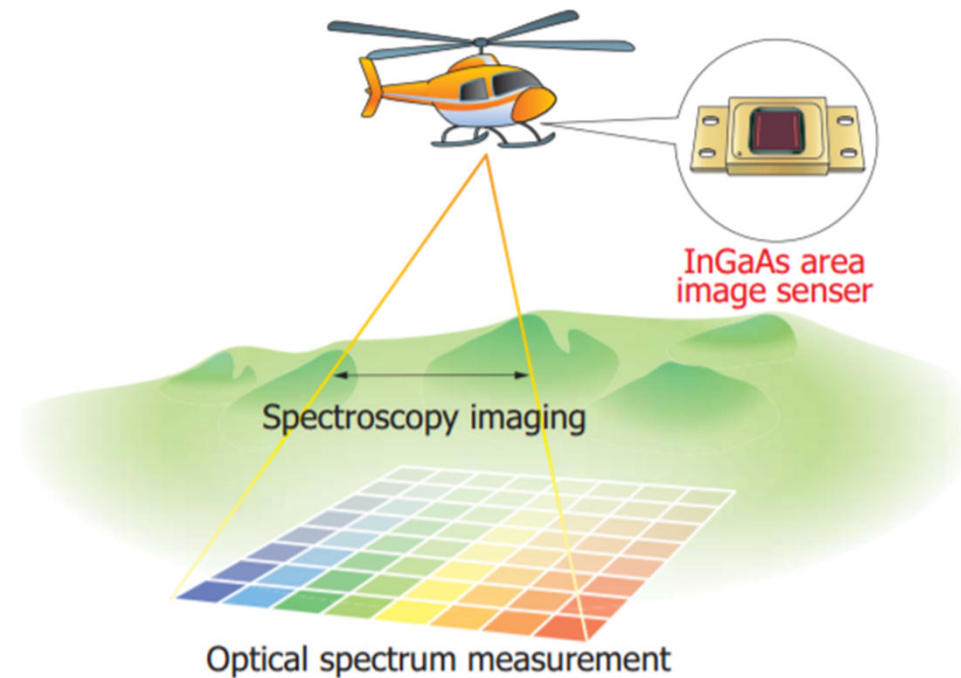
InGaAs Image Sensors: Hyperspectral Imaging



