

## InAsSb photovoltaic detector with preamp



P16702-011MN

### Infrared detector with preamp offering high sensitivity in the mid-infrared region (up to 11 μm)

It is a compact infrared detector that integrates an InAsSb photovoltaic detector (up to 11 μm) and a preamp. It is approximately 1/200 th the size of previous module products, and achieves a response speed of 100 MHz, which is twice as fast. This product is an environmentally friendly infrared detector and do not use lead, mercury, or cadmium, which are substances restricted by the RoHS directive.

#### Features

- ➔ Compact (TO-5)
- ➔ High-speed response (DC to 100 MHz)
- ➔ RoHS compliant (lead, mercury, cadmium free)

#### Applications

- ➔ Gas analysis (combined with QCL)
- ➔ CO<sub>2</sub> laser monitor
- ➔ Non-invasive blood analysis

#### Structure

Parameter	Specification	Unit
Photosensitive area	0.7 × 0.7	mm
Package	TO-5	-
Window material	No	-
Field of view (FOV)	97	degrees

#### Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Supply voltage (for preamp)	Vcc	+4	V
Reverse voltage (for element)	VR	+1	V
Operating temperature*1	Topr	-30 to +60	°C
Storage temperature*1	Tstg	-30 to +60	°C
Incident light level	Pin	1	W/mm <sup>2</sup>

\*1: No dew condensation

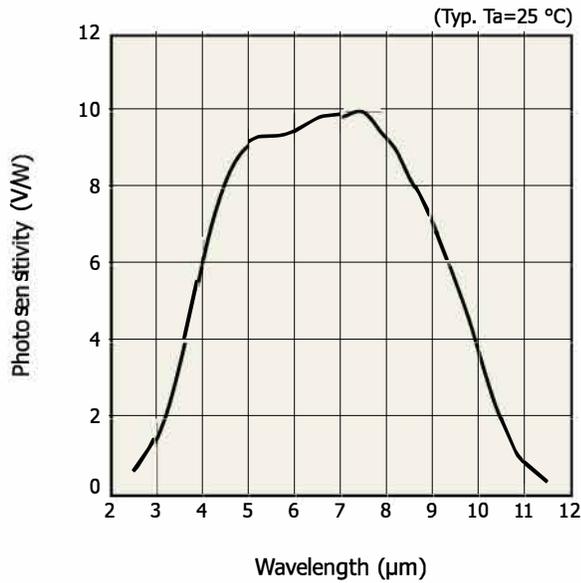
When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

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.

#### Electrical and optical characteristics (Typ. Ta=25 °C, Vcc=+3.3 V, 50 Ω system, unless otherwise noted)

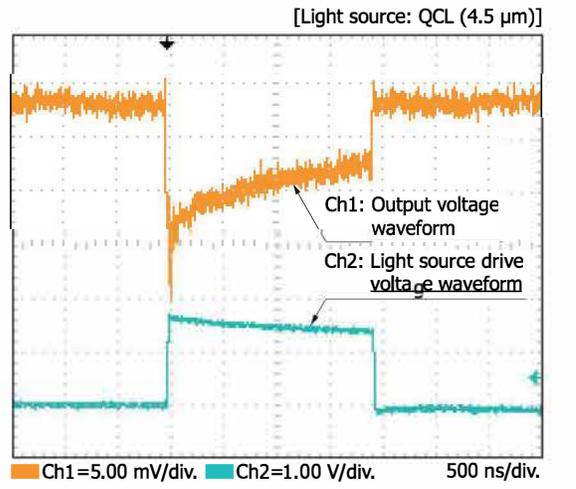
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak sensitivity wavelength	λp		-	7.4	-	μm
Cutoff wavelength	λc		9.7	11	-	μm
Photosensitivity	S	λ=λp	-	10	-	V/W
Reverse voltage (for element)	VR		-	0.7	-	V
Noise equivalent power	NEP	λ=λp, f=50 kHz	-	8.0 × 10 <sup>-9</sup>	5.0 × 10 <sup>-8</sup>	W/Hz <sup>1/2</sup>
Frequency characteristics	FcL	-3 dB	-	DC	-	-
	FcH	-3 dB	80	100	-	MHz
Output voltage level	-		0.6	0.9	1.2	V
Maximum output voltage amplitude	Vp-p max		-	-0.5	-	V
Supply voltage (for preamp)	Vcc		3.2	3.3	3.4	V
Current consumption	Ic		20	26	35	mA

