

LATEST PRODUCTS 01

HAMAMATSU

PHOTON IS OUR BUSINESS

BIANNUAL CATALOG | July, 2024

OPTICAL COMPONENTS

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LCOS-SLM | X15213-03CL/-03CR

New optical phase modulator
ideal for 3D metal printing



OPTICAL SENSORS

05

Si APD | S15415-02/-05

High-speed and compact
gain-stabilized APD.

LIFE SCIENCE & MEDICAL SYSTEMS

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FDSS-GX | C15711-02

High-performance kinetic
plate imager.

Dear Readers,

Welcome to the inaugural edition of Hamamatsu's Latest Products. In this biannual release, we've curated a selection of key products, ranging from light and radiation sources to optical sensors, components, and complete systems.

We are excited to announce our official partnership with Vrije Universiteit Brussel, a renowned European research institute, and PhotonHub Europe, the digital innovation hub for photonics. Through these new alliances, we have launched a new service called Pilot Line, designed to bridge the gap between the initial conceptualization of a photonics module and the realization of a reliable, market-ready product (check p.10 for more details).

Finally, I invite you to read the fascinating interview with our President, Tadashi Maruno, as we celebrate Hamamatsu's 70th anniversary. Gain insights from his reflections on how we have navigated and triumphed over adversity throughout the decades.

Enjoy the read!



Max Skoglund

Managing Director
Hamamatsu Photonics Europe

Hamamatsu's 70th anniversary

Read President Tadashi Maruno's
interview

www.hamamatsu.com



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Discover our full product
range, visit our website:

www.hamamatsu.com

LIGHTNINGCURE® LC-L5G

GH-103A L15346-3A04-007/007C

Brightest air-cooled UV-LED on the market.

Our LIGHTNINGCURE® LC-L5G series features linear irradiation type UV-LED light sources, including the GH-103A which stands out with its unmatched peak intensity achieved through an exclusive proprietary air-cooling method, making it exceptionally well-suited for high-speed printing—a capability traditionally challenging for standard UV-LED sources.

UPDATE

Increased the UV light emission to an intensity more than twice that of conventional products. Our unique nitrogen purge system can efficiently remove nitrogen at 27 normal liters per minute, enabling high-speed paper transport of up to 150 meters per minute under nitrogen purge conditions.

FEATURES

- Brightest air-cooled UV-LED on the market
- Air-cooling mechanism (prevents the formation of hotspots)
- Available with N₂ purge



APPLICATION EXAMPLES

- UV printing
- UV coating
- UV adhesive curing

[Learn more](#)

LIGHTNINGCURE® LC-L5G

GA-107 L13344-1104

Expect high output thanks to its proprietary air-cooling method.

Our LIGHTNINGCURE® LC-L5G series features linear irradiation type UV-LED light sources. The GA-107 model is capable of irradiating large samples in a single batch presenting a cost-effective alternative to UV ovens.

UPDATE

Enhanced capability to irradiate a larger sample in one pass compared to conventional products needing multiple passes.

FEATURES

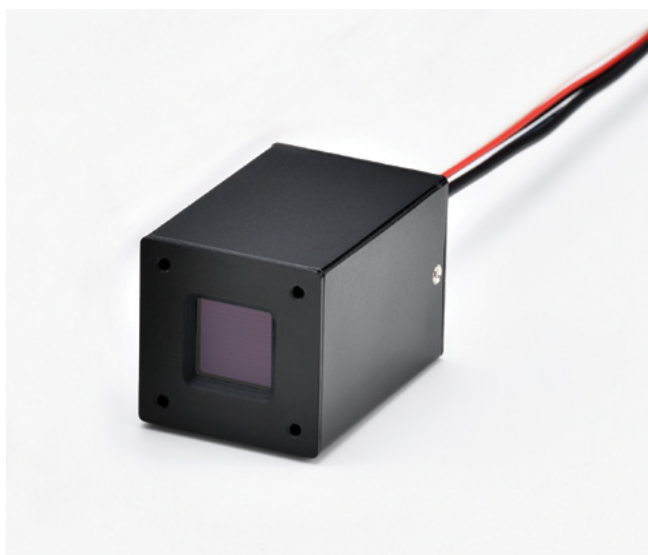
- Large light emission window size: 107 x 108 mm
- UV irradiance within the irradiation area at a recommended distance of 10 mm: 1.5 W/cm²



