InGaAs multichannel detector head

C10854

Near infrared line camera (Line rate: 31.25 kHz)

The C10854 is a multichannel detector head suitable for applications where high-speed response is required, such as SD-OCT (spectral domain-optical coherence tomography) and sorting machines. The HAMAMATSU G10768 series InGaAs near-infrared linear image sensor (sold separately) can be easily installed in the C10854.

The C10854 comes with application software (DCam-CL) that runs on Microsoft® Windows® 7 (32-bit, 64-bit)/10 (32-bit, 64-bit) and controls the C10854 from a PC. The application software also includes a function library (SSDic.dll) for the C10854, allowing you to develop your own software by using Microsoft® Visual Studio® 2008 or later, or National Instruments IMAQ developmental environment.

Features

→ **High-speed operation: 5 MHz**

→ **Line rate: 31.25 kHz**

→ **1024 pixels (128 pixels × 8 ports)**

→ **Supports CameraLink**

Note: Microsoft, Windows and Visual Studio are either registerd trademarks or trademarks of Microsoft Corporation in the United States and other countries.
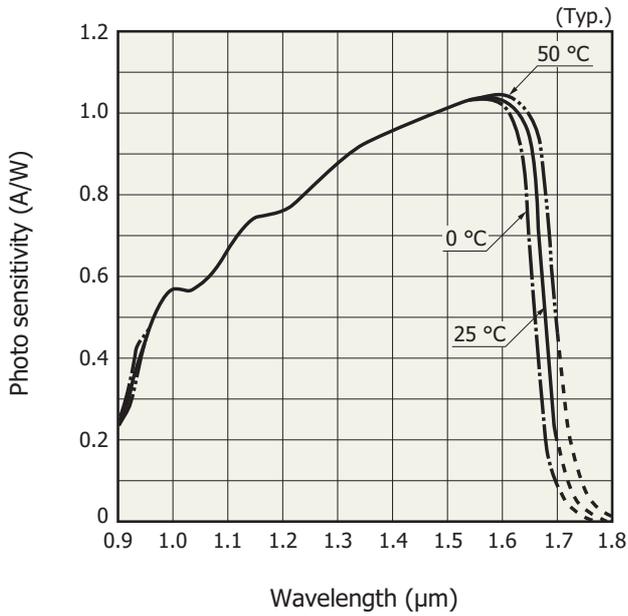
Applications

→ **Foreign object screening**

→ **OCT (optical coherence tomography)**

→ **Near infrared spectroscopy**

The table below shows InGaAs linear image sensors applicable for the C10854 (sold separately).

Type no.	InGaAs linear image sensor			
	Spectral response range (µm)	Number of pixels	Pixel size (µm)	Effective photosensitive area length (mm)
G10768-1024D	0.9 to 1.7	1024	25 × 100	25.6
G10768-1024DB			25 × 25	

Specifications (Unless otherwise noted, Typ. Ta=25 °C)

Parameter	Condition	Specification	Unit
Clock frequency		5	MHz
Line scan rate		31.25	kHz
Line readout time		32	µs
Data transfer time		17.07	µs
Total transfer time		49.07	µs
A/D conversion resolution		16	bit
Video output		16-bit, CameraLink (Base configuration)	-
Interface		RS-232C	-
Supply voltage	±5%, 1 A max.	+5	Vdc
Operating temperature	No codensation	0 to +50	°C
Storage temperature		-20 to +70	°C
Dimension	Excluding projecting parts	69.5 (L) × 80 (W) × 65 (H)	mm
Weight		330	g

Spectral response (G10768 series)

(Typ.)

[Graph: Photo sensitivity (A/W) vs Wavelength (µm)]

Y-axis: Photo sensitivity (A/W), 0 to 1.2
X-axis: Wavelength (µm), 0.9 to 1.8

Curves labeled: 50 °C, 0 °C, 25 °C

KMIRB0042EB

Connection example

Laser

Mechanical shutter

Pulse generator, etc.

