HAMAMATSU
PHOTON IS OUR BUSINESS

Infrared detector modules with preamp

Thermoelectrically cooled types

Easy-to-use detector modules with built-in preamps

Infrared detector modules operate just by connecting to DC power supplies. Low noise thermoelectric cooled types using InGaAs, InAs or InAsSb elements are available. We welcome requests for custom devices that suit your application.

Features

- **High S/N**
- **Compact size**
- **Easy to use**
  Operates just by connecting to DC power supply
- **Circuit design optimized for detector characteristics**
- **Built-in temperature control circuit (TE-cooled type)**

Applications

- **Infrared detection**

Accessories

- **6-conductor cable for TE-cooled type**
  (for DC power supply): 2 m (with one side connector)
  A4372-07
- **Instruction manual**

Structure

Type no.	Detector element	Cooling	Window material	Photosensitive area (mm)	Supply voltage	
					Vcc*1 (V)	Vp*1 (V)
C12483-250	InGaAs (G12180-250A)	Two-stage TE-cooled	AR coated (1.55 µm peak) borosilicate glass	ϕ5	±15 ± 0.5	$+2.5^{+0.5}_{-0.1}$
C12485-210	InGaAs (G12182-210K)		Borosilicate glass	ϕ1		
C12486-210	InGaAs (G12183-210K)					
C12492-210	InAs (P10090-21)		Sapphire glass	2 × 2		
C12494-222S	InAsSb (P13243-222MS)					
C12494-210S	InAsSb (P11120-201)			ϕ1		
C12494-210M	InAsSb (P12691-201G)		AR coated Ge			
C12494-211L	InAsSb (P13894-211MA)			1 × 1		

*1: Vcc=power supply for circuit, Vp=power supply for cooling

Absolute maximum ratings

Type no.	Incident light level*2 (μW)	Supply voltage		Operating temperature*3 Topr (°C)	Storage temperature*3 Tstg (°C)
		Vcc (V)	Vp (V)		
C12483-250	0.2	±18	+5	0 to +40	-20 to +50
C12485-210	0.06				
C12486-210	0.07				
C12492-210	2.6				
C12494-222S	14 mW				
C12494-210S	26				
C12494-210M					
C12494-211L	28 mW				

*2: The value at which the output voltage of each module is maximized when light with the maximum sensitivity wavelength λp enters the device. This value does not cause immediate failure.
However, if light that destroys the device (1 W/mm^2 for all elements) enters the device, it may cause a drop in product quality.
*3: No dew condensation
When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Optical characteristics (Typ. Ta=25 °C, unless otherwise noted)

Type no.	Chip temperature at rated supply voltage Tchip (°C)	Peak sensitivity wavelength λp (μm)	Cutoff wavelength λc (μm)	Photosensitivity*4 S λ=λp		Noise equivalent power NEP λ=λp	
				Min. (V/W)	Typ. (V/W)	Typ. (W/Hz$^{1/2}$)	Max. (W/Hz$^{1/2}$)
C12483-250	-15	1.55	1.66	3.3×10^7	5.8×10^7	5.2×10^{-14}	7×10^{-13}
C12485-210		1.95	2.05	1.1×10^8	1.8×10^8	1×10^{-13}	3×10^{-12}
C12486-210		2.3	2.56	1×10^8	2×10^8	4×10^{-13}	6×10^{-12}
C12492-210	-28	3.25	3.45	0.8×10^7	1×10^7	6×10^{-12}	1×10^{-11}
C12494-222S		4.1	5.1	5×10^2	7×10^2	8×10^{-10}	1.2×10^{-9}
C12494-210S		4.9	5.9	5×10^5	7.5×10^5	1×10^{-10}	3×10^{-10}
C12494-210M		6.7	8.3				
C12494-211L		5.6	10.2	$2.5 \times 10^{2*5}$	$3.5 \times 10^{2*5}$	1.5×10^{-9}	4.5×10^{-9}