APPLICATION EXAMPLES

- UV coating
- UV adhesive curing

[Learn more](#)



FEATURES

- High quantum efficiency: GaAsP photocathode
- Large effective area: 14 mm
- H15460 SERIES: Voltage output
- H15461 SERIES: Current output

Photomultiplier tube modules

H15461-40

High quantum efficiency PMT module.

The H15461-40 photomultiplier tube module employs a GaAsP photocathode photomultiplier tube, boasting a photosensitive area of 14 mm square, making it ideal for multiphoton excitation microscopes.

UPDATE

Employed a GaAsP photocathode with an effective area ten times larger than conventional products, enabling two-photon excitation microscopes to achieve a combination of expansive field of view and high resolution.

APPLICATION EXAMPLES

- Multiphoton microscopy
- Deep mouse brain imaging
- Wide field-of-view
- Deep imaging

[Learn more](#)



FEATURES

- High sensitivity in 300 nm to 500 nm
- Low noise
- Low dark count at 37°C
- Compact size
- Photon counting
- High reliability for shock and vibration

Photomultiplier module

R1924P-700

High sensitivity, low noise PMT.

The R1924P-700 features a 25 mm diameter head-on type design, equipped with a blue super bialkali photocathode boasting an effective area of 22 mm diameter and a spectral response ranging from 300 nm to 650 nm. It stands out with its low noise and high sensitivity within the 300 nm to 500 nm range and operates as a photon counting type, akin to the R1924A-700 model.

UPDATE

Increased quantum efficiency from 25 % to 33 % at 400 nm compared to the conventional bialkali photocathode (R1924P). Despite its high sensitivity, the dark count is kept as low as 150 s⁻¹ at 37°C, ensuring a high S/N in specimen examinations.

APPLICATION EXAMPLES

- Chemiluminescence measurement
- Bioluminescence measurement
- Low level light detection
- Radiation measurement

[Learn more](#)

Si APD

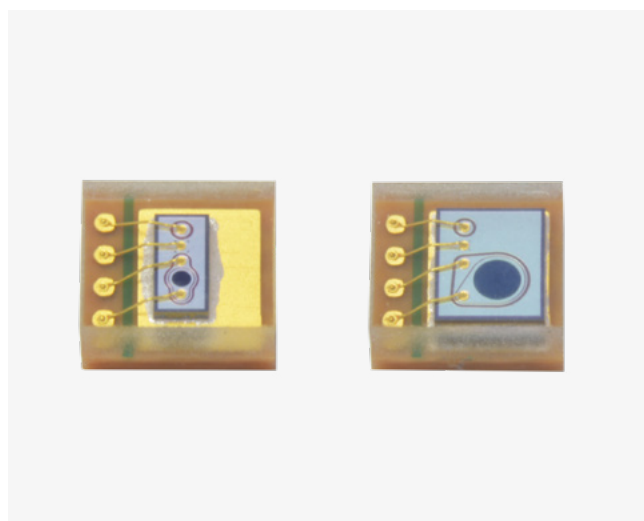
S15415-02, S15415-05

Compact Si APD with high-speed capabilities and no temperature adjustment needed.

The S15415 is a series of gain-stabilized APDs (GS APDs) with a built-in temperature compensation function within the sensor, ensuring constant gain without the need for temperature adjustment. They are suitable for laser monitors of optical rangefinders used in a wide range of applications, from consumer electronics to industrial equipment.

