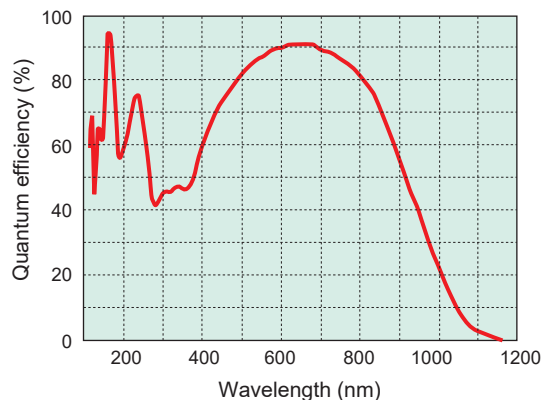


# BT-CCD camera C8000-30



The C8000-30 employs an ultrahigh-sensitivity back-thinned CCD sensor made by Hamamatsu, which offers extremely high quantum efficiency in a wide range of UV, VIS and NIR wavelengths. The high UV sensitivity from 120 nm is useful for semiconductor mask inspection and measurement applications. Also, the high NIR sensitivity is useful for fluorescence measurement, NIR LD measurement and so on.

## SPECTRAL RESPONSE



\* Without sapphire window. With the sapphire window, the spectral response is decreased due to the transmittance characteristics of the window.

## FEATURES

### High-sensitivity imaging from UV to near-infrared wavelengths

- UV: Quantum efficiency over 60 % (at 200 nm)
- Near-infrared: Quantum efficiency over 90 % (at 650 nm)

### Quantum efficiency in UV source (reference data)

(This is typical value)

| Light source                  | F <sub>2</sub> | ArF | KrF | Fourth harmonic generation of a YAG laser | i line |
|-------------------------------|----------------|-----|-----|---|--------|
| Wavelength (nm)               | 157            | 193 | 248 | 266                                       | 365    |
| Quantum efficiency (%) (typ.) | 84             | 57  | 69  | 50  | 47     |

\* UV light irradiation may cause a drop in sensitivity and increase the dark current of the CCD sensor.

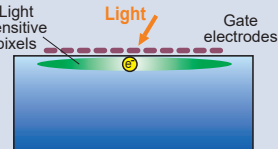
### Real time background subtraction

### Recursive filter (2, 4, 8, 16, 32 and 64 frames selectable)

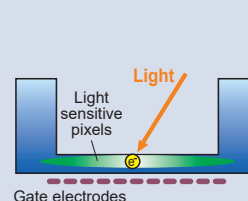
## PRINCIPLE

In a normal CCD with front-illuminated CCD structure, the light sensitive pixels have a charge transfer function as well, and this function requires the front surface of light sensitive pixels to be covered by a semi-transparent Poly-Si electrode for the charge transfer function. The Poly-Si electrode absorbs some percentage of incoming photons depending on their wavelength. Especially of the UV light is not able to reach the light sensitive pixels. To overcome this disadvantage, in a back-thinned CCD, the CCD is turned upside down and this back side of the CCD is thinned to 10-15 μm in thickness. Incident photons now enter the CCD from the back-thinned side, without the Poly-Si electrode in the light path. Then QE values of greater than 90 % can be achieved.

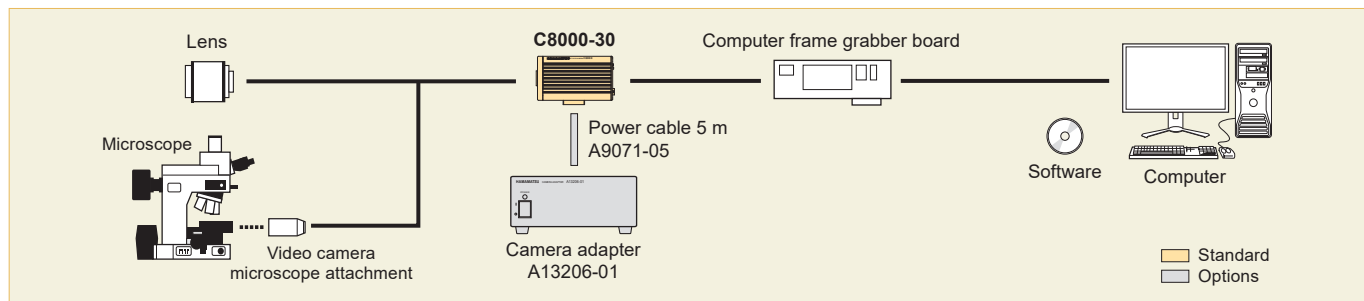
### Normal CCD (Front-Illuminated CCD)