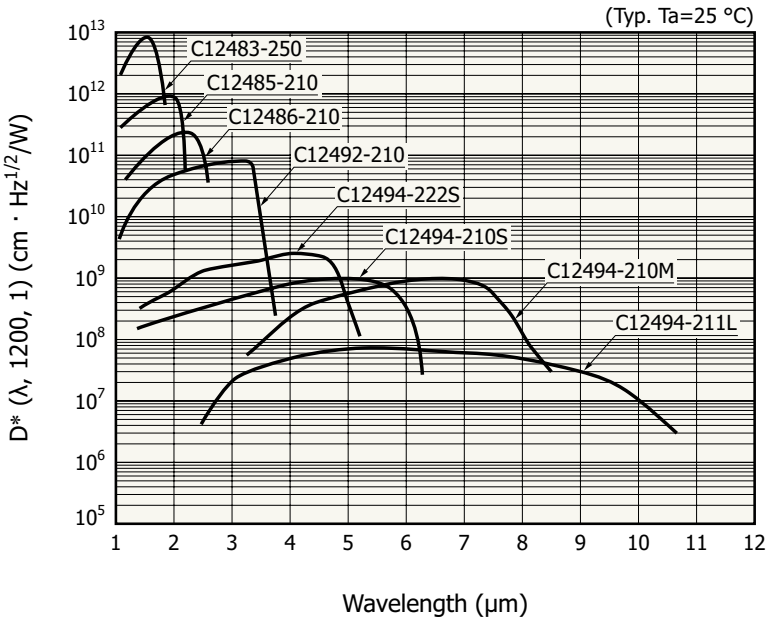
*4: f=100 Hz (C12483-250, C12485-210, C12486-210), f=1.2 kHz (C12492-210, C12494-210S/-210M), f=600 Hz (C12494-211L/-222S)
*5: Uniform irradiation on the entire photosensitive area.

Electrical characteristics (Typ. Ta=25 °C, unless otherwise noted)

Type no.	Frequency response -3 dB (Hz)			Output impedance (Ω)	Maximum output voltage RL=1 kΩ (V)	Current consumption*6			
	FcL	FcH				Vcc		Vp	
	Typ.	Min.	Typ.			Typ. (mA)	Max. (mA)	Typ. (mA)	Max. (mA)
C12483-250	DC	900	1.1 k	50	+10	+30, -22	+50, -30	+500	+1100
C12485-210	DC	1.5 k	2.2 k			+30, -13	+60, -30		
C12486-210	DC	2.1 k	3 k			+30, -14			
C12492-210	5	40 k	50 k		±13	+30, -14	+80, -30	+600	
C12494-222S	DC	750 k	1 M		+10	+30, -20			
C12494-210S	5	80 k	100 k		±13				
C12494-210M									
C12494-211L	DC	750 k	1 M		+10			+500	

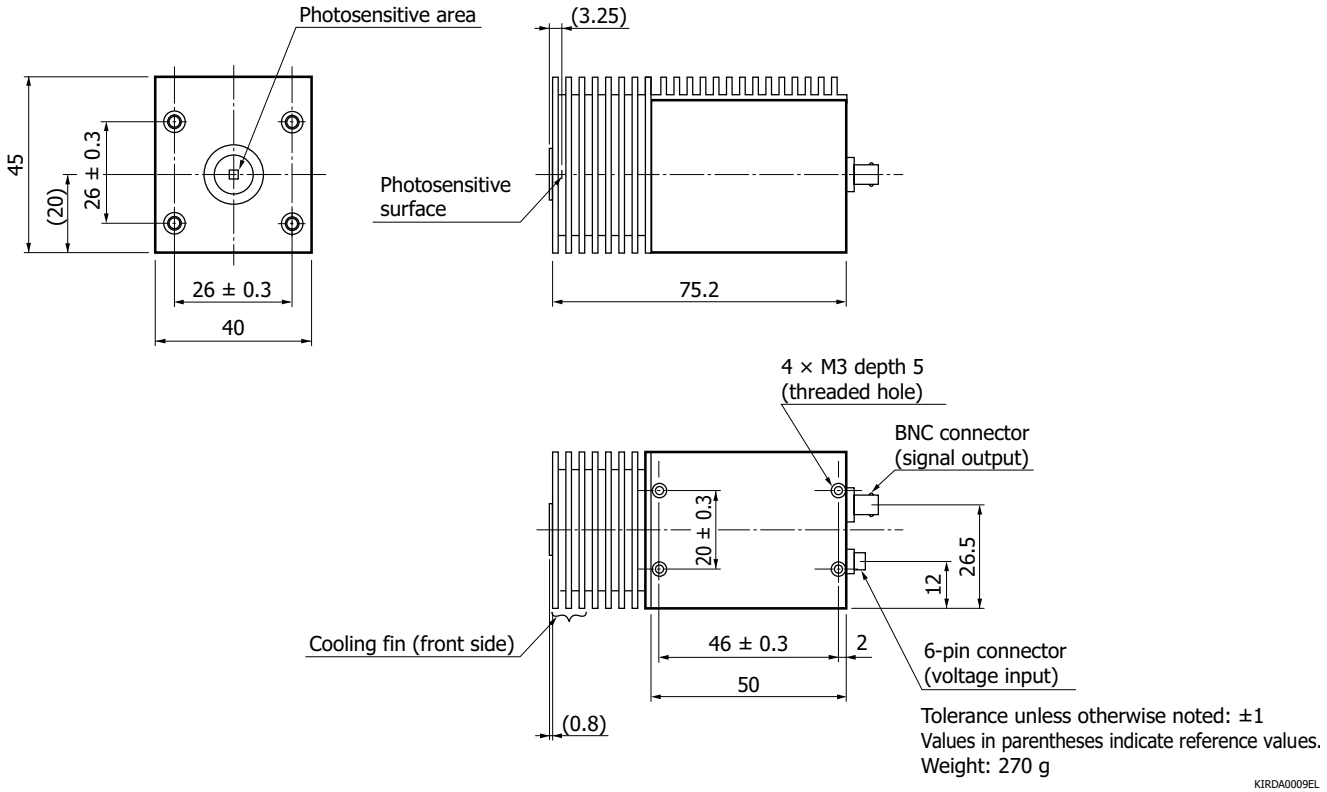
*6: Vcc=±15 V, Vp=2.5 V (C12485-210, C12486-210, C12483-250, C12492-210, C12494-210S/-222S/-210M/-211L)
Recommended DC power supply (analog power supply): PW18-1.3ATS (TEXIO Technology), E3630A (Keysight Technologies)
Current capacity: More than 1.5 times the maximum current consumption
Ripple noise: 5 mVp-p or less (±15 V, +2.5 V power supply)

