HAMAMATSU
PHOTON IS OUR BUSINESS

Infrared detector modules with preamp

Non-cooled and 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, InSb 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

- **4-conductor cable for non-cooled type (for DC power supply):**
  2 m (with one side connector)
  A4372-02: G6121, C12494-011LH
- **6-conductor cable for TE-cooled type (for DC power supply):**
  2 m (with one side connector)
  A4372-03: P4631-03
  A4372-07: C12485-210, C12486-210, C12483-250,
  C12492-210, C12494-210S/-210M/-211L
- **Instruction manual**

Structure

Type no.	Detector element	Cooling	Window material	Photosensitive area (mm)	Supply voltage	
					Vcc*1 (V)	Vp*1 (V)
G6121	InGaAs (G8370-05)	Non-cooled	AR coated (1.55 µm peak) borosilicate glass	ϕ5	±15 ± 0.5	-
C12483-250	InGaAs (G12180-250A)	Two-stage TE-cooled				$+2.5^{+0.5}_{-0.1}$
C12485-210	InGaAs (G12182-210K)	Two-stage TE-cooled	Borosilicate glass	ϕ1		$+2.5^{+0.5}_{-0.1}$
C12486-210	InGaAs (G12183-210K)					
C12492-210	InAs (P10090-21)	Two-stage TE-cooled	Sapphire glass	ϕ1		$+2.5^{+0.5}_{-0.1}$
P4631-03	InSb (P6606-310)	Three-stage TE-cooled		1 × 1		+4.5 ± 0.25
C12494-210S	InAsSb (P11120-201)	Two-stage TE-cooled	Sapphire glass	ϕ1		$+2.5^{+0.5}_{-0.1}$
C12494-210M	InAsSb (P12691-201G)		AR coated Ge			
NEW C12494-011LH	InAsSb (P13894-011NA)	Non-cooled	None	1 × 1	±2.5 ± 0.2	-
NEW C12494-211L	InAsSb (P13894-211MA)	Two-stage TE-cooled	AR coated Ge		±15 ± 0.5	$+2.5^{+0.5}_{-0.1}$

*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)
G6121	10	±18	-	0 to +40	-20 to +50
C12483-250	0.2		+5		
C12485-210	0.06				
C12486-210	0.07				
C12492-210	2.6				
P4631-03	67		+7		
C12494-210S	26		+5		
C12494-210M					
NEW C12494-011LH	1 W	±2.7	-		
NEW C12494-211L	52 mW	±18	+5		

*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. ($W/Hz^{1/2}$)
G6121	25	1.55	1.7	6.6×10^5	1×10^6	5×10^{-13}	3×10^{-12}
C12483-250	-15		1.66	3.3×10^7	5×10^7	7×10^{-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}
P4631-03	-58	5.5	6.1	1.2×10^5	1.5×10^5	3×10^{-11}	6×10^{-11}
C12494-210S	-28	4.9	5.9	5×10^5	7.5×10^5	1×10^{-10}	3×10^{-10}
C12494-210M		6.7	8.3				
NEW C12494-011LH	25	5.6	11	24*4	40*4	5×10^{-9}	9×10^{-9}
NEW C12494-211L	-28		10.2	2.5×10^{2}*4	3.5×10^{2}*4	1.5×10^{-9}	4.5×10^{-9}

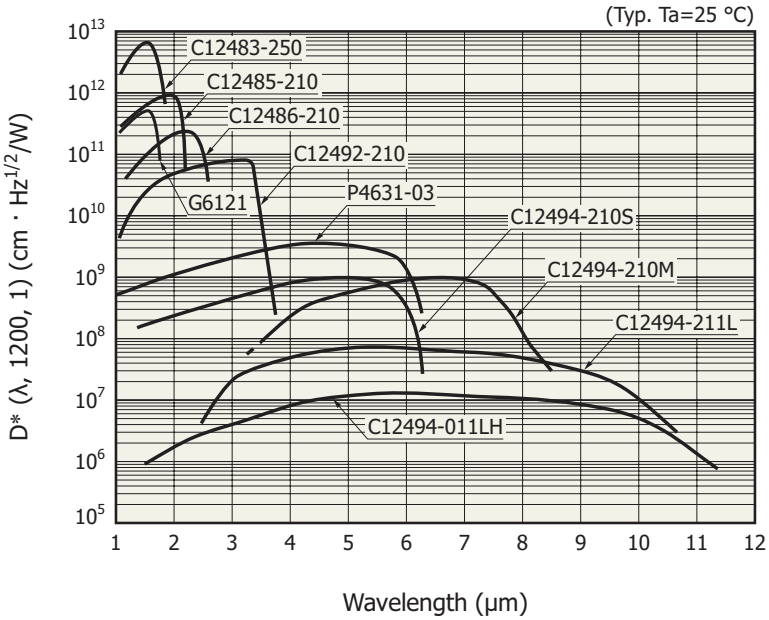
*3: f=100 Hz (G6121, C12485-210, C12486-210, C12483-250), f=1.2 kHz (P4631-03, C12492-210, C12494-210S/-210M/-011LH/-211L)
*4: Uniform irradiation on the entire photosensitive area.