Power supply
(DC+5 V)

InGaAs multichannel
detector head
C10854

Serial
communication

CameraLink

PC + Frame grabber board

KACCC0469EA

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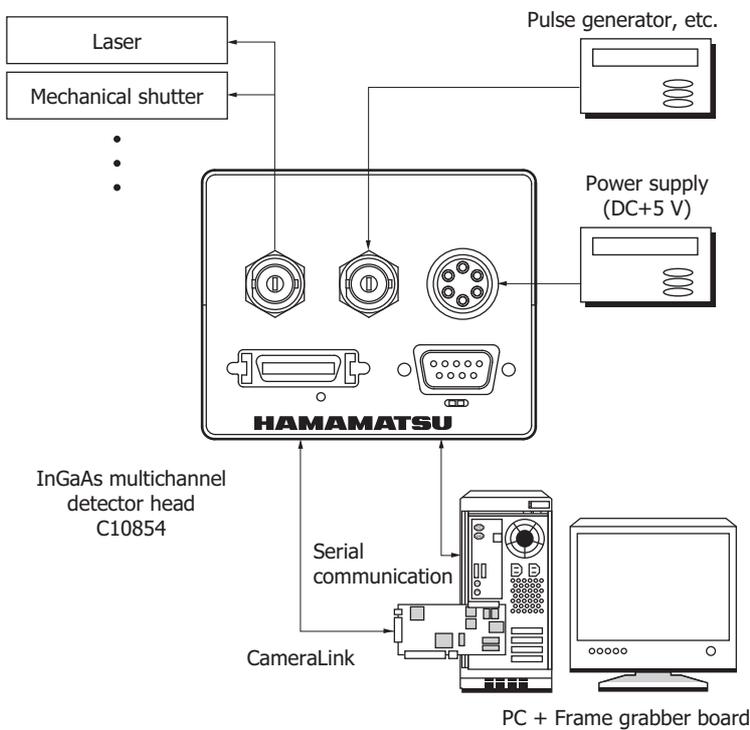
▶ Functions

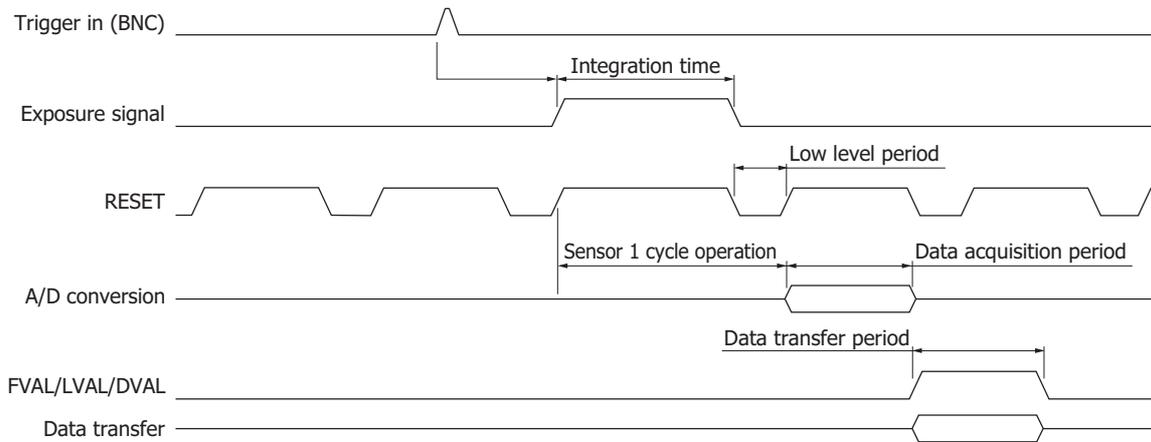| Parameter		Specifications
Operation mode	"Standby" mode (white LED lighting)	It is standby state. At this moment, the InGaAs linear image sensor is sweeping out dark current, by performing so called dummy scan operation.
	"Date transfer" mode (LED-green, aqua, blue, purple)	The multichannel detector head transfers data to PC. Color of LED changes depending upon the data acquisition mode.
Data acquisition mode	Internal synchronous mode ("Internal" mode)	Data is acquired on the basis of the trigger timing generated by application software.
	External synchronous edge mode 1 ("External edge 1" mode)	Data is acquired in synchronization with the external trigger signal input from the built-in BNC connector. Signal integration starts after an external trigger signal is input and any dummy operation ends.
	External synchronous level mode 1 ("External level 1" mode)	
	External synchronous edge mode 2 ("External edge 2" mode)	Data is acquired in synchronization with the external trigger signal input from the built-in BNC connector. Signal integration starts after an external trigger signal is input.
	External synchronous level mode 2 ("External level 2" mode)	
	External synchronous mode 2 ("External gating" mode)	Data is acquired in synchronization with the trigger timing from the application software and the external trigger signal input from the built-in BNC connector.
Offset adjustment		The offset value can be varied in the range of [0 to 511] with the step of 1. Default value is "10".
Pulse output setting		It is possible to perform the timing setup of the "pulse output signal (PULSE OUT)" outputted from the BNC connector used as PULSE_OUT of the multichannel detector head.
Selection of conversion efficiency*		Conversion efficiency can be selected from 4 different levels.