Spectral response

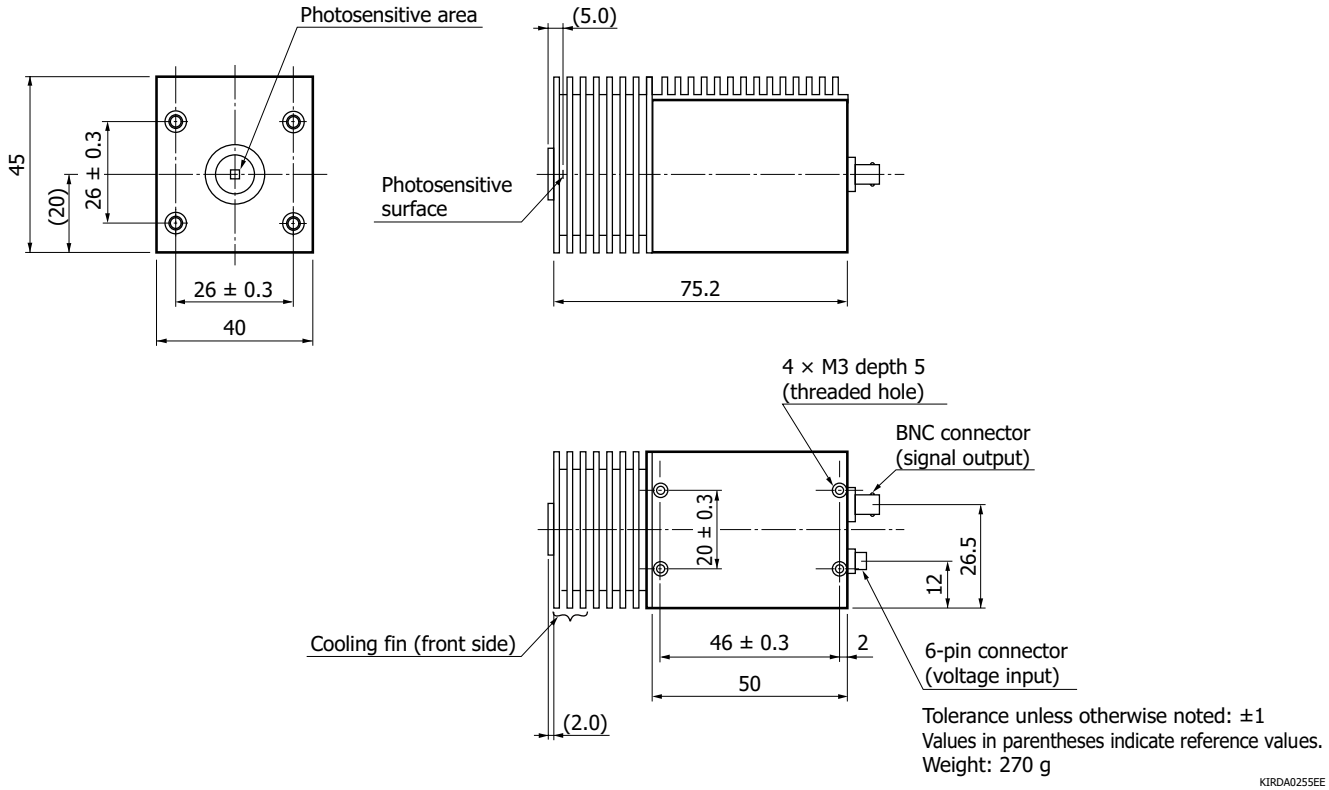


Dimensional outlines (unit: mm)

