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 NEW	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 (μW)	Supply voltage Vcc (V)	Supply voltage Vp (V)	Operating temperature*2 Topr (°C)	Storage temperature*2 Tstg (°C)
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 NEW	14 mW				
C12494-210S	26				
C12494-210M					
C12494-211L	28 mW				

*2: 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*3 S λ=λp Min. (V/W)	Photosensitivity*3 S λ=λp Typ. (V/W)	Noise equivalent power NEP λ=λp Typ. ($W/Hz^{1/2}$)	Noise equivalent power NEP λ=λp 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 NEW		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	2.5×10^{2}*4	3.5×10^{2}*4	1.5×10^{-9}	4.5×10^{-9}

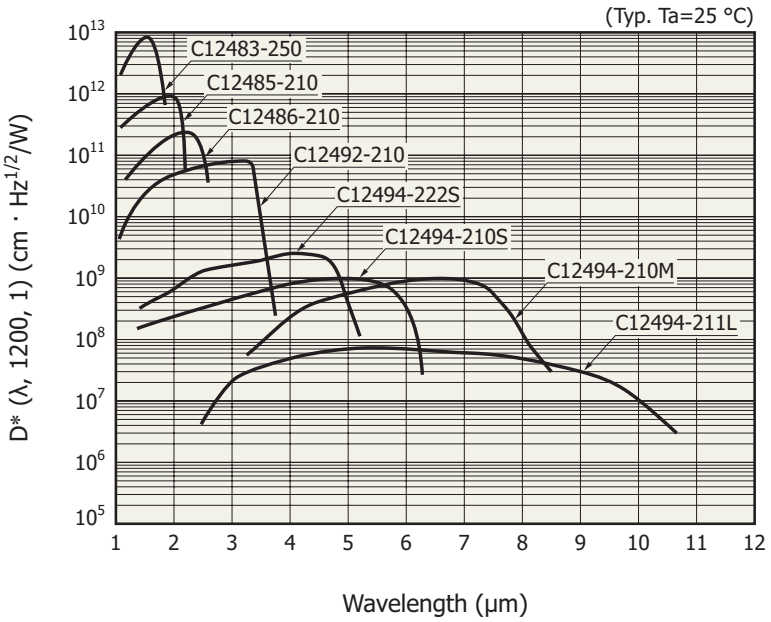
*3: f=100 Hz (C12483-250, C12485-210, C12486-210), f=1.2 kHz (C12492-210, C12494-210S/-210M), f=600 Hz (C12494-211L/-222S)
*4: Uniform irradiation on the entire photosensitive area.

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

Type no.	Frequency response -3 dB (Hz) FcL Typ.	Frequency response -3 dB (Hz) FcH Min.	Frequency response -3 dB (Hz) FcH Typ.	Output impedance (Ω)	Maximum output voltage RL=1 kΩ (V)	Current consumption*5 Vcc Typ. (mA)	Current consumption*5 Vcc Max. (mA)	Current consumption*5 Vp Typ. (mA)	Current consumption*5 Vp 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, -20	+80, -30	+600	
C12494-222S NEW	DC	750 k	1 M		+10				
C12494-210S	5	80 k	100 k		±13				
C12494-210M									
C12494-211L	DC	750 k	1 M		+10			+500	

*5: 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



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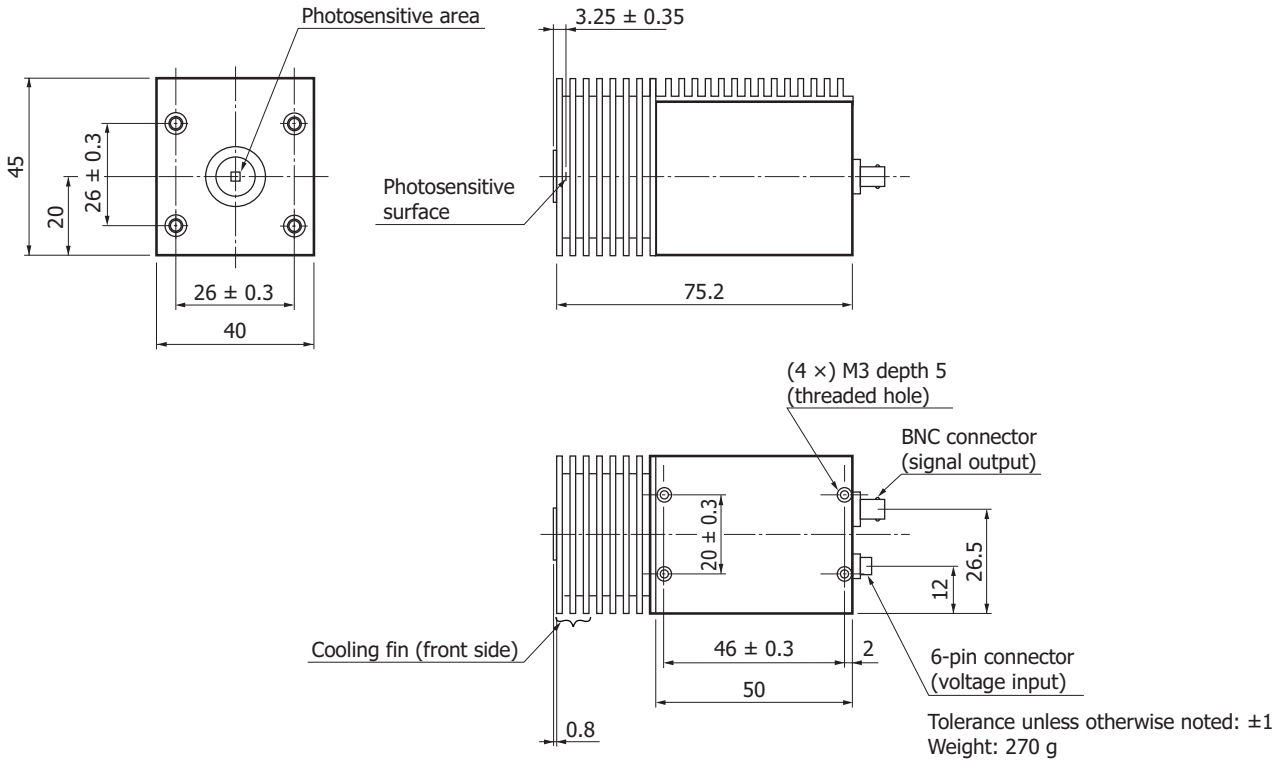
Dimensional outlines (unit: mm)