Resolution: 64 x 64, 128x128, 320x256, 640x480

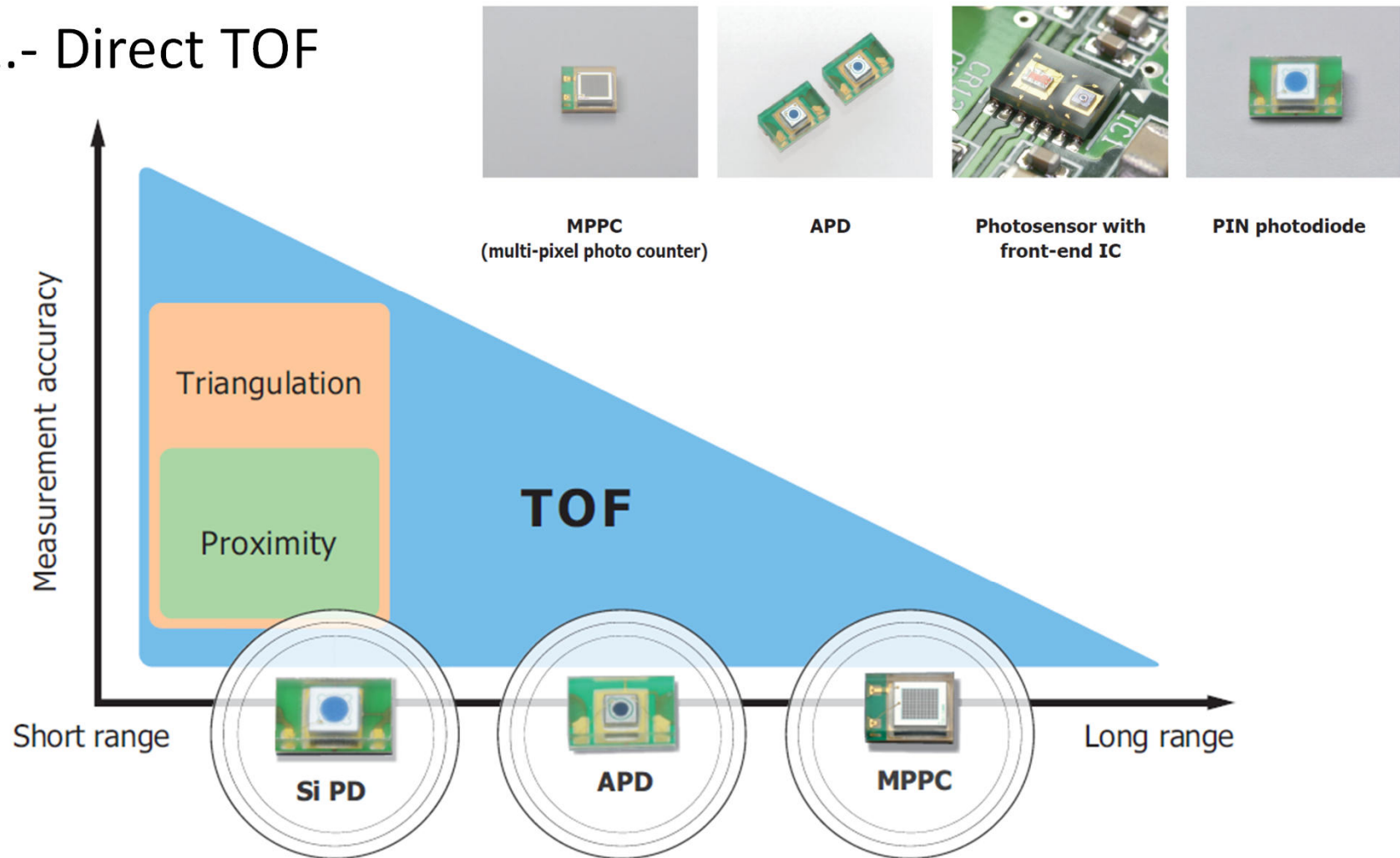
Sensitivity: 1,7um, 1.9um, 2.1um, 2.2um

Framerate: Up to 1000fps

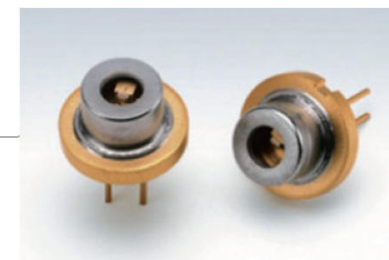


LIDAR

1.- Direct TOF

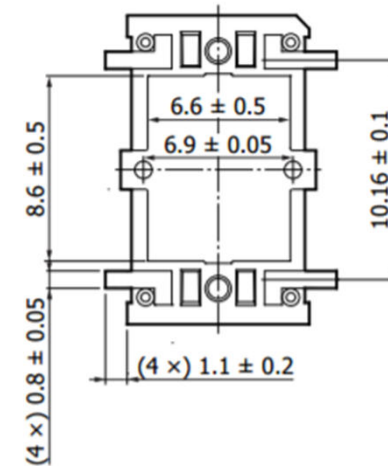
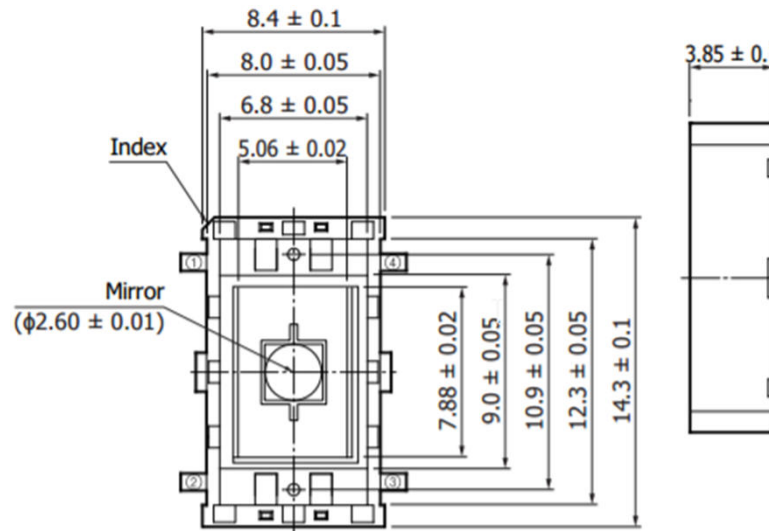
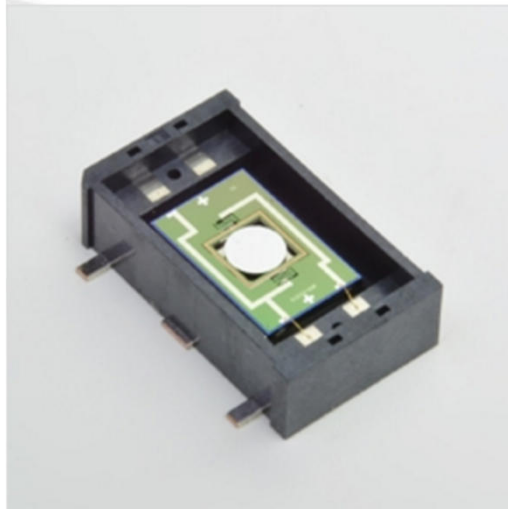


LIDAR: Pulsed LD

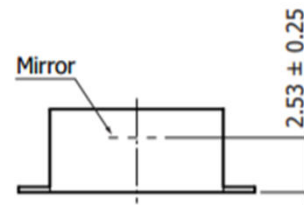
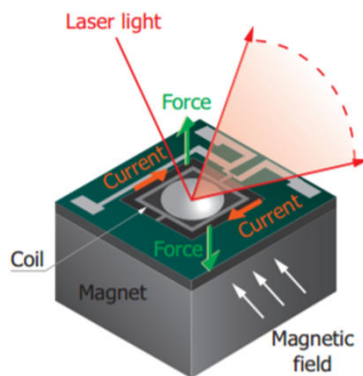


Product	Peak output power (W)	Peak emission wavelength (nm)	Emitting area size (μm)	Duty ratio (%)
Pulsed laser diode L6690-53	10	870	$100 \times 1 \mu\text{m}$	0.1