FEATURES

- Built-in temperature compensation function
- Compact package: $2.0 \times 1.8 \times 0.85^1$ mm
- Peak sensitivity wavelength: 840 nm (M=50)
- High-speed response: Cutoff frequency=500 MHz typ.
($\lambda=905$ nm, M=50)



APPLICATION EXAMPLE

- Optical rangefinders

[Learn more](#)

Photosensors with front-end IC

S16430-01CR, S16429-01CT/-02CT

Built-in gain-stabilized APD suitable for short pulse light detection.

These devices are for direct TOF (time-of-flight) distance measurement, integrating a Si APD and a transimpedance amplifier. A gain-stabilized APD (GS APD) is used, and there is little gain fluctuation relative to temperature fluctuation, eliminating the need for a temperature sensor or microcontroller. Furthermore, they boast an enhanced high-band cutoff frequency (300 MHz max.) in the transimpedance amplifier compared to previous products, ensuring high-speed response.

FEATURES

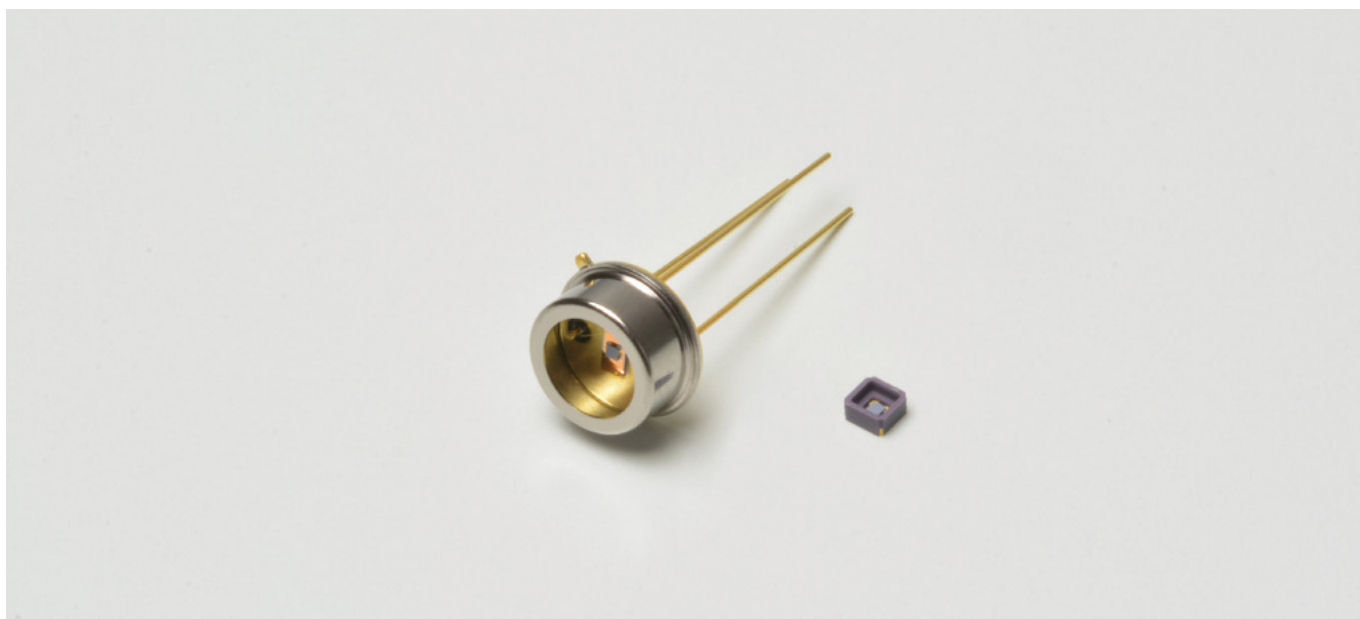
- 16 channel parallel output (S16430-01CR)
- Stable gain against temperature fluctuations
- No gain adjustment according to individual differences required
- Built-in high-speed transimpedance amplifier: 300 MHz max.
- Low noise
- No ringing



APPLICATION EXAMPLES

- Distance measurement
- Presence or absence of objects

[Learn more](#)



InAsSb photovoltaic detectors

P16113/P16114-011MN, P16613/P16614-011CN

Back-illuminated & highly sensitive infrared detectors capable of room temperature operation (up to 8/10 μm band).

