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InGaAs APD

G8931 series



High-speed response

The G8931 series are InGaAs APDs used for distance measurement, optical communication, and low-light-level detection. The G8931-04 provides high-speed response at 2.5 Gbps, which is necessary for SONET, G/GE-PON, and other optical trunk lines. The G8931-20 features a large ϕ0.2 mm photosensitive area.

Features

- **High-speed response: 2.5 Gbps (G8931-04)**
- **Low dark current**
- **Low capacitance**
- **High sensitivity**

Applications

- **Distance measurement**
- **Optical communications**
- **Low-light-level detection**

Structure

Parameter	Symbol	G8931-04	G8931-10	G8931-20	Unit
Photosensitive area	-	ϕ0.04	ϕ0.1	ϕ0.2	mm
Package	-	TO-18			-
Window material	-	Borosilicate glass (AR coated: 1.55 μm)			-

Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	G8931-04	G8931-10	G8931-20	Unit
Forward current	I_F	10			mA
Reverse current	I_R	2			mA
Operating temperature*1	Topr	-40 to +85			°C
Storage temperature*1	Tstg	-55 to +125			°C

*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.

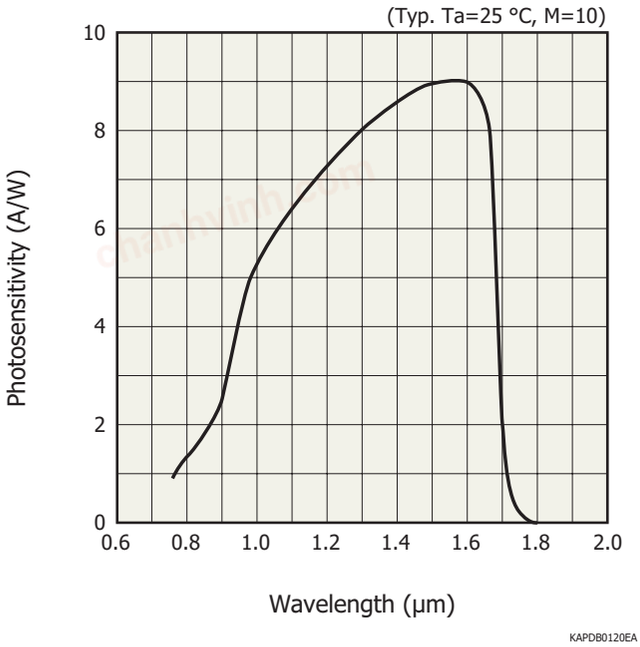
Note: Always be sure to use the product within the absolute maximum ratings. Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality.

Electrical and optical characteristics (Ta=25 °C)