Pulsed laser diode L11649-120-04	20	870	$200 \times 1 \mu\text{m}$	0.1
Pulsed laser diode L11348-307-05	21	870	$70 \times 10 \mu\text{m}$	0.1
Pulsed laser diode L11854-307-05	21	905	$70 \times 10 \mu\text{m}$	0.1
Pulsed laser diode L12169-336-51	100	870	$360 \times 10 \mu\text{m}$	0.1
Pulsed laser diode L11854-336-05	100	905	$360 \times 10 \mu\text{m}$	0.1

MEMS MIRROR for LASER scanning, LIDAR, Projection



Structure diagram

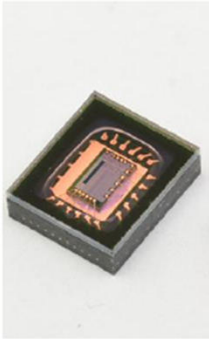
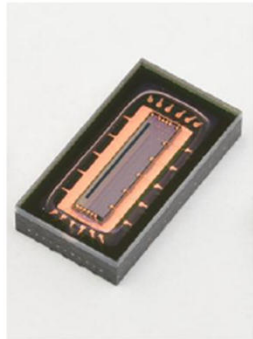
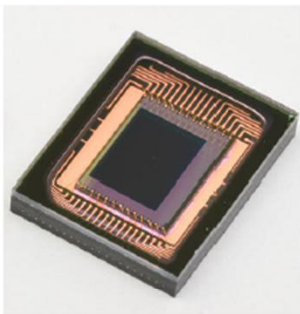