Our infrared detectors boast high sensitivity thanks to our unique crystal growth and process technology. Leveraging a back-illuminated structure, the sensitivity has been improved compared to the front-illuminated type. Committed to environmental sustainability, these detectors are free from lead, mercury, and cadmium, aligning with the RoHS Directive. Serving as eco-friendly alternatives, they replace conventional products containing these restricted substances.

UPDATES

Introduced a room temperature type for the 8 μm band, eliminating the need for cooling. Enhanced sensitivity in the 10 μm band by adopting a back-illuminated structure, resulting in superior performance compared to conventional front-illuminated types.

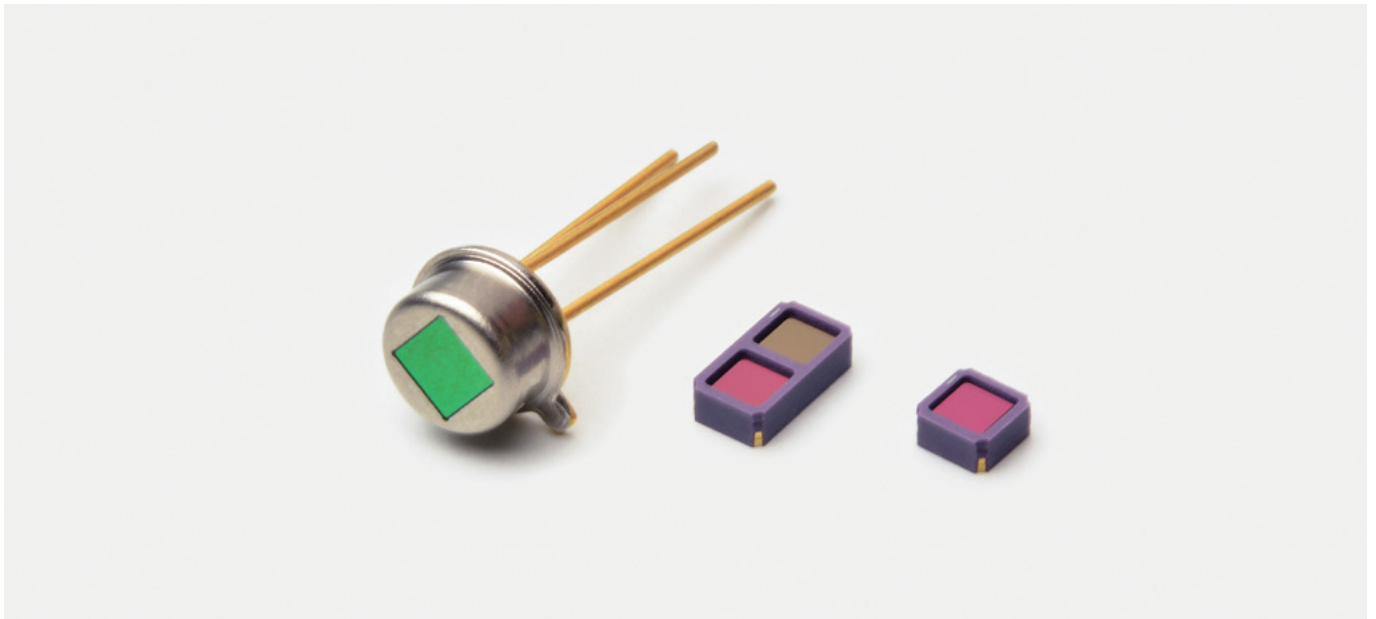
FEATURES

- High sensitivity
- High-speed response
- High shunt resistance
- Compact, surface mount type ceramic package
- Compatible with lead-free solder reflow
- RoHS compliant (lead, mercury, cadmium free)

APPLICATION EXAMPLES

- Gas detection (SO_x , NO_x , NH_3 , O_3 , etc.)
- Radiation thermometers
- Mid infrared spectroscopy

[Learn more](#)



InAsSb photovoltaic detectors

P16112/P16612/P16849 series

Back-illuminated infrared detectors with band-pass filter.

