

CCD multichannel detector head C9047 series

Designed for back-thinned CCD area image sensors



C9047 series is an industrial camera with a high-speed, high resolution CCD (S9037-0902, S9037-1002) and usable in a wide range of applications including production line inspection and surveying. The CCD used in C9047 series is sensitive in the ultraviolet region (down to 130 nm *) making C9047 series ideal for UV laser applications.

As soon as power is turned on, C9047 series enters standby mode ready to output image data in synchronization with an external trigger signal. All camera settings can be made through serial communication ports (RS-232C).

The CCD mounted in the camera is a back-thinned FFT-CCD (Full Frame Transfer CCD) that receives light from the backside and therefore has very high UV sensitivity.

The camera body is compact yet designed to radiate heat efficiently away from the internal circuit and sensor. The CCD focal plane is flush with the front panel of the camera body making optical design easier.

Features

- Digital output
- Real-time digital sensitivity correction
- High UV sensitivity: sensitive down to 130 nm
- Fast line rate
 - S9037-0902: 16 kHz
 - S9037-1002: 9 kHz
- External trigger operation
- Easy handling
 - PC controllable (RS232C)
- Compact and lightweight

Applications

- Spectrophotometry
- High-speed UV imaging
- Bio-photon observation
- Semiconductor inspection

The table below shows CCD image sensors applicable for C9047 series.

Since C9047 series does not include CCD image sensors, so select the desired sensor and order it separately.

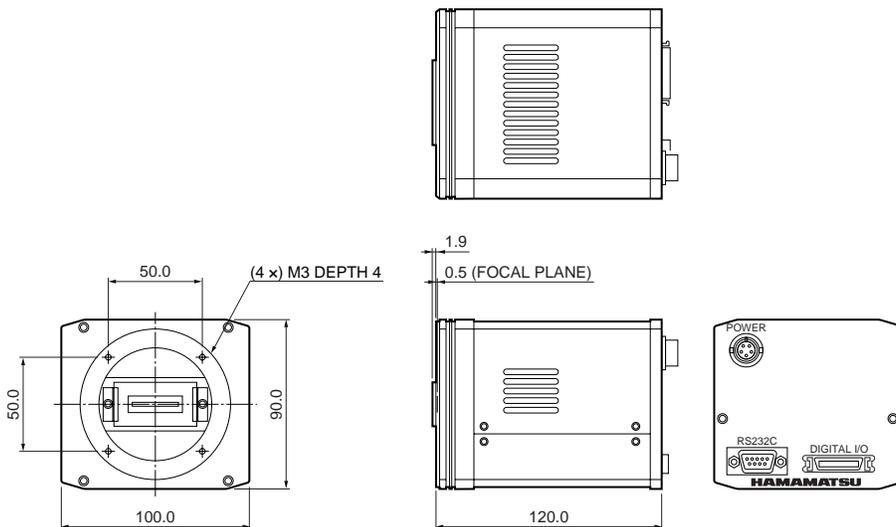
| Type No. | Number of total pixels | Number of active pixels | Active area [mm (H) × mm (V)] |
|------------|------------------------|-------------------------|----------------------------------|
| S9037-0902 | 520 × 6 | 512 × 4 | 12.288 × 0.096 |
| S9037-1002 | 1044 × 8 | 1024 × 4 | 24.576 × 0.096 |

*1: When the CCD sensor faceplate is removed.

Specifications

| Parameter | | C9047 | C9047-01 |
|----------------------------|-----------------|---|----------|
| CCD structure | | Back-thinned FFT-CCD | |
| Number of total pixels | S9037-0902 | 520 (H) × 6 (V) | |
| | S9037-1002 | 1044 (H) × 8 (V) | |
| Effective number of pixels | S9037-0902 | 512 (H) × 4 (V) | |
| | S9037-1002 | 1024 (H) × 4 (V) | |
| Pixel size | | 24 (H) × 24 (V) μm | |
| Effective active area | S9037-0902 | 12.288 (H) × 0.096 (V) mm | |
| | S9037-1002 | 24.576 (H) × 0.096 (V) mm | |
| Scanning rate | | 10 MHz | |
| Maximum line rate | S9037-0902 | 16 kHz | |
| | S9037-1002 | 9 kHz | |
| AD conversion resolution | | 12-bit | |
| Camera interface | | RS-422 | LVDS |
| Spectral response range | | 200 to 1100 nm | |
| Full well capacity | | 600,000 e ⁻ | |
| Conversion gain | | 145 e ⁻ /ADU (600,000 e ⁻ at 4095 ADC counts) | |
| Dark current | | 4,000 e ⁻ /pixel/s at +25 °C | |
| Readout noise | | 435 e ⁻ (3.0 ADU) at 10 MHz | |
| Supply voltage | Digital circuit | D. +5 V ± 0.25 V (600 mA Max.) | |
| | Analog circuit | A. +15 V ± 0.5 V (300 mA Max.) | |
| | Analog circuit | A. -15 V ± 0.5 V (300 mA Max.) | |
| Storage temperature | | -20 °C to +70 °C | |
| Operating temperature | | 0 °C to +50 °C | |
| Operating humidity | | 70 % Max. (no condensation) | |
| Dimension | | 90 (H) × 100 (W) × 120 (D) mm | |
| Weight | | Approx. 800 g | |