- ① NC
- ② Coil2
- ③ Coil1
- ④ NC

Position accuracy of mirror relative to package center: ± 0.15

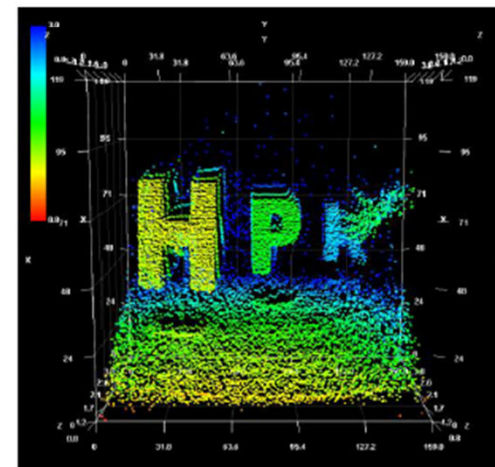
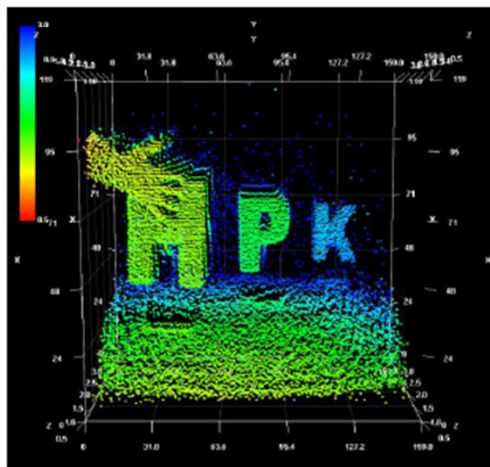
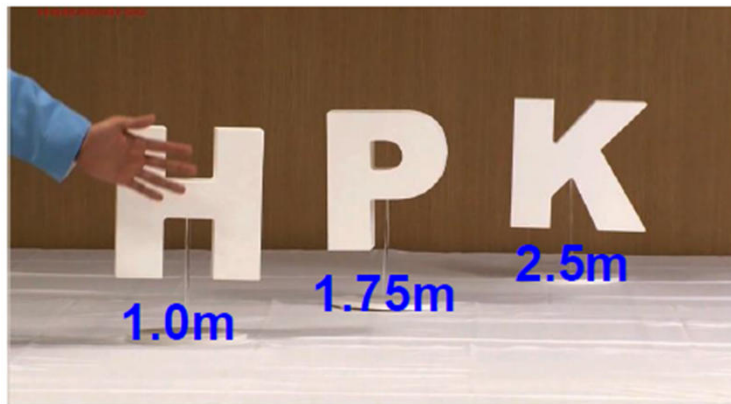
LIDAR