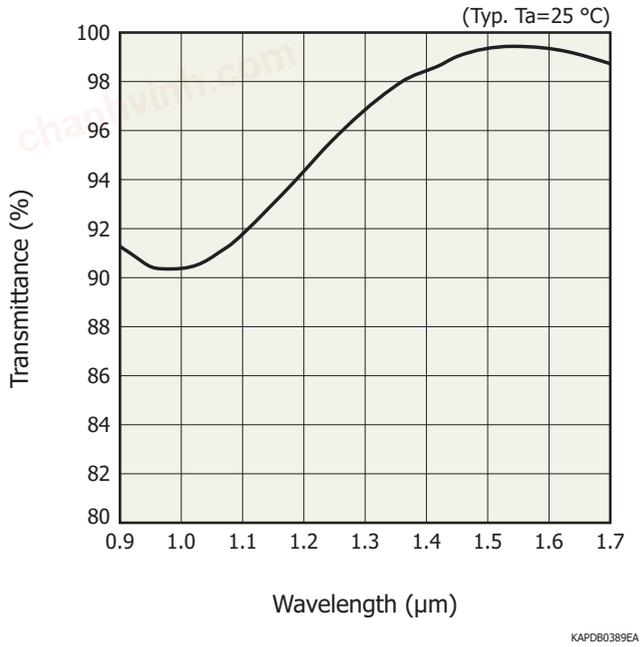
Parameter	Symbol	Condition	G8931-04			G8931-10			G8931-20			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	λ		0.95 to 1.7			0.95 to 1.7			0.95 to 1.7			μm
Peak sensitivity wavelength	λp		-	1.55	-	-	1.55	-	-	1.55	-	μm
Photosensitivity	S	λ=1.55 μm, M=1	0.8	0.9	-	0.8	0.9	-	0.8	0.9	-	A/W
Dark current	I_D	V_R=V_{BR} × 0.9	-	40	65	-	90	140	-	150	200	nA
Temperature coefficient of dark current	ΔT_{ID}	V_R=V_{BR} × 0.9	-	1.07	-	-	1.07	-	-	1.07	-	times/°C
Cutoff frequency	fc	M=10	3	4	-	0.8	1.5	-	0.6	0.9	-	GHz
Terminal capacitance	Ct	V_R=V_{BR} × 0.9	-	0.35	0.45	-	0.7	1	-	1.5	2	pF
Breakdown voltage	V_{BR}	I_D=100 μA	40	55	60	40	55	60	40	55	60	V
Temperature coefficient of breakdown voltage	Γ	-40 to +85 °C	-	0.11	-	-	0.11	-	-	0.11	-	V/°C
Excess noise figure	x	Ipo=3 μA, M=10 to 20	-	0.7	0.85	-	0.7	0.85	-	0.7	0.85	-
Gain	M	λ=1.55 μm, Ipo=1 μA	20	30	-	20	30	-	20	30	-	-

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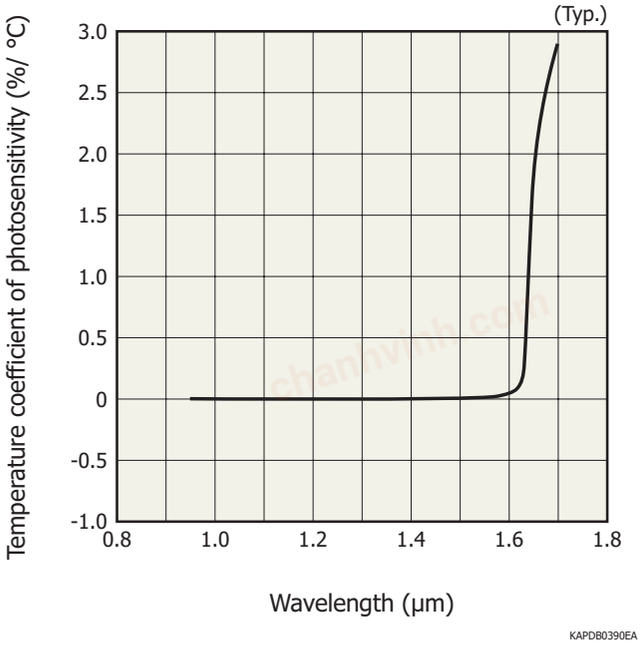
Spectral response



Spectral transmittance of window material



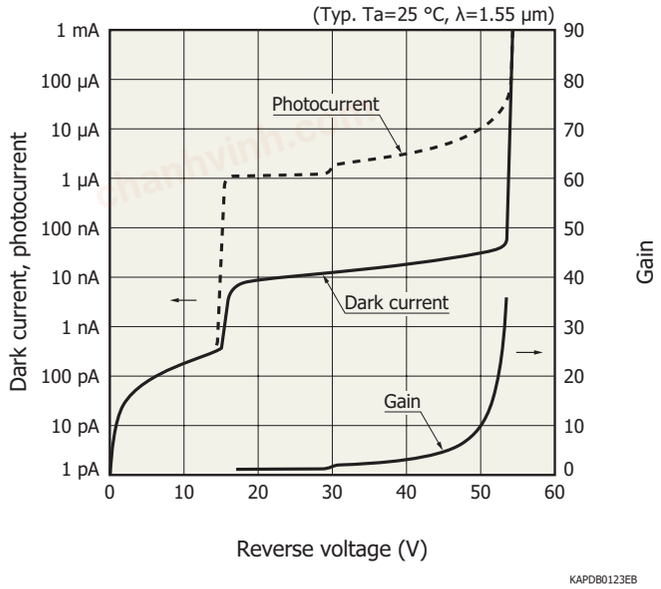
Photosensitivity temperature characteristics