Dimensional outline (unit: mm)



KACCA0123EA

■ Pin connection of "DIGITAL I/O" connector (3M 10236-5202JL, 36-pin female connector)

| Pin No. | Signal name | Pin No. | Signal name |
|---------|-------------|---------|-------------|
| 1 | /RESET+ | 19 | /RESET- |
| 2 | /CNT+ | 20 | /CNT- |
| 3 | LEN+ | 21 | LEN- |
| 4 | NC | 22 | NC |
| 5 | DATA-TRIG+ | 23 | DATA-TRIG- |
| 6 | GND | 24 | GND |
| 7 | D00+ | 25 | D00- |
| 8 | D01+ | 26 | D01- |
| 9 | D02+ | 27 | D02- |
| 10 | D03+ | 28 | D03- |
| 11 | D04+ | 29 | D04- |
| 12 | D05+ | 30 | D05- |
| 13 | D06+ | 31 | D06- |
| 14 | D07+ | 32 | D07- |
| 15 | D08+ | 33 | D08- |
| 16 | D09+ | 34 | D09- |
| 17 | D10+ | 35 | D10- |
| 18 | D11+ | 36 | D11- |

■ Pin connection of "RS-232C" connector (OMRON XM2C-0912-111, 9-pin D-sub male connector)

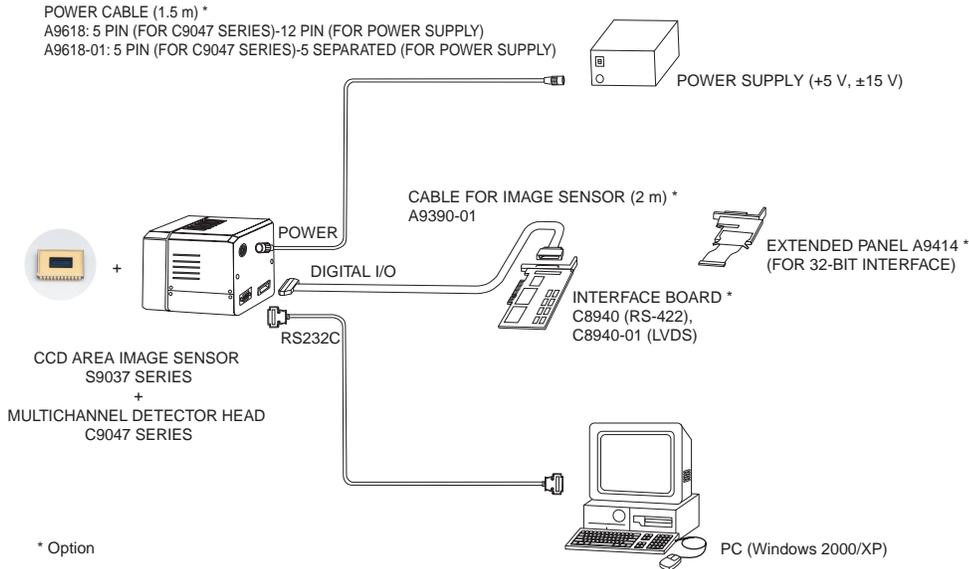
| Pin No. | Signal name | Pin No. | Signal name |
|---------|-------------|---------|-------------|
| 1 | NC | 6 | NC |
| 2 | RX | 7 | RTS |
| 3 | TX | 8 | CTS |
| 4 | NC | 9 | NC |
| 5 | GND | - | - |

■ Pin connection of "POWER" connector (HIROSE RM12BRD-5S, 5-pin female connector)

| Pin No. | Signal name |
|---------|-------------|
| 1 | D. +5 V |
| 2 | D. GND |
| 3 | A. +15 V |
| 4 | A. GND |
| 5 | A. -15 V |

■ Connection example

Refer to the drawing below to set up the hardware used in conjunction with this camera.



KACCC0210EC

HAMAMATSU

Information furnished by HAMAMATSU is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions. Specifications are subject to change without notice. No patent rights are granted to any of the circuits described herein. ©2007 Hamamatsu Photonics K.K.

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81) 53-434-3311, Fax: (81) 53-434-5184, www.hamamatsu.com

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, P.O.Box 6910, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 08152-3750, Fax: (49) 08152-2658

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: 33-(1) 69 53 71 00, Fax: 33-(1) 69 53 71 10

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777

North Europe: Hamamatsu Photonics Norden AB: Smidesvägen 12, SE-171 41 Solna, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01

Italy: Hamamatsu Photonics Italia S.R.L.: Strada della Moia, 1/E, 20020 Arese, (Milano), Italy, Telephone: (39) 02-935-81-733, Fax: (39) 02-935-81-741

Cat. No. KACC1086E02
Jan. 2007 DN