2.- Indirect TOF

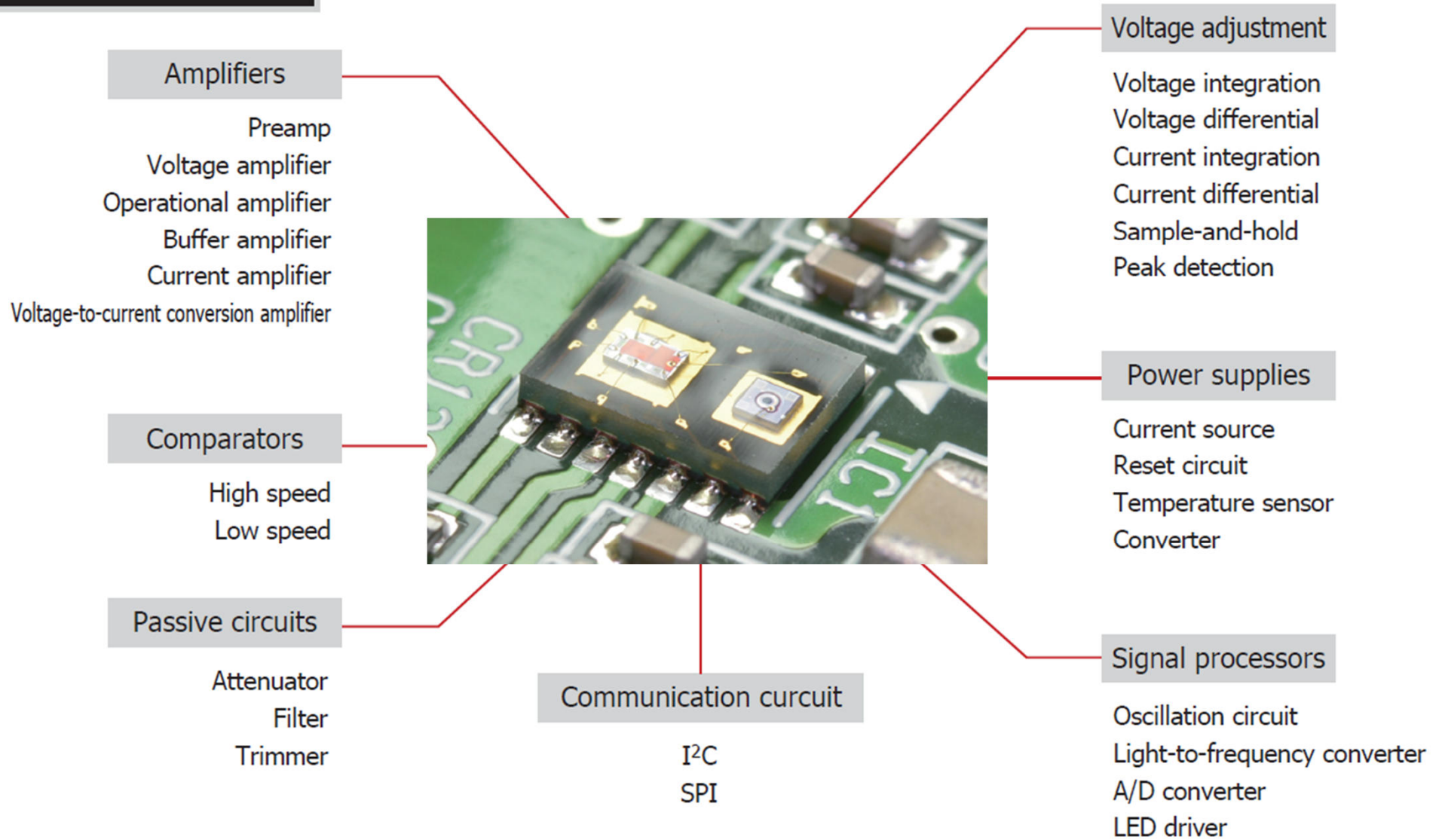
Type No.	S14252	S14253	S14254
Type	Linear type		Area type
Device			
Number of pixels	64	256	96×72
Pixel size	20μm(Pitch) × 50μm(Height)		50μm×50μm
Modulation frequency	16.7MHz(t=30ns)		
Light suppression	Built-in		
Power supply	3.3V		

LIDAR

2.- Indirect TOF



Circuit example



CONCLUSIONS

- We design, produce, test and package optoelectronic sensors and emitters for vast range of applications in the industrial sector, although we don't reach the application
- Possibility of customization
- Please contact us if you have any need on optical sensing

Thank you very much!

Hamamatsu Photonics
C/Argenters 4, Ed.2, 08290
Cerdanola del Vallés(Barcelona)
SPAIN
T. 935 824 430
www.hamamatsu.es