**Spectral response**



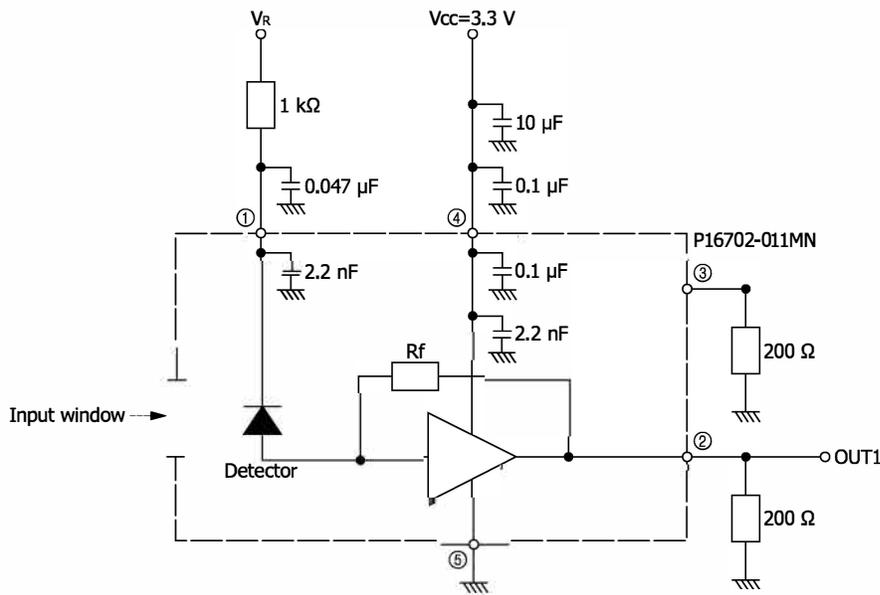
KIRDB0734EA

**Output waveform example**



KIRDC0147EA

**Connection example**

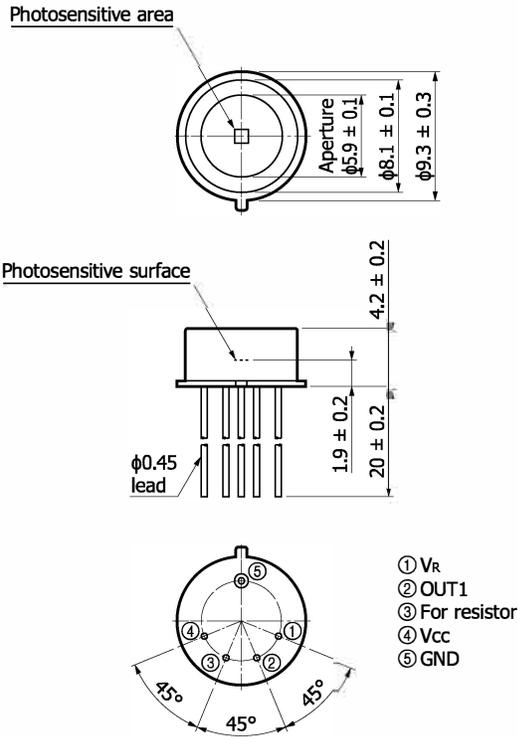


KIRDC0145EA

Note: Please connect the same resistance to the terminal ②③.

Make sure to connect a bypass capacitor (0.1 to  $10\text{ }\mu\text{F}$ ) to the supply voltage ④ to prevent oscillation.

**Dimensional outline (unit: mm)**



Note: Please connect the same resistance to the terminal ②③.  
 Make sure to connect a bypass capacitor (0.1 to 10 μF) to the supply voltage ④ to prevent oscillation.

KIRDA0289EA

**Precautions**

■ Electrostatic breakdown

The P16702-011MN may be damaged or deteriorated by static electricity. Please refer to precautions of "compound opto-semiconductors (photosensors, light emitters)" for use.

■ Wiring

Applying voltage or current with the wrong polarity to electronic parts such as a preamp may degrade the characteristics or destroy the elements. Please refer to the dimensional outline to do wiring correctly.

**Related information**[www.hamamatsu.com/sp/ssd/doc\\_en.html](http://www.hamamatsu.com/sp/ssd/doc_en.html)

- Precautions
  - Disclaimer
  - Safety consideration
  - Unsealed products
  - Compound opto-semiconductors (photosensors, light emitters)
- Technical note
  - Compound semiconductor photosensors



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