HAMAMATSU
PHOTON IS OUR BUSINESS

Infrared detector modules with preamp

Thermoelectrically cooled type

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

Infrared detector modules operate just by connecting to DC power supplies. The detector element is selectable from among InGaAs, PbS, PbSe, and InSb, which are all combined with a thermoelectric cooler. 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 thermoelectric cooling control circuit (fixed control temperature)**

Applications

- **Infrared detection**

Accessories

- **Cable (for DC power supply): 2 m (connector installed at one end)**
  A4372-03: P4638, P4639, P4631-03
  A4372-07: C12485-210, C12486-210, C12483-250
- **Instruction manual**

Structure / Absolute maximum ratings

Type no.	Detector element	Window material	Photosensitive area (mm)	Supply voltage		Absolute maximum ratings				
				V+, V- (V)	Vp (V)	Incident light level max. (μW)	Supply voltage V+, V- (V)	Supply voltage Vp (V)	Operating temperature*1 Topr (°C)	Storage temperature*1 Tstg (°C)
C12485-210	InGaAs (G12182-210K)	Borosilicate glass	ϕ1	±15 ± 0.5	$+2.5^{+0.5}_{-0.1}$	0.06	±18	+5	0 to +40	-20 to +50
C12486-210	InGaAs (G12183-210K)		ϕ1			0.07				
C12483-250	InGaAs (G12180-250A)	AR coated (1.55 μm peak) Borosilicate glass	ϕ5			0.2				
P4638	PbS (P2682-01)	Sapphire glass	4 × 5		$+2.5^{+1}_{-0.05}$	0.25				
P4639	PbSe (P9696-203)		3 × 3			100				
P4631-03	InSb (P6606-310)		1 × 1		+4.5 ± 0.25	67		+7		

*1: No dew condensation
When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

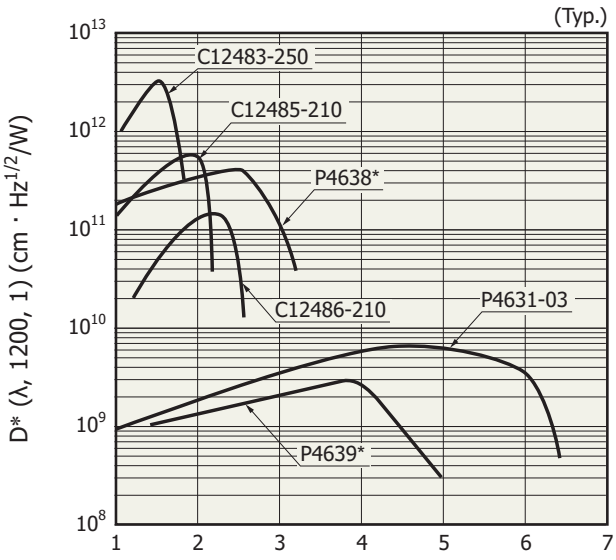
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

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

Type no.	Element temperature at rated input voltage Td (°C)	Peak sensitivity wavelength λp (μm)	Cutoff wavelength λc (μm)	Photosensitivity S λ=λp *2 Min. (V/W)	Photosensitivity S λ=λp *2 Typ. (V/W)	Noise equivalent power NEP λ=λp Typ. (W/Hz$^{1/2}$)	Noise equivalent power NEP λ=λp Max. (W/Hz$^{1/2}$)	Frequency response -3 dB (Hz) FcL Typ.	FcL Max.	FcH Min.	FcH Typ.	Output impedance (Ω)	Maximum output voltage RL=1 kΩ (V)	Current consumption*3 V+, V- Typ. (mA)	Current consumption*3 V+, V- Max. (mA)	Current consumption*3 Vp Typ. (mA)	Current consumption*3 Vp Max. (mA)
C12485-210	-15	1.95	2.05	1.1 × 10^8	1.7 × 10^8	1 × 10^{-12}	3 × 10^{-12}	DC	-	1.5 k	2.2 k	50	+10	+30, -10	+60, -30	+500	+1100
C12486-210		2.3	2.56	1.0 × 10^8	1.5 × 10^8	6 × 10^{-13}	6 × 10^{-12}	DC	-	2.1 k	3 k			+30, -10	+60, -30		
C12483-250		1.55	1.66	3.3 × 10^7	5.0 × 10^7	7 × 10^{-14}	7 × 10^{-13}	DC	-	900	1.2 k			+35, -15	+50, -30		
P4638		2.4	3.1	4.0 × 10^7	8.0 × 10^7	1 × 10^{-12}	2 × 10^{-12}	0.2	0.4	150	300		±13	+25, -15	+50, -20		
P4639		4.1	5.0	1.3 × 10^5	2.0 × 10^5	1 × 10^{-10}	2 × 10^{-10}	0.2	0.4	8 k	10 k			+25, -15	+50, -20		
P4631-03	-58	5.5	6.1	1.2 × 10^5	1.5 × 10^5	1.5 × 10^{-11}	6 × 10^{-11}	DC	-	80 k	100 k		+10	+75, -20	+90, -30	+950	