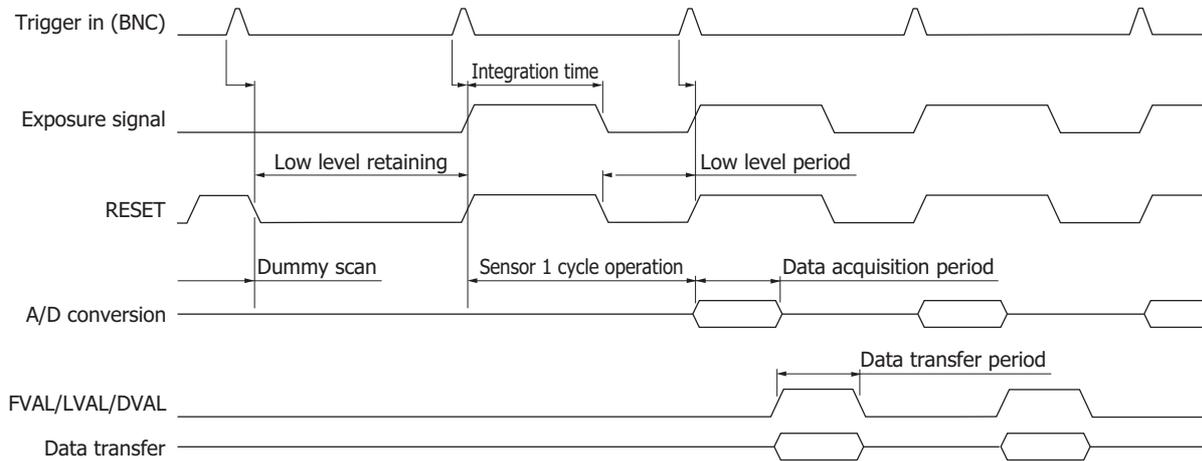* Refer to the datasheet "InGaAs linear image sensors G10768 series".

▶ Timing chart

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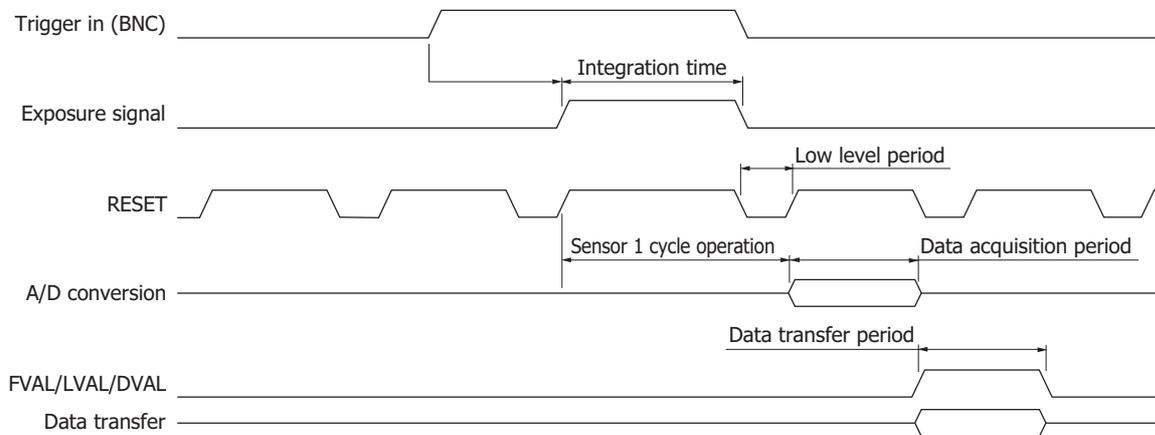## External synchronous edge mode 1 ("External edge 1" mode)