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

Type no.	Frequency response -3 dB (Hz)			Output impedance	Maximum output voltage RL=1 kΩ	Current consumption*5			
						Vcc		Vp	
	FcL	FcH				Typ.	Max.	Typ.	Max.
	Typ.	Min.	Typ.	(Ω)	(V)	(mA)	(mA)	(mA)	(mA)
G6121	DC	6.4k	8 k	50	+10	±7	±15	-	-
C12483-250	DC	900	1.1 k			+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	+60, -30		
C12492-210	5	40 k	50 k		±13	+30, -20	+80, -30	+600	
P4631-03	DC	80 k	100 k		+10	+80, -22	+90, -30	+950	
C12494-210S	5	80 k	100 k		±13	+30, -20	+80, -30	+600	
C12494-210M									
NEW C12494-011LH	DC	40 M	50 M		±2	±35	±45	-	-
NEW C12494-211L		750 k	1 M		+10	+30, -20	+80, -30	+500	+1100

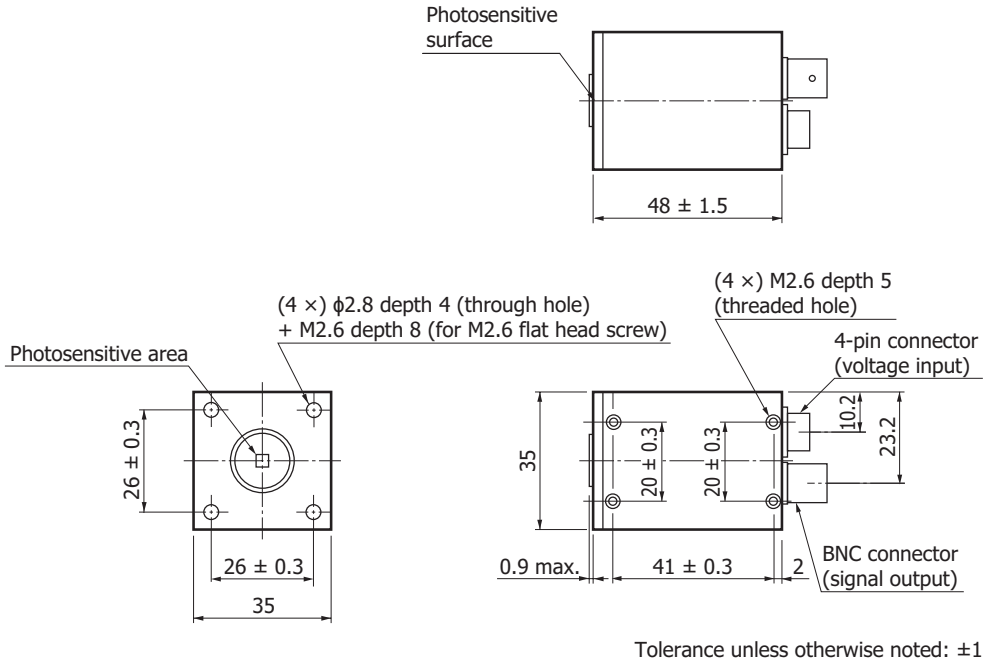
*5: Vcc=±15 V (G6121), Vcc=±15 V, Vp=2.5 V (C12485-210, C12486-210, C12483-250, C12492-210, C12494-210S/-210M/-211L), Vcc=±15 V, Vp=4.5 V (P4631-03), Vcc=±2.5 V (C12494-011LH)
Recommended DC power supply (analog power supply): PW18-1.3ATS (TEXIO Technology), E3630A (Keysight Technologies)
Current capacity: More than 1.5 times the maximum current consumption
Ripple noise: 5 mVp-p or less (±15 V, +2.5 V, +4.5 V power supply)

Spectral response



Dimensional outlines (unit: mm)