*2: f=100 Hz (C12485-210, C12486-210, C12483-250, P4638), f=600 Hz (P4639), f=1.2 kHz (P4631-03)
*3: V+=15 V, V-=-15 V, Vp=2.5 V (C12485-210, C12486-210, C12483-250, P4638, P4639), V+=15 V, V-=-15 V, Vp=4.5 V (P4631-03)
Recommended DC power supply (analog power supply): E3630A (Agilent Technologies)
Current capacity: More than 1.5 times the maximum current consumption
Ripple noise: 5 mVp-p or less (±15 V power supply)
5 mVp-p or less (+2.5 V, +4.5 V power supply)

Spectral response



* (λ, 600, 1)

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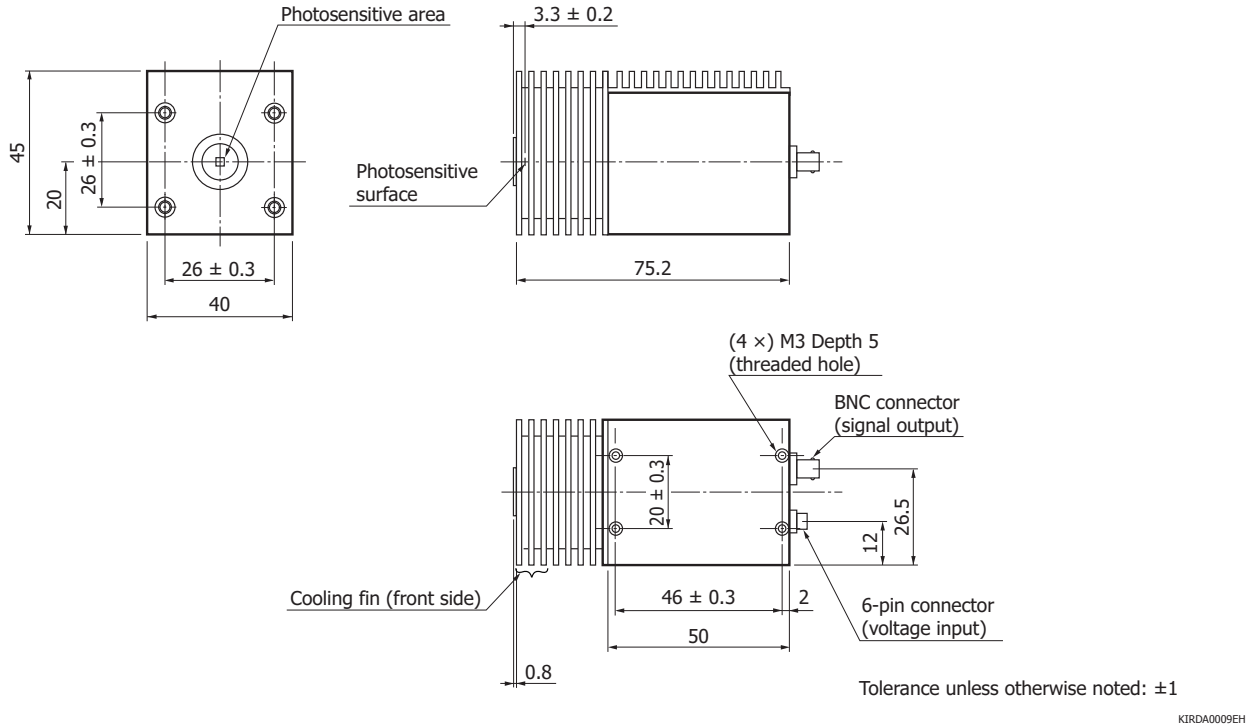
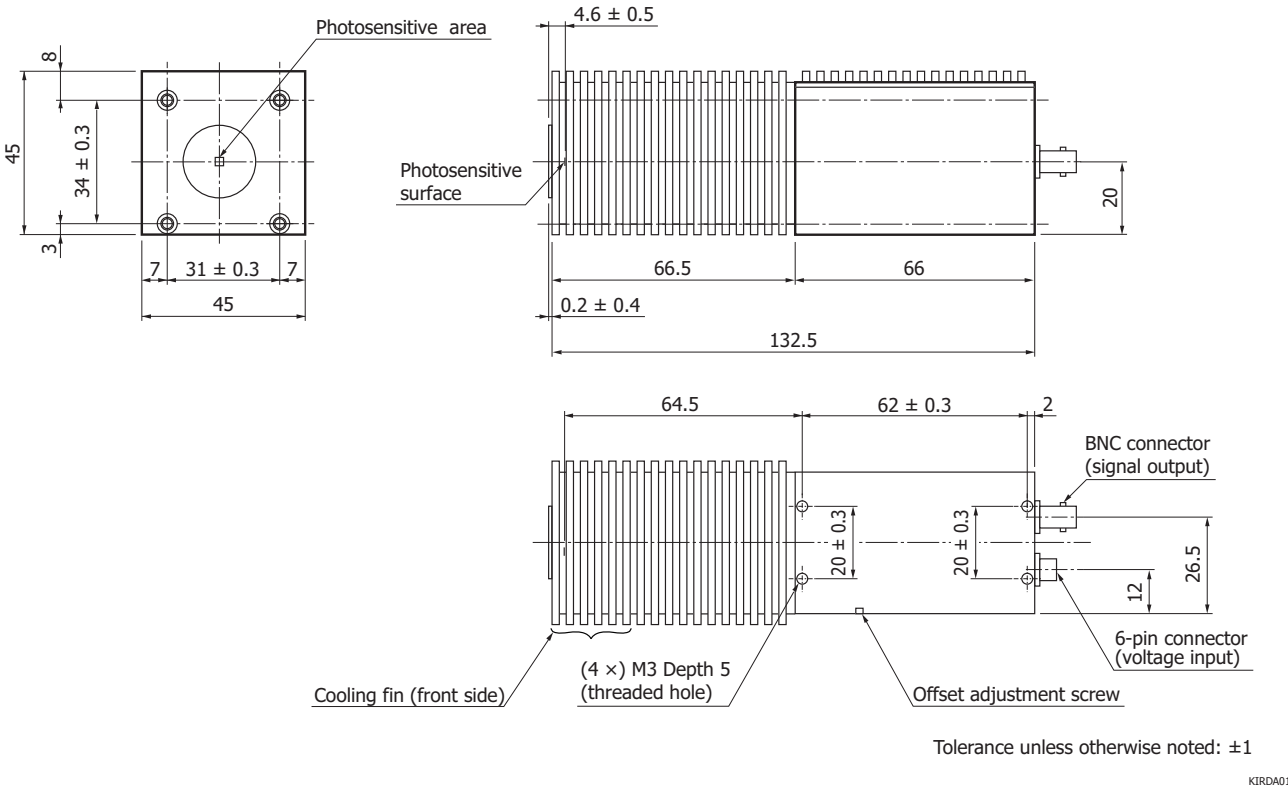
Dimensional outlines (unit: mm)

