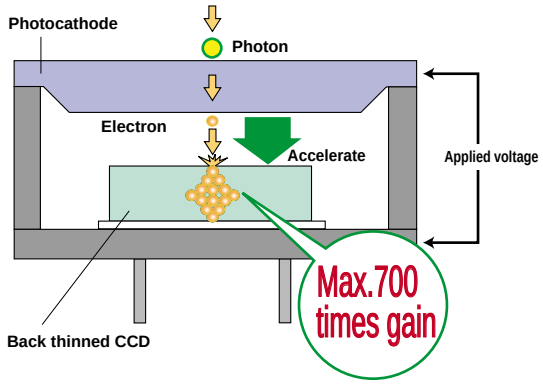
HAMAMATSU

DATA SHEET

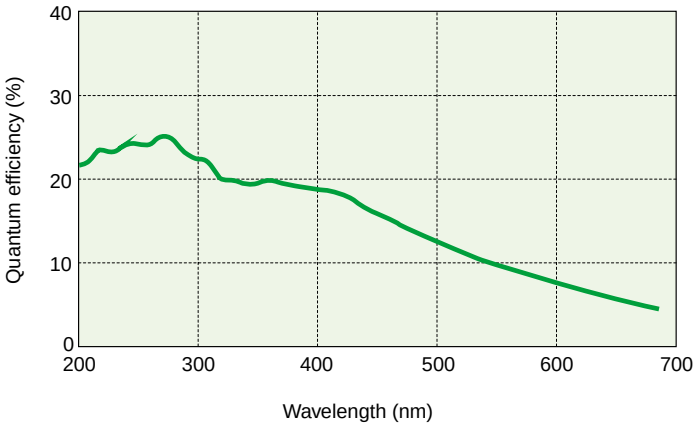
Electron Bombardment CCD Camera C7190-21

Hamamatsu EB-CCD cameras use an innovative high gain sensor that puts advanced technology to work to obtain high gain images in very low light. This technology involves a special vacuum chamber in which electrons generated at the photocathode are accelerated by a high potential into a newly developed, back thinned, back illunimated CCD. This direct bombardment of the CCD by accelerated electrons provides high gain, high resolution images, with none of the problems associated with Micro Channel Plates which are used in other devices. The sensor in the EB-CCD is driven by low noise circuits and features MPP (Multi Pin Phase) technology to achieve good S/N ratios at high gain conditions and a long service life.
Two different implementations of this technology are available. We offer a selection between a video rate camera with both analog and 10 bit digital output at 30 fps.

SENSOR STRUCTURE



SPECTRAL RESPONSE CHARACTERISTICS



* This is typical, not guaranteed.

FEATURES

- **High gain of up to 700 times**
- **High sensitivity in UV region**
  (Quantum efficiency: over 20 % at 250nm (typ.))
- **Frame rate : Non-interlace 30 Hz**
- **High S/N Ratio**
- **Contrast enhancement**

APPLICATIONS

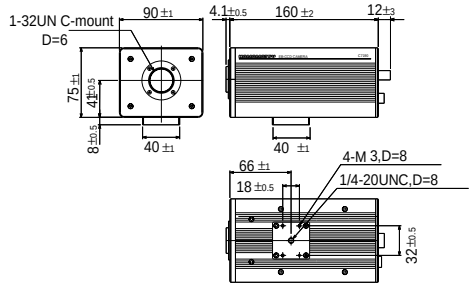
- **Excimer (KrF*) laser beam diagnostics**
  (*Wavelength of KrF Excimer laser : 248 nm)
- **Semiconductor mask alignment**
- **Intra-cellular ion concentration measurements (Ca^{2+}, pH, etc.)**
- **Observation of fluorescence-stained samples**
- **Fluorescence photobleaching recovery**

SPECIFICATIONS

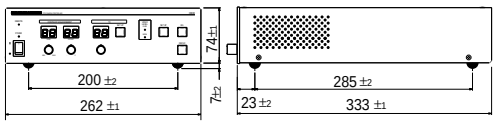
Type. number	C7190-21
CCD structure	Back thinned frame transfer CCD
Total no. of pixels	680 (H) × 1000 (V)
Effective no. of pixels	658 (H) × 490 (V)
Cell size	14 µm (H) × 14 µm (V)
Effective area	8.96 mm (H) × 6.72 mm (V) / 2/3-inch format
Full well capacity	65000 electrons (typ.)
Frame rate	Non-interlace 30 Hz
A/D converter	10 bit
Gain	600 to 700 times
Sensitivity control	Possible
Cooling temperature	Ambient temperature
Photocathode	S-20
Sensor structure	Proximity focused type
Data output	RS-170A out and RS-644 digital out
Camera controller	RS-232C
Contrast enhancement	Possible
Real time background subtraction	Possible (RS-170 A out only)
Recursive filter (2, 4, 8, 16, 32, 64 frame selectable)	Possible (RS-170 A out only)

DIMENSIONAL OUTLINES (Unit: mm)

- Camera head (approx. 1.4 Kg)



- Camera controller (approx. 4.6 Kg)



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