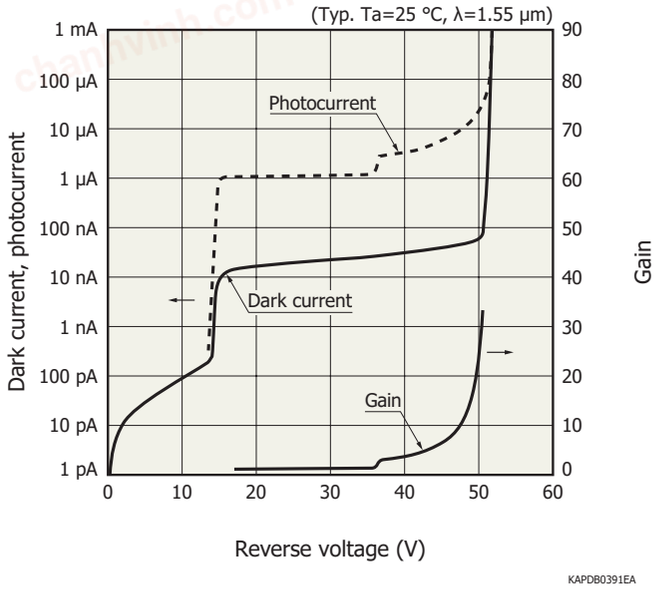
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Dark current, photocurrent, gain vs. reverse voltage