Trigger in (BNC)

Integration time

Exposure signal

Low level period

RESET

Sensor 1 cycle operation | Data acquisition period

A/D conversion

Data transfer period

FVAL/LVAL/DVAL

Data transfer
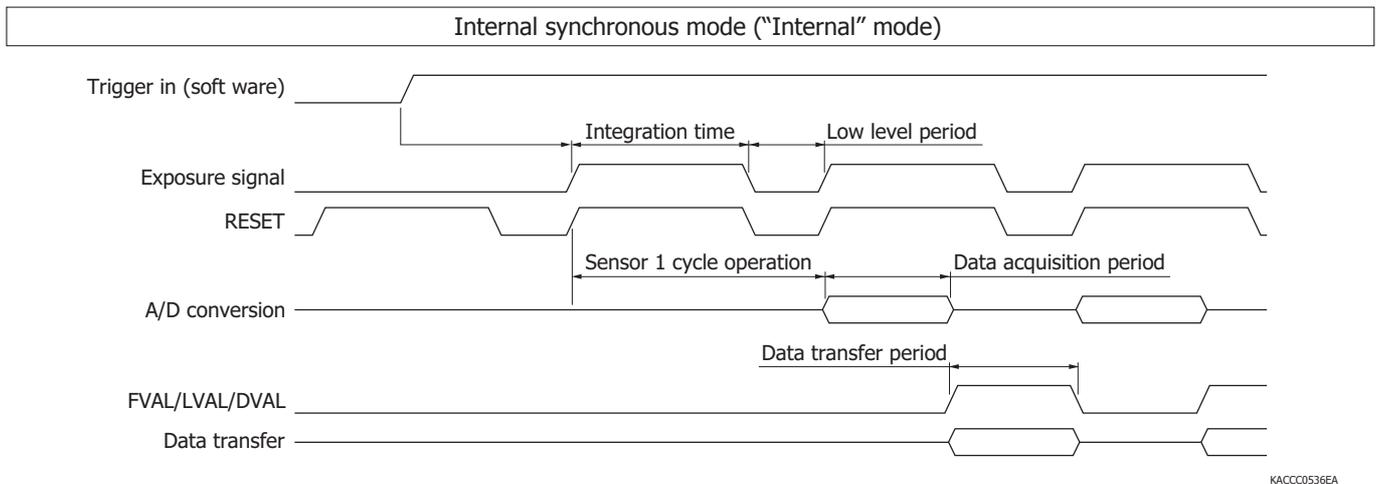
KACCC0537EA

External synchronous edge mode 2 ("External edge 2" mode)

Trigger in (BNC)

Integration time

Exposure signal

Low level retaining | Low level period

RESET

Dummy scan | Sensor 1 cycle operation | Data acquisition period

A/D conversion

Data transfer period

FVAL/LVAL/DVAL

Data transfer

Note: The input interval of external triggers must be longer than the integration time + low level period.

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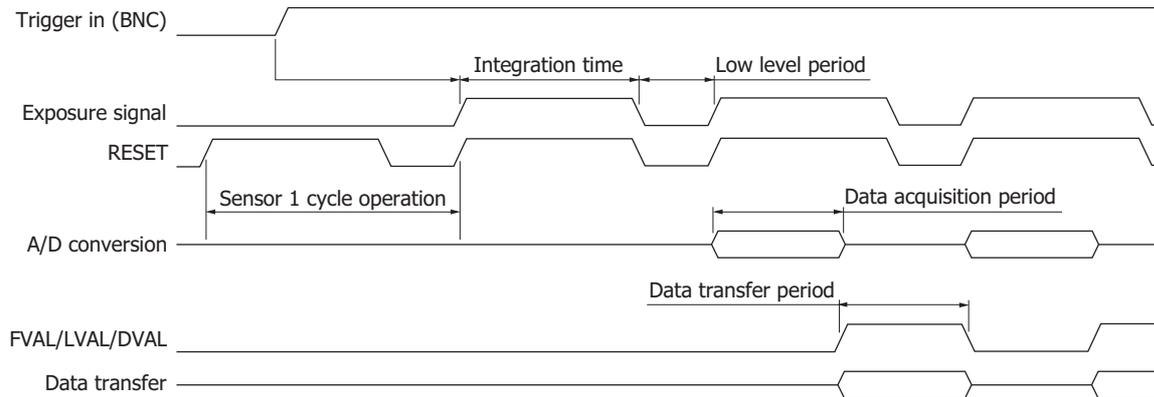## External synchronous level mode 1 ("External level 1" mode)