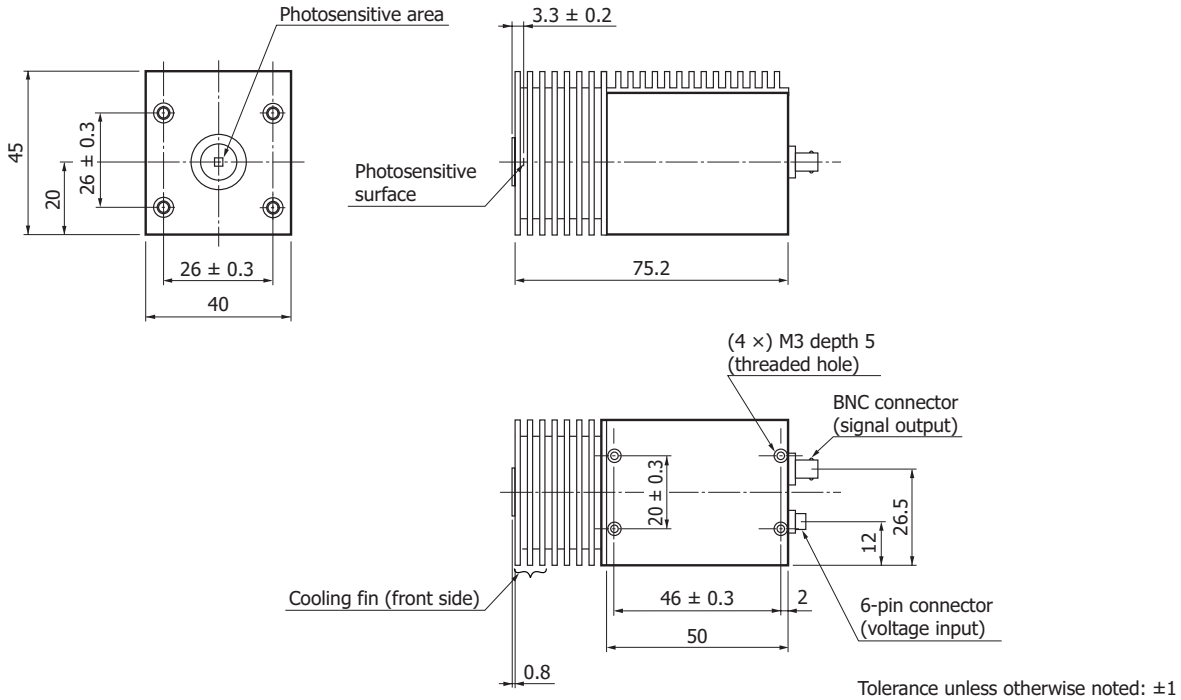
G6121



Tolerance unless otherwise noted: ±1

KIRDA0008EG

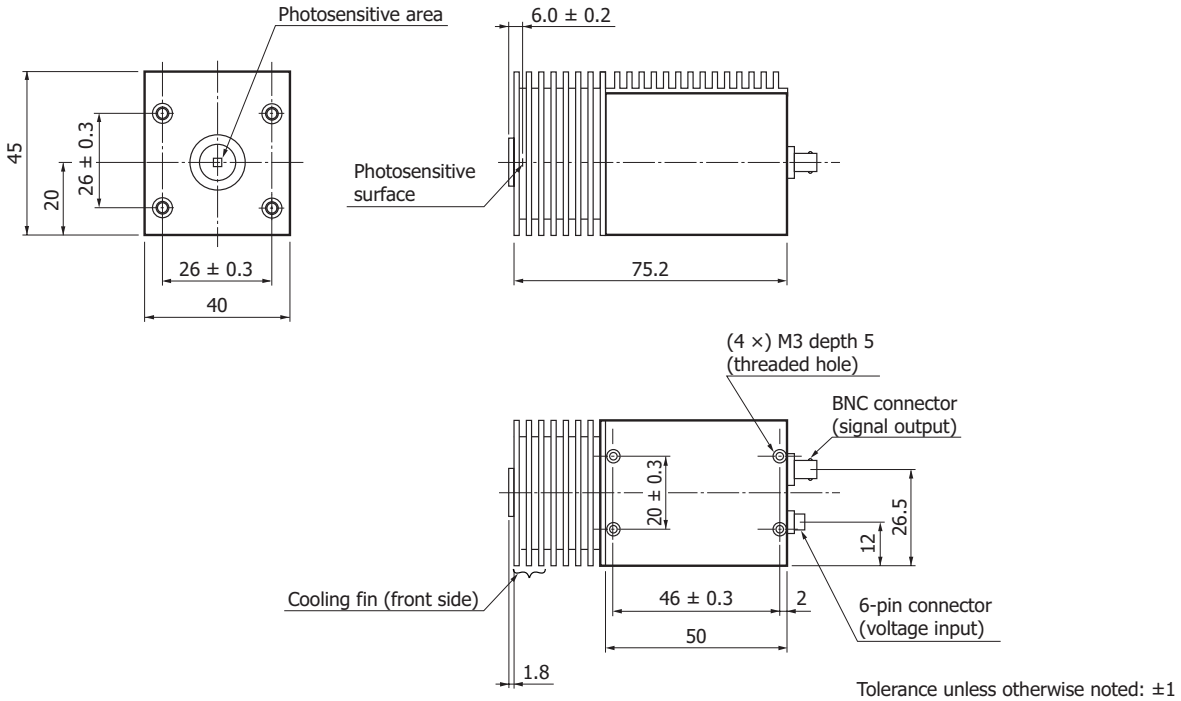
C12485-210, C12486-210, C12483-250, C12492-210, C12494-210S/-211L