### Back-Thinned CCD



## SYSTEM CONFIGURATION



## SYSTEM SPECIFICATIONS

|                                    |   |                |
|------------------------------------|---|----------------|
| Type number                        | <b>C8000-30</b>   |                |
| Imaging device                     | 2/3 inch Back-thinned frame transfer CCD                                |                |
| Effective number of pixels         | 640 (H) × 480 (V)   |                |
| Pixel size                         | 14 μm (H) × 14 μm (V)   |                |
| Effective area                     | 8.96 mm (H) × 6.72 mm (V)   |                |
| Frame rate                         | 1 × 1   | 31.4 frames/s  |
|                                    | 2 × 2   | 58.3 frames/s  |
|                                    | 4 × 4   | 101.8 frames/s |
| Readout noise (rms) (typ.)         | 150 electrons   |                |
| Full well capacity (typ.)          | 30 000 electrons  |                |
| Cooling method                     | Passive air-cooled Peltier cooling                                      |                |
| Cooling temperature                | + 5 °C Passive air-cooled (Ambient temperature : +20 °C)                |                |
| Digital output                     | 12 bit  |                |
| Exposure time                      | Internal trigger mode 30.8 ms to 1 s                                    |                |
| Analog gain                        | ×1 to ×5 (16 steps)   |                |
| Sub-array                          | Yes   |                |
| External trigger input mode        | Edge trigger, Level trigger, Start trigger, Synchronous readout trigger |                |
| Image processing functions         | Background subtraction, Recursive filter                                |                |
| Lens mount                         | C-mount   |                |
| Interface                          | Camera Link base configuration  |                |
| External control                   | Camera Link   |                |
| Power supply                       | DC +12 V  |                |
| Power consumption                  | Approx. 10 VA   |                |
| Ambient operating temperature      | 0 °C to + 40 °C   |                |
| Performance guaranteed temperature | 0 °C to + 30 °C   |                |
| Ambient storage temperature        | - 10 °C to + 50 °C  |                |
| Ambient operating humidity         | 70 % max. (with no condensation)  |                |
| Ambient storage humidity           | 90 % max. (with no condensation)  |                |

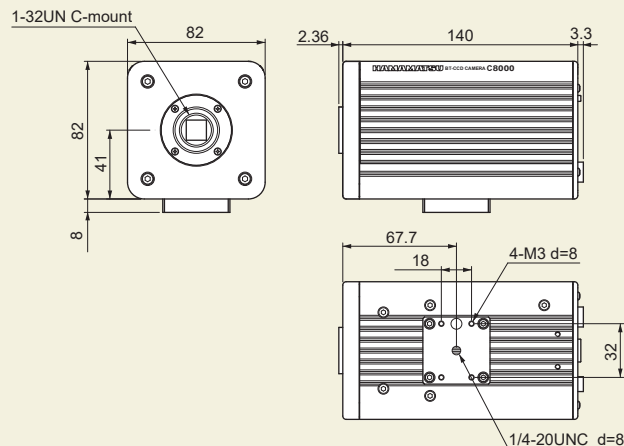
## OPTIONS

- Camera adapter : A13206-01
- Power cable 5 m : A9071-05

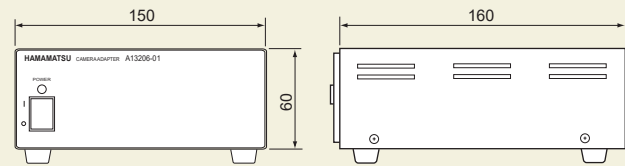
## DIMENSIONAL OUTLINES

(Unit: mm)

- Camera head (Approx. 1.3 kg)



- Camera adapter A13206-01 (Approx. 0.8 kg) (Option)



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