

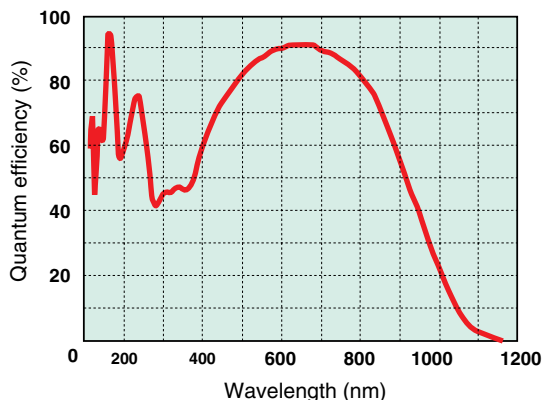
BT-CCD Camera C8000-30

Back-Thinned CCD Camera



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 ₂	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

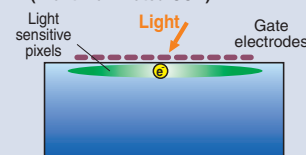
Recursive filter (2, 4, 8, 16, 32 and 64 frames selectable)

PRINCIPLE

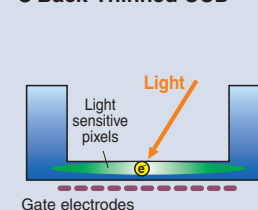
In a normal CCD with front-illuminated CCD structure, the light sensitive pixels have a charge transfer function as well, and this function requires the front surface of light sensitive pixels to be covered by a semi-transparent Poly-Si electrode for the charge transfer function. The Poly-Si electrode 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

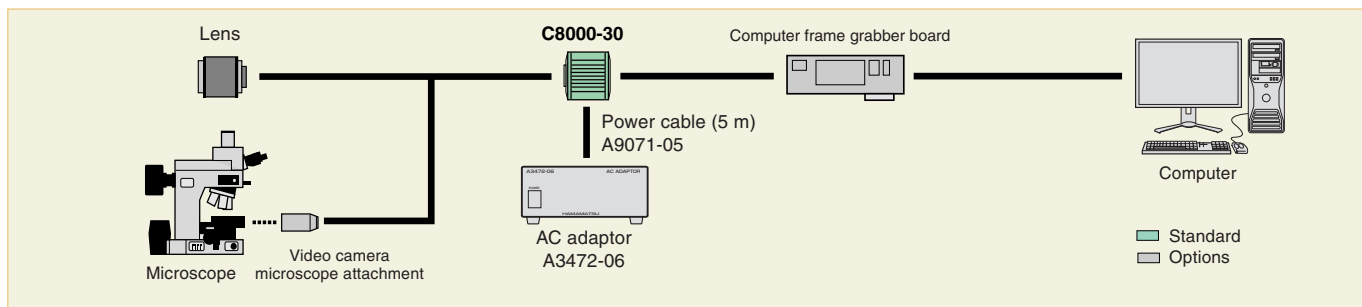
(Front-Illuminated CCD)



Back-Thinned CCD



SYSTEM CONFIGURATION



SYSTEM SPECIFICATIONS

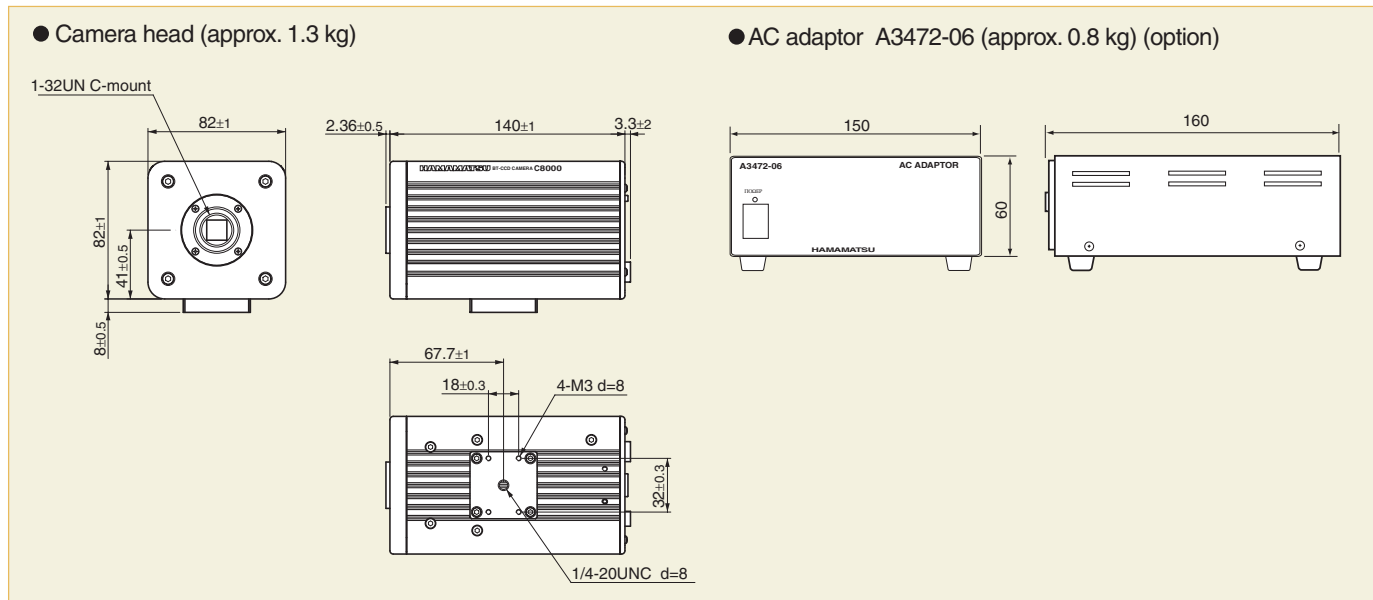
Type number	C8000-30		
Imaging device	Back-thinned frame transfer CCD		
Effective number of pixels	640 (H) × 480 (V)		
Cell size	14 μm (H) × 14 μm (V)		
Effective area	8.96 mm (H) × 6.72 mm (V)		
Frame rate	binning	1 × 1	31.4 frames/s
		2 × 2	58.3 frames/s
		4 × 4	101.8 frames/s
Readout noise (r.m.s.) (typ.)	150 electrons		
Full well capacity (typ.)	30 000 electrons		
Cooling method	Passive air-cooled		
Cooling temperature	+ 5 °C (room temperature + 20 °C)		
A/D converter	12 bit		
Exposure time	30.8 ms to 1 s		
Analog gain	Approx. 1 to 5 times (16 steps)		
Sub-array	8 pixels increments (V)		
External trigger mode	Edge trigger, Level trigger, Start trigger, Synchronous readout trigger		
Image processing functions	Background subtraction, Recursive filter		
Lens mount	C-mount		
Interface	CameraLink Base Configuration		
External control	CameraLink		
Power requirements	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

- AC adaptor: A3472-06
- Power cable (5 m): A9071-05

DIMENSIONAL OUTLINES

(Unit: mm)



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