Trigger in (BNC)

Integration time

Exposure signal

Low level period

RESET

Sensor 1 cycle operation | Data acquisition period

A/D conversion

Data transfer period

FVAL/LVAL/DVAL

Data transfer

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External synchronous level mode 2 ("External level 2" mode)
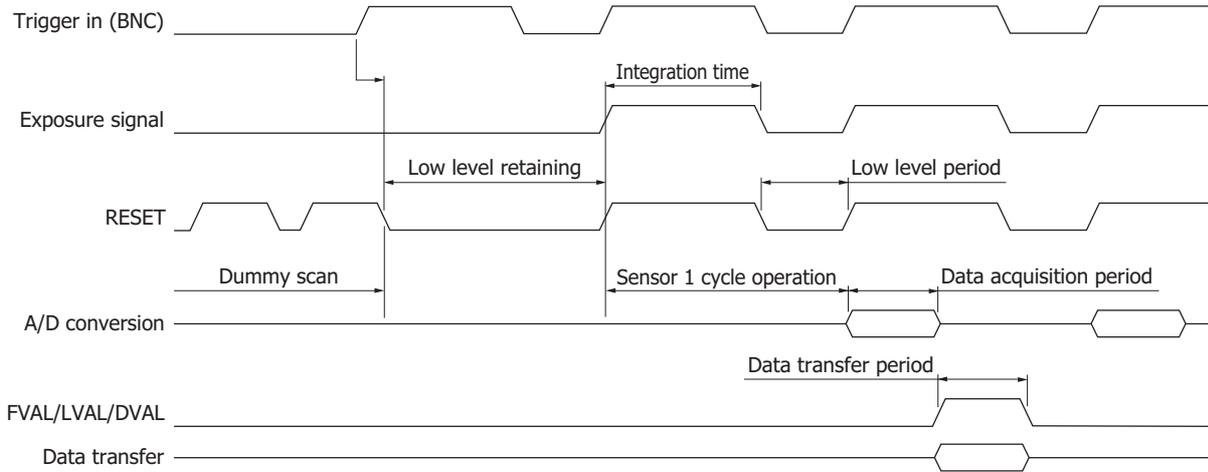
Trigger in (BNC)