These InAsSb photovoltaic detectors feature a band-pass filter for the window material, enhancing their performance. Employing a back-illuminated structure, we have significantly improved the sensitivity temperature coefficient compared to front-illuminated types. Other types equipped with band-pass filters at 3.3 μm , 3.9 μm , or 4.26 μm are tailored for gas measurement, while those with a 4.45 μm band-pass filter are better in flame monitoring applications. These environmentally friendly infrared detectors comply with RoHS directives by excluding lead, mercury, and cadmium. Additionally, a two-element type capable of detecting two wavelengths is available.

UPDATE

Significantly improved temperature coefficient of sensitivity compared to the front-illuminated type (P13243 series).

FEATURES

- High sensitivity
- High-speed response
- High shunt resistance
- Compact, surface mount ceramic package
- Compatible with lead-free solder reflow

APPLICATION EXAMPLES

- Gas measurement (CH_4 , CO_2)
- Flame monitors (CO_2 resonance radiation)

[Learn more](#)



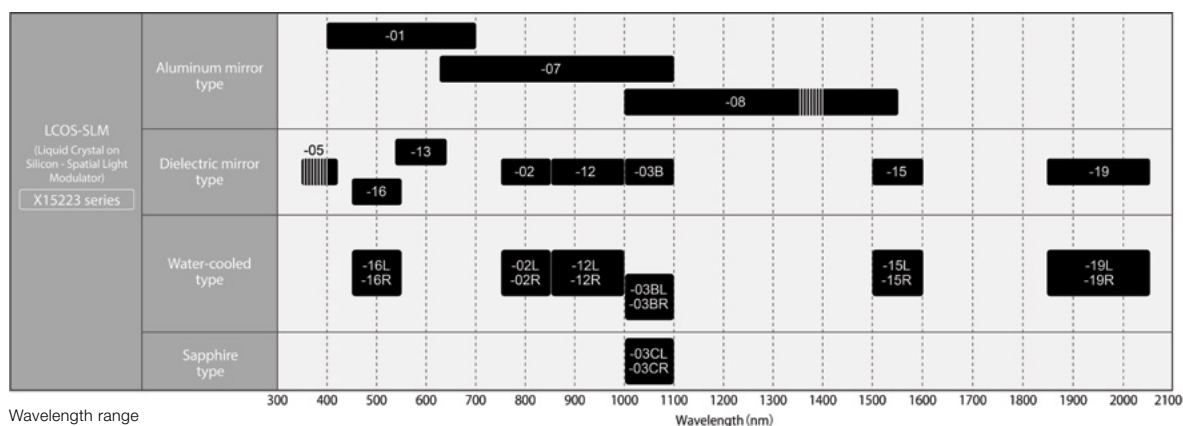
LCOS-SLM (optical phase modulator)

X15213-03CL/-03CR

LCOS-SLM with sapphire glass ideal for 3D metal printing.

The X15213 series features reflective pure-phase Spatial Light Modulators (SLMs) based on Liquid Crystal on Silicon (LCOS) technology, offering precise voltage control of Liquid Crystal (LC) to modulate light beam wavefronts. The LCOS-SLMs are carefully designed for high light utilization efficiency from various points of view including reflectivity, aperture ratio and diffraction noise due to the pixel structure and are controllable via PC using Digital Video Interface (DVI). The controller efficiently compensates for distortions in the LCOS chip, ensuring easy PC control and achieving precise and linear phase modulation characteristics alongside high diffraction and light utilization efficiency.