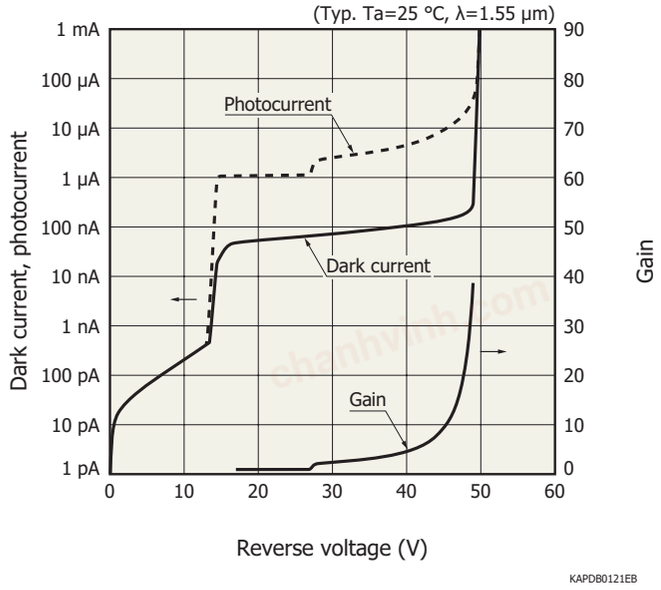
G8931-04



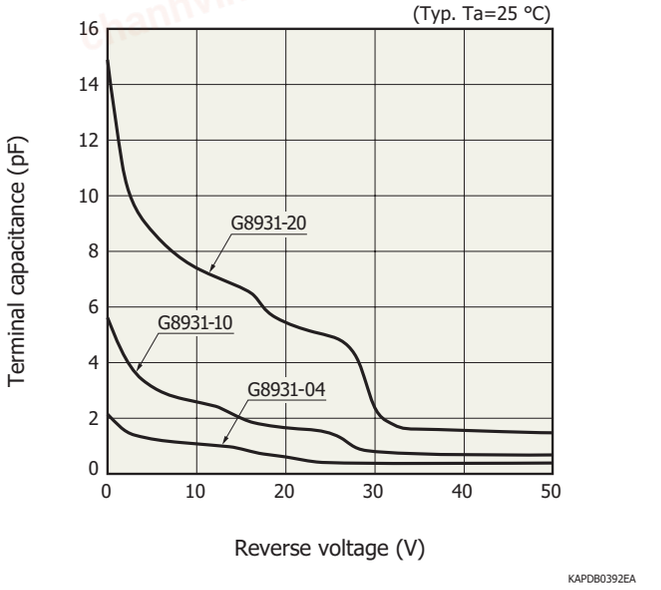
G8931-10



G8931-20

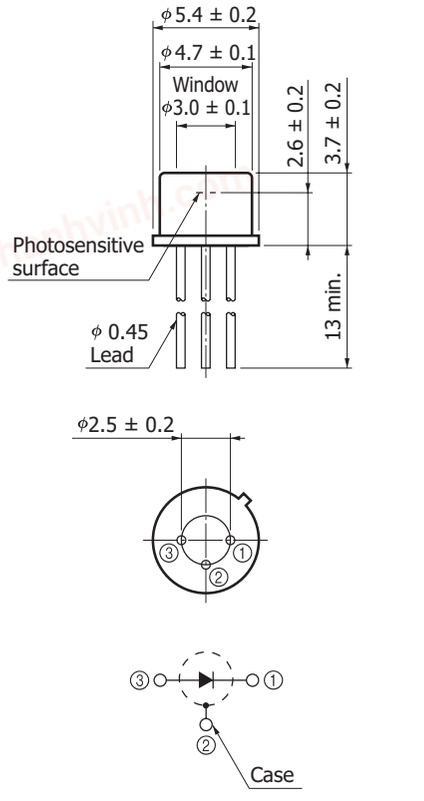


Terminal capacitance vs. reverse voltage



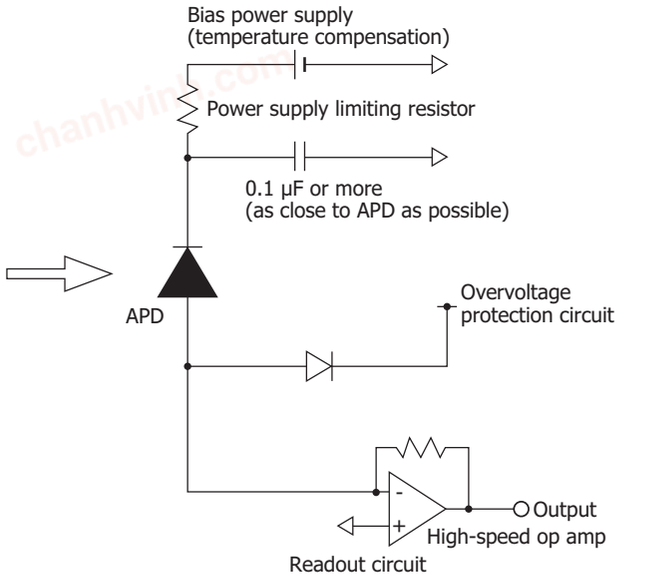
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Dimensional outline (unit: mm)



KAPDA0034EA

APD peripheral circuit example



KAPDC0005EC

Related information

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

■ Precautions
· Disclaimer
· Safety precautions
· Metal, ceramic, plastic packages
· Compound semiconductor photosensors

■ Technical information
· Infrared detectors

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HAMAMATSU

www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Solid State Division
1126-1 Ichino-cho, Higashi-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, N.J. 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218, E-mail: usa@hamamatsu.com
Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-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, United Kingdom, 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, 20020 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.: B1201, Jiaming Center, No.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.: 8F-3, No. 158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)3-659-0080, Fax: (886)3-659-0081, E-mail: info@hamamatsu.com.tw

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