Exposure signal

Integration time

RESET

Low level retaining

Low level period

Dummy scan

Sensor 1 cycle operation

Data acquisition period

A/D conversion

Data transfer period

FVAL/LVAL/DVAL

Data transfer

Note: The input interval of external triggers must be longer than the integration time + low level period.
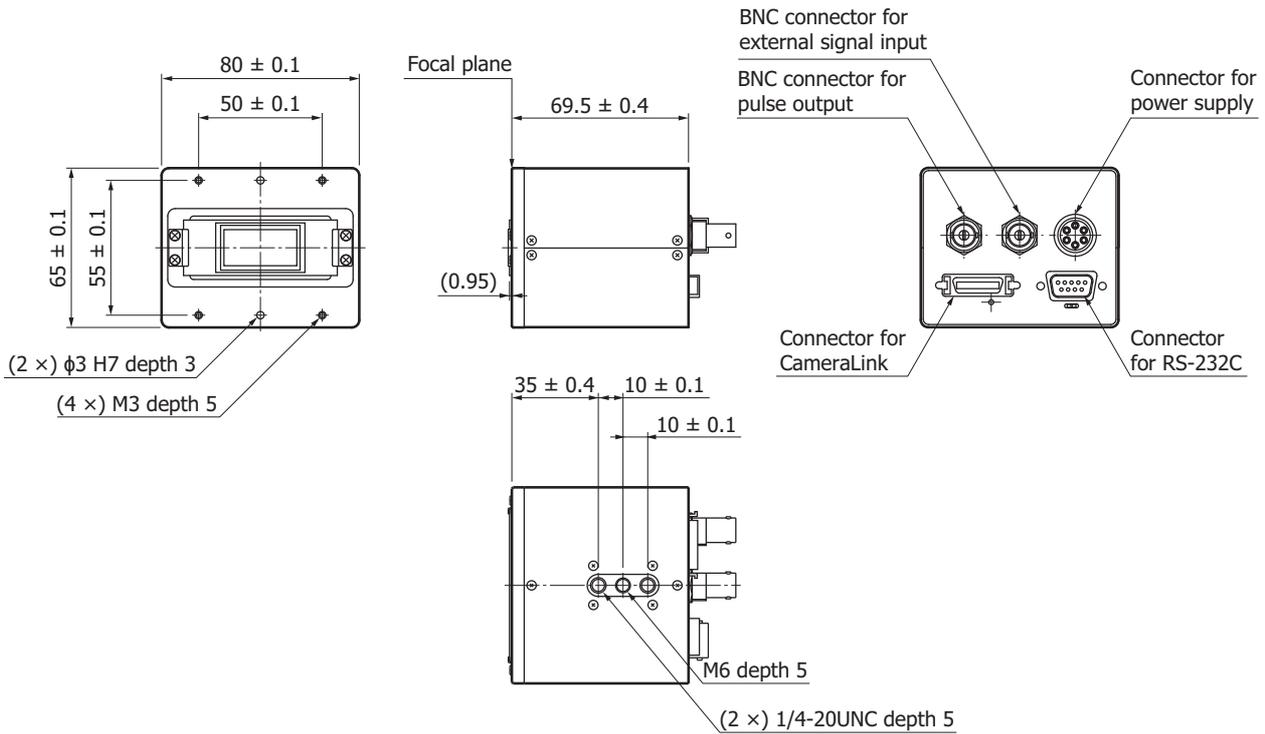The pulse width of external triggers must be longer than the low level period.

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External synchronous gate mode ("External gating" mode)

Trigger in (BNC)
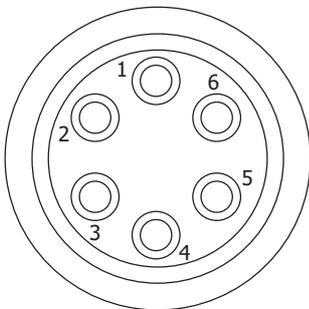
Integration time

Low level period

Exposure signal

RESET

Sensor 1 cycle operation

Data acquisition period

A/D conversion

Data transfer period

FVAL/LVAL/DVAL

Data transfer

KACCC0541EA

Dimensional outline (unit: mm)

80 ± 0.1
50 ± 0.1
65 ± 0.1
55 ± 0.1

(2 ×) φ3 H7 depth 3
(4 ×) M3 depth 5

Focal plane
69.5 ± 0.4
(0.95)

BNC connector for external signal input
BNC connector for pulse output
Connector for power supply

Connector for CameraLink
Connector for RS-232C

35 ± 0.4
10 ± 0.1
10 ± 0.1

M6 depth 5
(2 ×) 1/4-20UNC depth 5

KACCA0238EC

Pin connections

Connector for "POWER" [HIROSE RM12BRD-6PH (71)]

Pin no.	Signal
1	+5 V
2	+5 V
3	+5 V
4	GND
5	GND
6	GND

KACCC0470EA

Accessories

- Power cable (1.5 m)
- Application software (DCam-CL)
- Function library (SSDic.dll)

NOTE: A National Instruments frame grabber board and NI-IMAQ are required to use the supplied application software (DCam-CL) and function library (SSDic.dll). Operation of the following frame grabber boards has been verified.

Manufacturer	Model No.	Supported OS	Driver
National Instruments	PCIe-1427	Windows® 7 (32-bit, 64-bit), Windows® 10 (32-bit, 64-bit)	National Instruments tool (supplied with NI-IMAQ)
	PCIe-1429		
	PCIe-1430		
	PCIe-1433		

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Option (sold separately)

• F-mount adapter A11544

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions

· Notice

Information described in this material is current as of March 2017.

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

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