UPDATE Newly designed with sapphire glass in the lineup.



FEATURES

- Compatible with high-power lasers of 700 W or more
- Pure, linear and precise phase control
- High light utilization efficiency
- High diffraction efficiency
- High power handling capability
- Easy to use (DVI compatible)
- Reflective type

APPLICATION EXAMPLE

- Optical beam pattern shaping
- Laser processing & marking
- Optical manipulation & tweezers
- Wavefront aberration correction
- Adaptive optics
- Optical cortex generation
- Pulse shaping
- 3D metal printing

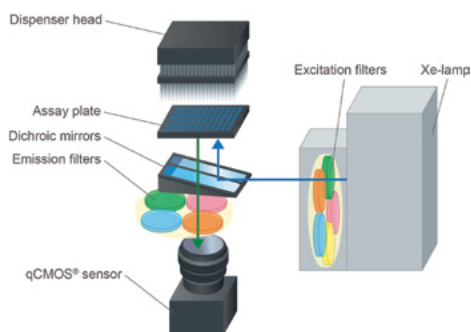
[Learn more](#)



FDSS®-GX Kinetic Plate Imager C15711-02

High-performance kinetic plate imager.

FDSS®-GX is the highest-performance kinetic plate imager in the FDSS® series, optimized for 96-, 384-, and 1536-well plate formats to ensure reliable and stable High Throughput Screening (HTS). This new system enables whole microplate imaging and simultaneous injections to all wells, delivering high sensitivity imaging with quantitative CMOS (qCMOS®) sensor. Additionally, its integration of a 1536 channel dispensing unit enables highly accurate and repeatable micro-dispensing of dispensing variable volumes. Furthermore, a robot-free semi-automation system can be built according to the user's needs by combining optional parts.



High-precision epifluorescence optical system.

FEATURES

- 1536 channels manifold pipettor head with independent metal piston cylinders
 - Dispensing performance
- High sensitivity and high-resolution imaging with qCMOS® sensor
 - Detection sensitivity in fluorescence and luminescence
 - Comparison of whole plate imaging
- High-precision epifluorescence optical system with high power and long life Xe-lamp

APPLICATION EXAMPLE

- Ca^{2+} assays for fluorescence
- Membrane potential assays
- Other ion channel assays
- FRET assays
- iPSC-derived cells
- Ca^{2+} assays for luminescence
- BRET assays
- cAMP assays
- Cell number evaluation using CytoTox-Glo™ cytotoxicity assay



Dispensing unit (1536 tip type).

[Learn more](#)



Pilot Line

New offering for advanced module solutions

Hamamatsu is thrilled to introduce its new service, Pilot Line, in collaboration with **Vrije Universiteit Brussel (VUB)** and **PhotonHub Europe**, a leading digital innovation hub for photonics. This partnership combines Hamamatsu's extensive industry expertise with VUB's cutting-edge photonics research to create a powerful platform for photonics innovation.

Pilot Line is designed to streamline the development process of photonics modules, bridging the gap between the initial concept and the market-ready product. By leveraging advanced research and innovative offerings from PhotonHub, the service ensures that photonics modules are reliably designed and fully prepared for industrial application. This initiative represents a significant advancement in the field of photonics, offering a seamless pathway from R&D to commercialization.

With Pilot Line, Hamamatsu aims to accelerate the development of high-quality photonics products, driving forward technological progress and industrial collaboration. This service promises to be a game-changer for companies looking to bring innovative photonics solutions to market efficiently and effectively.

For more information, **Peter Seitz**, Senior Technologist at Hamamatsu Photonics Europe and also a member of the Executive Board of Photonics21, explores the objectives behind the innovative Pilot Line service. As one of the leaders of this new service, Seitz provides insights into the partnership with Vrije Universiteit Brussel, key benefits for clients, and the strategic significance of this initiative.

Read the exclusive interview with Peter Seitz on our Pilot Line team page at www.pilot-lines.com



IMPRESSUM

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