Tolerance unless otherwise noted: ±1

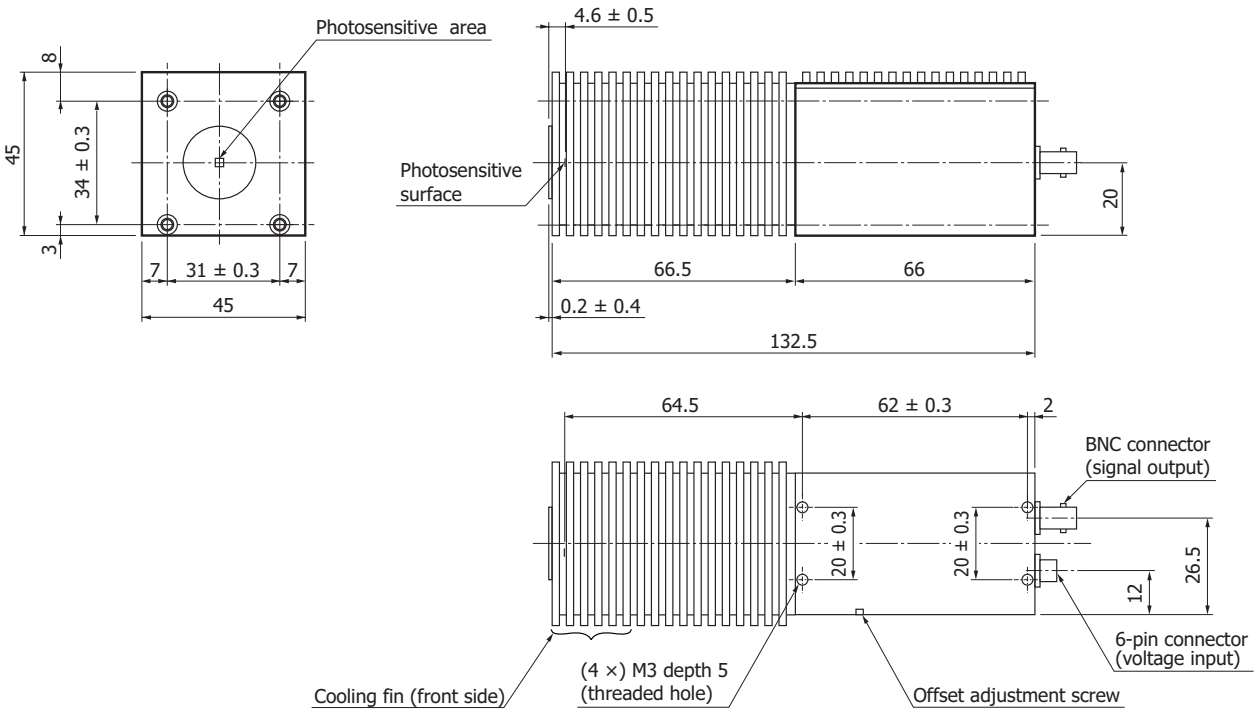
KIRDA0009EI

C12494-210M



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

P4631-03

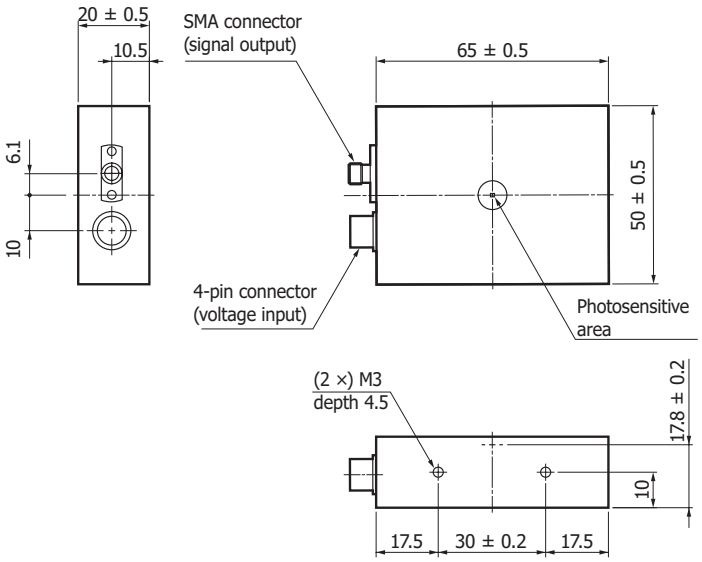


Tolerance unless otherwise noted: ±1

KIRDA0137EF

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

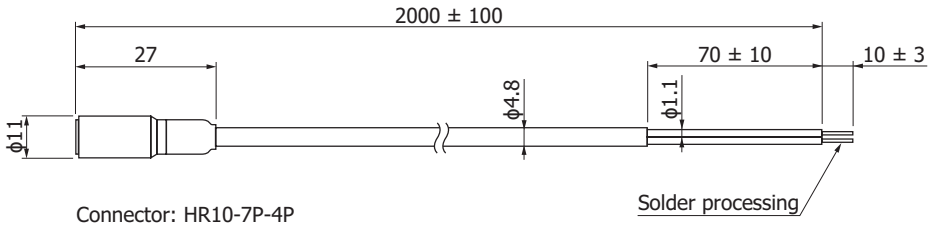
C12494-011LH



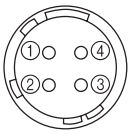
Tolerance unless otherwise noted: ±0.2

KIRDA0269EC

4-conductor cable (for DC power supply) A4372-02



Connector: HR10-7P-4P
(made by Hirose Electric)



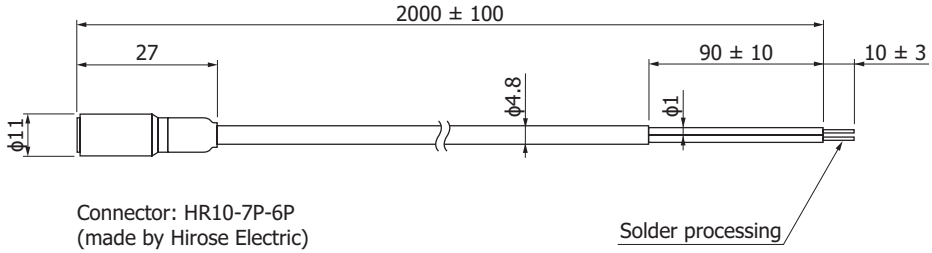
Connector end

Pin no.	Pin connection	Lead color
①	+15 V or +2.5 V	White
②	GND	Black/white/blue stranded wire
③	GND	
④	-15 V or -2.5 V	Blue

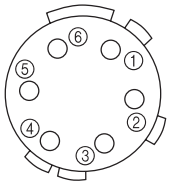
Tolerance unless otherwise noted: ±1

KIRDA0196EF

6-conductor cable (for DC power supply) A4372-03



Connector: HR10-7P-6P
(made by Hirose Electric)



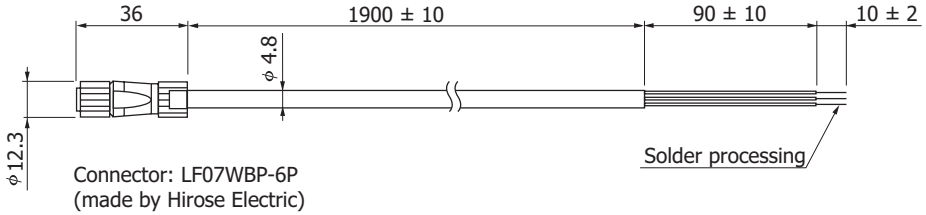
Connector

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 stranded wire

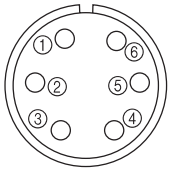
Tolerance unless otherwise noted: ±1

KIRDA0197EE

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



Connector: LF07WBP-6P
(made by Hirose Electric)



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

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

Tolerance unless otherwise noted: ±1

KIRDA0241EB

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 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

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