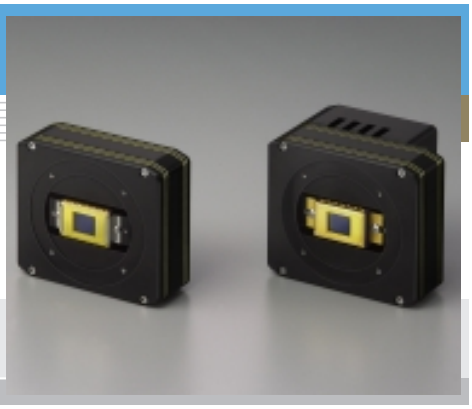
CCD multichannel detector head
C7180, C7181

Detector head for back-thinned CCD area image sensor



C7180 and C7181 are high-sensitivity multichannel detector heads designed for 512 × 512 pixel, back-thinned FFT-CCD area image sensors (S7170-0909, S7171-0909). C7180 works with non-cooled type back-thinned CCD area image sensor (S7170-0909) and C7181 with one-stage thermoelectrically cooled type (S7171-0909). Both C7180 and C7181 have a low noise driver/amplifier circuit that operates the CCD image sensor by input of simple external signals.
C7181 also includes a highly stable temperature controller that cools the sensor to a preset temperature level (Ts= -10 ˚C) as soon as the power is turned on. If the cooler fails and causes internal circuitry to overheat, the built-in protection circuit automatically turns off the power. Despite its compact size, the housing configuration is designed for good heat dissipation, and threaded mounting holes on the front panel allow connections to other devices such as monochrometers. As an option, Hamamatsu provides C7557 controller for multichannel detector heads. When used with the dedicated software installed into a PC, C7557 allows the PC to control the multichannel detector head and collect the data.

Features

- Designed for back-thinned CCD area image sensor *1
  C7180: for non-cooled type (S7170-0909)
  C7181: for TE-cooled type (S7171-0909)
- Choice of line binning operation*2/area scanning operation
- Built-in driver circuit
- Highly stable temperature controller (C7181)
  Cooling temperature: fixed at Ts= -10 ± 0.05 ˚C
  (Ta=10 to 35 ˚C)
- Operates with simple input signals
- High UV sensitivity and high quantum efficiency
- Compact configuration

Applications

- Scientific measurement instrument
- Semiconductor inspection
- UV imaging
- Biophoton observation

■ Selection guide

The table below shows CCD area image sensors applicable for C7180, C7181.
Since C7180, C7181 do not include a CCD area image sensor, so select the desired sensor and order it separately.

Type No.	CCD area image sensor				
	Type No.	Cooling	Number of pixels	Number of active pixels	Active area [mm (H) × mm (V)]
C7180	S7170-0909	Non-cooled	532 × 520	512 × 512	12.288 × 12.288
C7181	S7171-0909	One-stage TE-cooled	532 × 520	512 × 512	12.288 × 12.288

Note) Multichannel detector head C7182 designed for 512 × 512 pixel, two-stage TE-cooled CCD area image sensor (S7172-0909) is also available.

*1: In normal CCD image sensors that receive light from the front surface, the active area is covered with transparent electrodes for charge transfer. These electrodes cut off UV radiation incident on the image sensor and also reduce the quantum efficiency. In contrast, back-thinned CCD image sensors have a unique structure in which the back of the active area is finely ground to allow light to enter from the back surface. This structure ensures high UV sensitivity and quantum efficiency because incident light need not pass through the transparent electrodes.

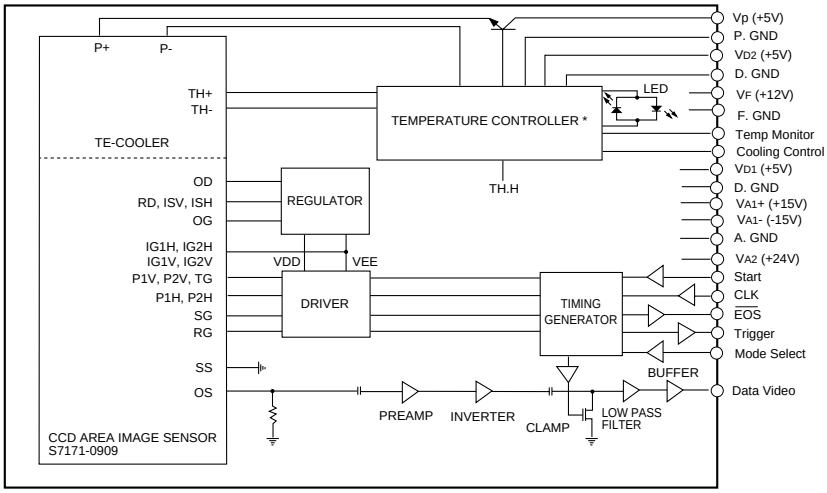
*2: The FFT-CCD was originally designed as a two-dimensional image sensor. However, it can be operated like a linear image sensor having a large active area by transferring all the pixel signals in the vertical direction to the horizontal register (this is referred to as line binning).

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■ Specifications (C7181)

·External input signal : HCMOS; clock signal, scan setting signal
·External control signal : HCMOS; gain switching, cooling ON/OFF
·Analog signal : video signal (0 to +10 V), cooling temperature display voltage (0 to 1.5 V)
·Power supply : +5 V, +/-15 V, +12 V, +24 V

■ Block diagram (C7181)

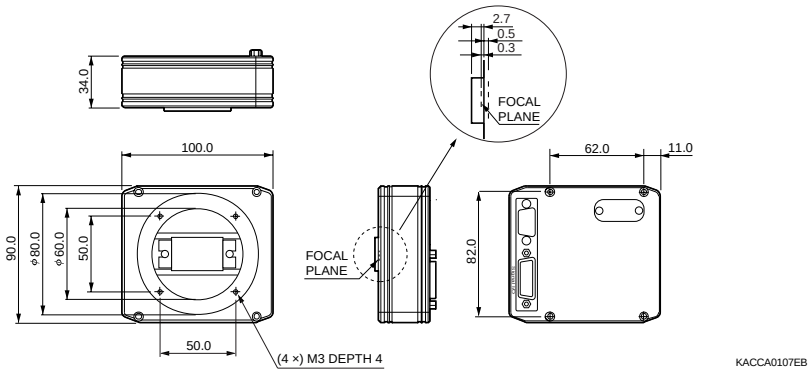


* C7180 does not include the temperature controller and TE-cooler.

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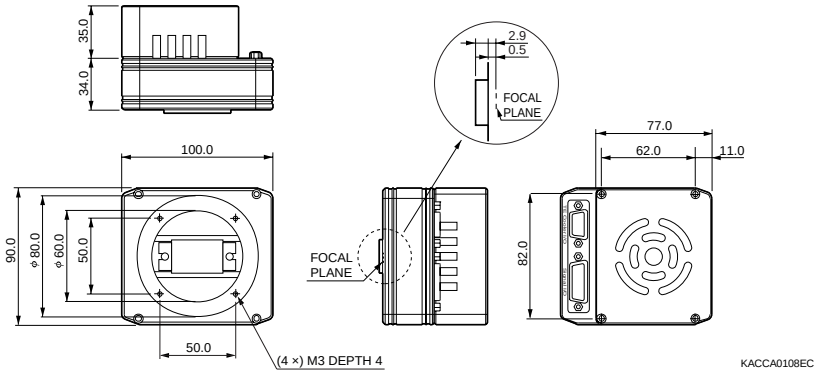
■ Dimensional outlines (unit: mm)

C7180



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C7181



KACCA0108EC

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