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



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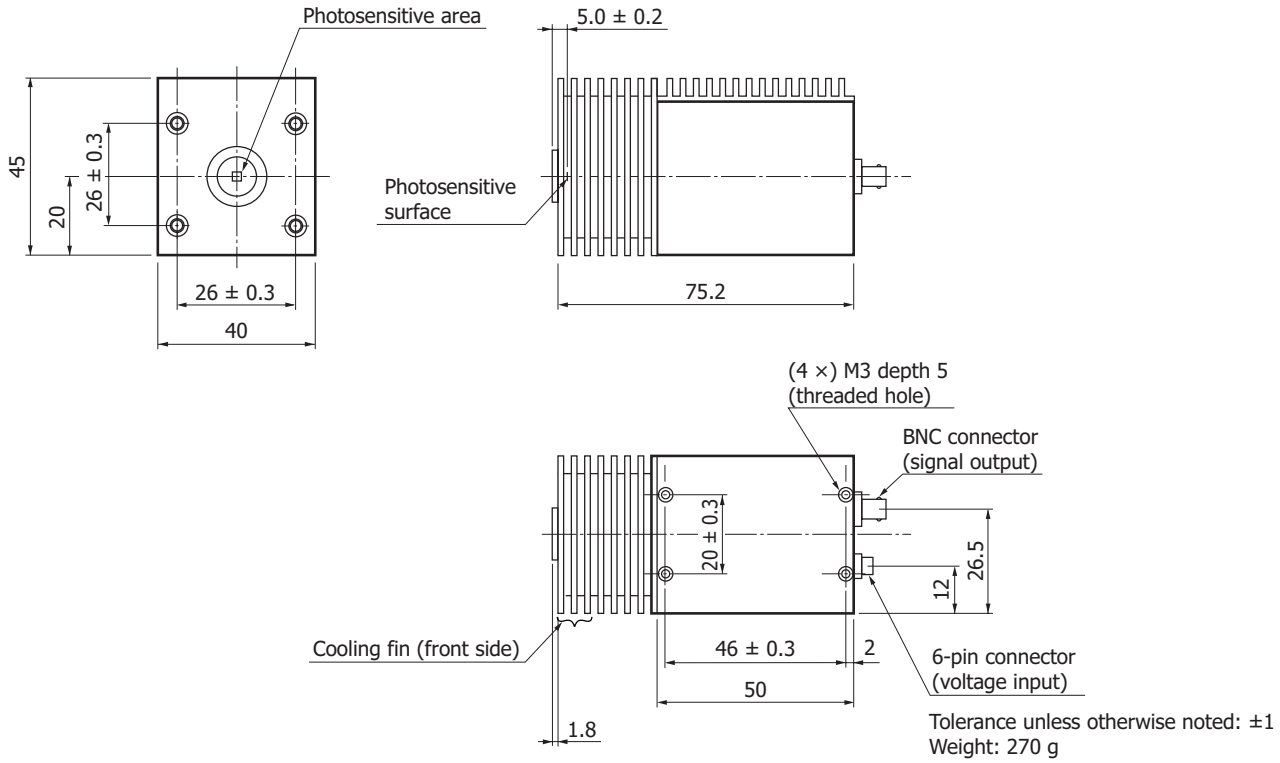
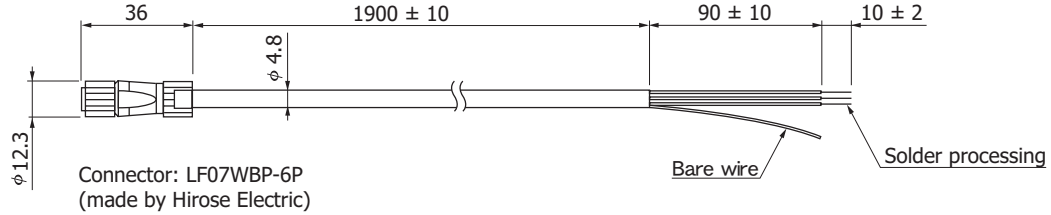
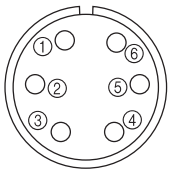
C12494-210M



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

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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
· Compound opto-semiconductors (photosensors, light emitters)

■ Technical note
· Compound semiconductor photosensors

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