C12485-210, C12486-210, C12483-250, C12492-210, C12494-210S/-222S/-211L



C12494-210M

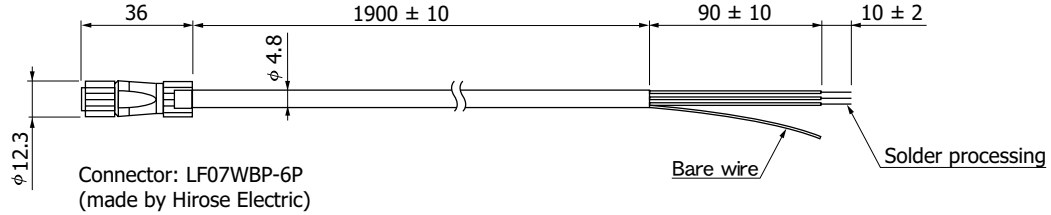


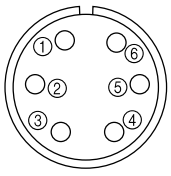
Tolerance unless otherwise noted: ±1
Values in parentheses indicate reference values.
Weight: 270 g

KIRDA0255EE

Note: The cooling fin (front side) is removable.

6-conductor cable (for DC power supply) A4372-07





Connector

Pin no.	Pin connection	Lead color
①	+2.5 V Power supply for cooling controller	Red
②	GND Power supply for cooling controller	Blue
③	Output for temperature monitor	Light green
④	+15 V	Yellow
⑤	-15 V	White
⑥	GND	Black

Note: The bare wire is for GND of the case.

Tolerance unless otherwise noted: ±1

KIRDA0241EC

Precautions

· Always use a dual-polarity ±15 V or ±2.5 V power supply to operate this detector. Never use a single-polarity power supply. Using a single-polarity power supply may cause the amplifier in the detector module to break down.
· Regarding TE-cooled type, always supply +2.5 V to cool the detector element.
· Be careful not to apply excessive force to the detector surface. Applying excessive force may damage the light input window. Do not directly touch the light input window with bare hands. If dust or dirt gets on the window, wipe it gently using ethyl alcohol.
· Do not drop this product or do not apply excessive shock to it.

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions
· Disclaimer
· Safety consideration / Opto-semiconductors
· Precautions / Compound opto-semiconductors (photosensors, light emitters)

■ Catalogs
· Selection guide / Infrared detectors
· Technical note / Compound semiconductor photosensors

HAMAMATSU www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Solid State Division
1126-1 Ichino-cho, Chuo-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81)53-434-3311, Fax: (81)53-434-5184
U.S.A.: HAMAMATSU CORPORATION: 360 Foothill Road, Bridgewater, NJ 08807, U.S.A., Telephone: (1)908 231 0960, Fax: (1)908 231 1218
Germany: HAMAMATSU PHOTONICS DEUTSCHLAND GMBH: Arzbergerstr. 10, 82211 Herrsching am Ammersee, Germany, Telephone: (49)8152 375 0, Fax: (49)8152 265 8 E mail: info@hamamatsu.de
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 E mail: infos@hamamatsu.fr
United Kingdom: HAMAMATSU PHOTONICS UK LIMITED: 2 Howard Court,10 Tewin Road, Welwyn Garden City, Hertfordshire, AL7 1BW, UK, Telephone: (44)1707 294888, Fax: (44)1707 325777 E mail: info@hamamatsu.co.uk
North Europe: HAMAMATSU PHOTONICS NORDEN AB: Torshamnsgatan 35, 16440 Kista, Sweden, Telephone: (46)8 509 031 00, Fax: (46)8 509 031 01 E mail: info@hamamatsu.se
Italy: HAMAMATSU PHOTONICS ITALIA S.R.L.: Strada della Moia, 1 int. 6 20044 Arese (Milano), Italy, Telephone: (39)02 93 58 17 33, Fax: (39)02 93 58 17 41 E mail: info@hamamatsu.it
China: HAMAMATSU PHOTONICS (CHINA) CO., LTD.: 1201, Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R. China, Telephone: (86)10 6586 6006, Fax: (86)10 6586 2866 E mail: hpc@hamamatsu.com.cn
Taiwan: HAMAMATSU PHOTONICS TAIWAN CO., LTD.: 13F 1, No.101, Section 2, Gongdao 5th Road, East Dist., Hsinchu City, 300046, Taiwan(R.O.C) Telephone: (886)3 659 0080, Fax: (886)3 659 0081 E mail: info@hamamatsu.com.tw

Cat. No. KIRD1036E38 Mar. 2025 DN