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 *1) 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

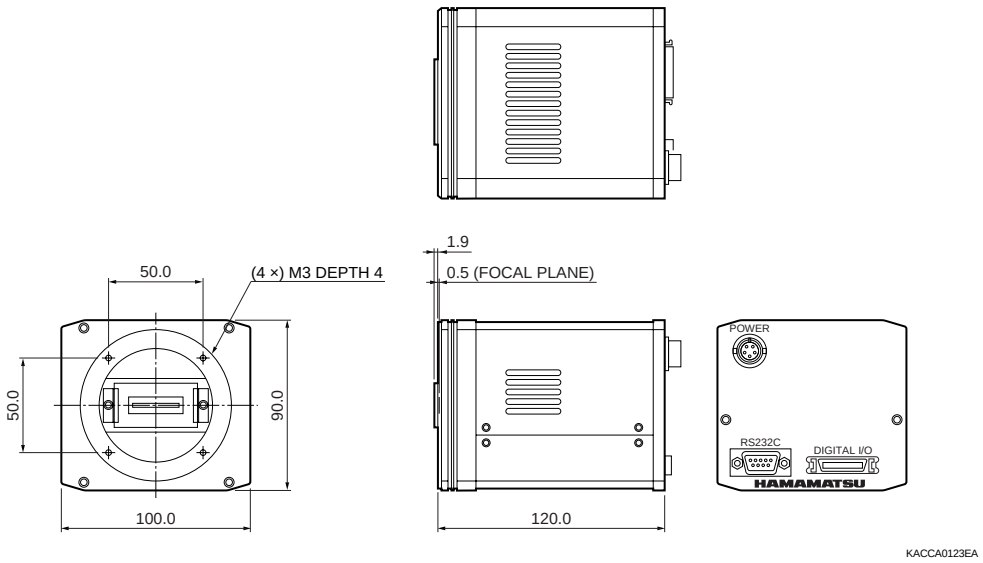
*1: When the CCD sensor faceplate is removed.

SOLID STATE DIVISION

■ 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)



■ 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)

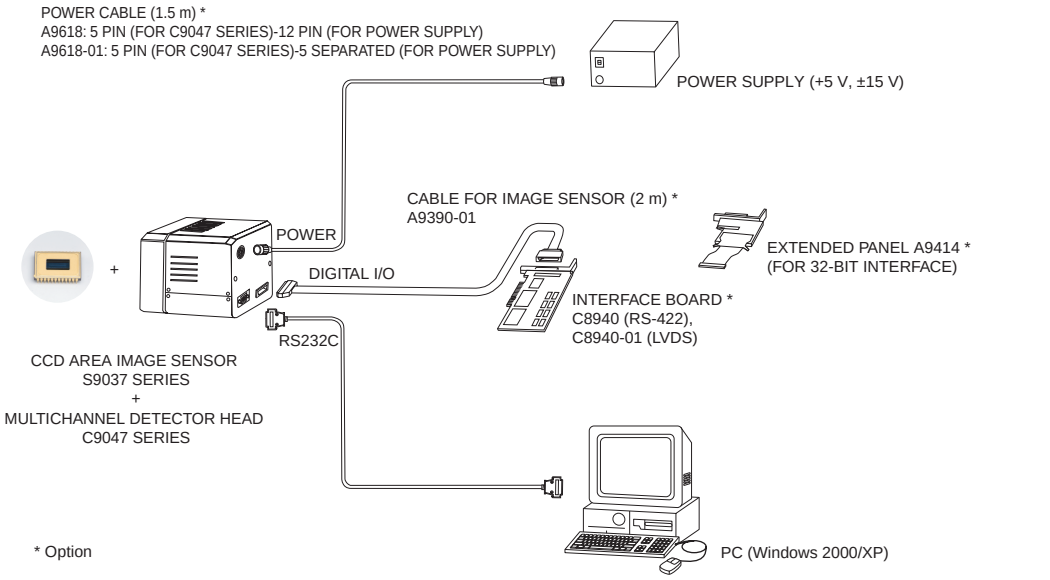
Pin No.	Signal name	Pin No.	Signal name
1	NC	6	NC
2	RX	7	RTS
3	TX	8	CTS
4	NC	9	NC
5	GND	-	-

■ 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.



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