C12485-210, C12486-210, C12483-250, P4638, P4639

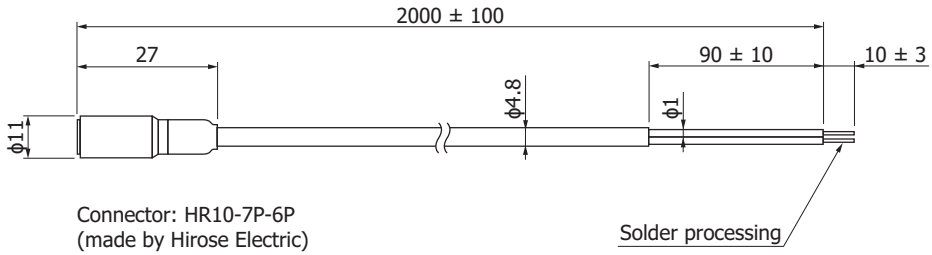


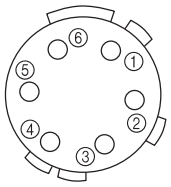
P4631-03



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

Cable (for DC power supply) A4372-03





Connector

Pin no.	Pin connection	Lead color
①	+2.5 V (or +4.5 V) Power supply for cooling controller	Red
②	GND Power supply for cooling controller	Blue
③	Output for temperatures monitor	Light green
④	+15 V	Yellow
⑤	-15 V	White
⑥	GND	Black stranded wire

Tolerance unless otherwise noted: ±1

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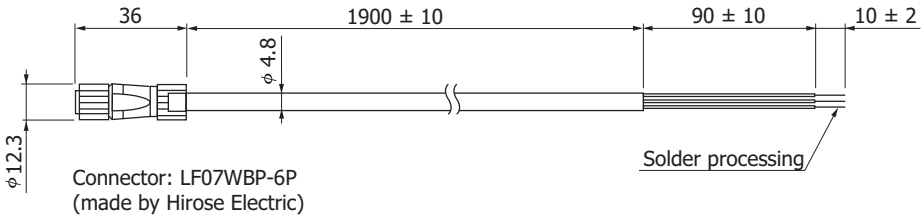
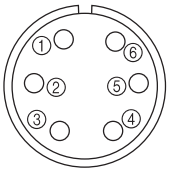
Cable (for DC power supply) A4372-07





Connector

Pin no.	Pin connection	Lead color
①	+2.5 V or +4.5 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

Tolerance unless otherwise noted: ±1

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Precautions

- Always use a dual-polarity (±15 V) power supply to operate this detector. Never use a single-polarity (+15 V or -15 V only) power supply. Using a single-polarity power supply may cause the amplifier in the detector module to break down.
- Always supply +2.5 V or +4.5 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

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

■ Precautions
- Disclaimer

■ Technical information
- Infrared detectors

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