HAMAMATSU
PHOTON IS OUR BUSINESS

InGaAs PIN photodiodes

G12180 series

Photosensitive area from ϕ0.3 mm to ϕ5 mm

InGaAs PIN photodiodes have large shunt resistance and feature very low noise. Hamamatsu provides various types of InGaAs PIN photodiodes with photosensitive area from ϕ0.3 mm to ϕ5 mm.

Features

- **Low noise, low dark current**
- **Low terminal capacitance**
- **Large photosensitive area**
- **Various photosensitive area sizes available**

Applications

- **Laser monitors**
- **Optical power meters**
- **Laser diode life test**
- **NIR (near infrared) photometry**
- **Optical communications**

Specifications / Absolute maximum ratings

Type no.	Dimensional outline/ Window material*1	Package	Cooling	Photosensitive area (mm)	Absolute maximum ratings			
					Reverse voltage V_R max (V)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)	Soldering conditions
G12180-003A	(1)/K	TO-18	Non-cooled	ϕ0.3	20	-40 to +100	-55 to +125	260 °C or less, within 10 s
G12180-005A				ϕ0.5				
G12180-010A				ϕ1	10			
G12180-020A	(2)/K	TO-5		ϕ2	5			
G12180-030A				ϕ3				
G12180-050A	(3)/K	TO-8		ϕ5	2			

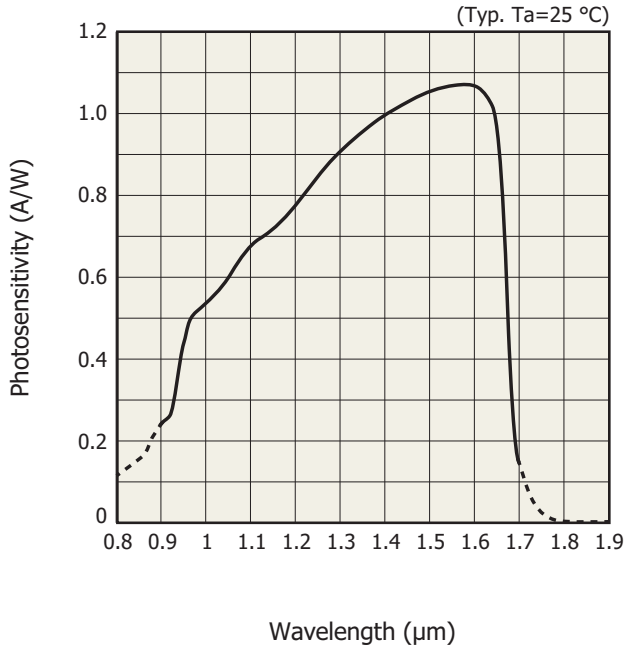
*1: K: borosilicate glass with anti-reflective coating (optimized for 1.55 µm peak)
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

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

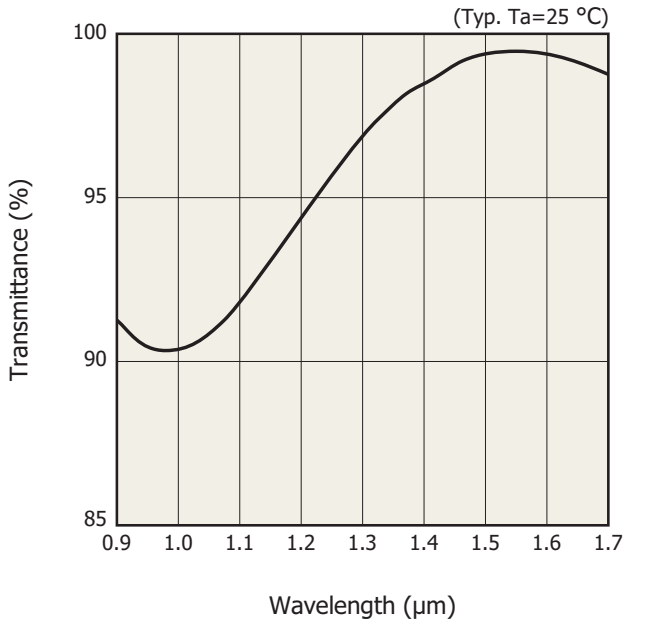
Type no.	Spectral response range λ (µm)	Peak sensitivity wavelength λp (µm)	Photosensitivity S				Dark current I_D V_R=5 V		Temperature coefficient of dark current ΔT_{ID}	Cutoff frequency fc V_R=5 V R_L=50 Ω -3 dB		Terminal capacitance Ct V_R=5 V f=1 MHz		Shunt resistance Rsh V_R=10 mV		Detectivity D* λ=λp		Noize equivalent power NEP λ=λp	
			1.3 µm		λ=λp														
			Min. (A/W)	Typ. (A/W)	Min. (A/W)	Typ. (A/W)	Typ. (nA)	Max. (nA)		Min. (MHz)	Typ. (MHz)	Typ. (pF)	Max. (pF)	Min. (MΩ)	Typ. (MΩ)	Min. (cm·Hz$^{1/2}$/W)	Typ. (cm·Hz$^{1/2}$/W)	Typ. (W/Hz$^{1/2}$)	Max. (W/Hz$^{1/2}$)
G12180-003A	0.9 to 1.7	1.55	0.8	0.9	0.9	1.1	0.1	0.5	1.09	450	600	5	7.5	200	1000	2.4×10^{12}	6.3×10^{12}	4.2×10^{-15}	1.2×10^{-14}
G12180-005A							0.15	0.75		160	200	15	20	80	400			7×10^{-15}	1.9×10^{-14}
G12180-010A							0.8	4		25	60	55	120	25	125			1.4×10^{-14}	3.8×10^{-14}
G12180-020A							1.5*2	7.5*2		4*3	13*3	250*3	800*3	6.5	30			2.8×10^{-14}	7.5×10^{-14}
G12180-030A							2.5*2	12.5*2		2.5*3	7*3	450*3	1500*3	4	20			4.4×10^{-14}	1.1×10^{-13}
G12180-050A							5*2	25*2		0.5*3	3*3	1000*3	7000*3	1.3	6.5			7×10^{-14}	1.9×10^{-13}

*2: V_R=1 V
*3: V_R=1 V, f=1 MHz

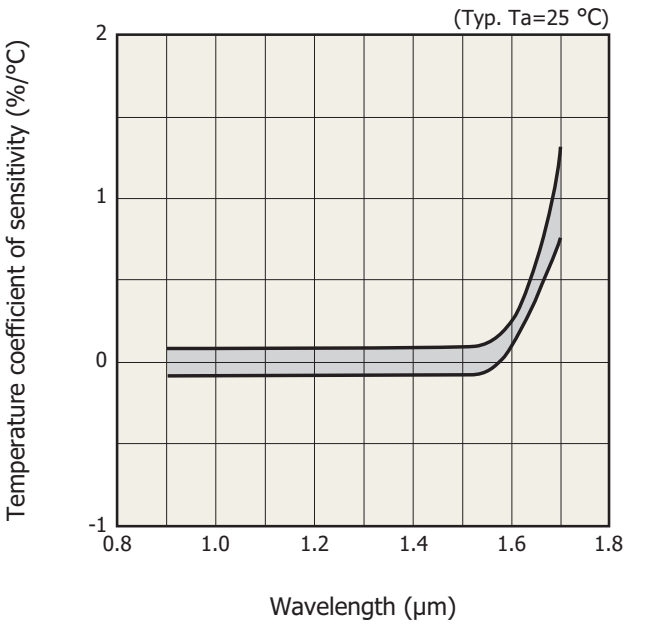
Spectral response



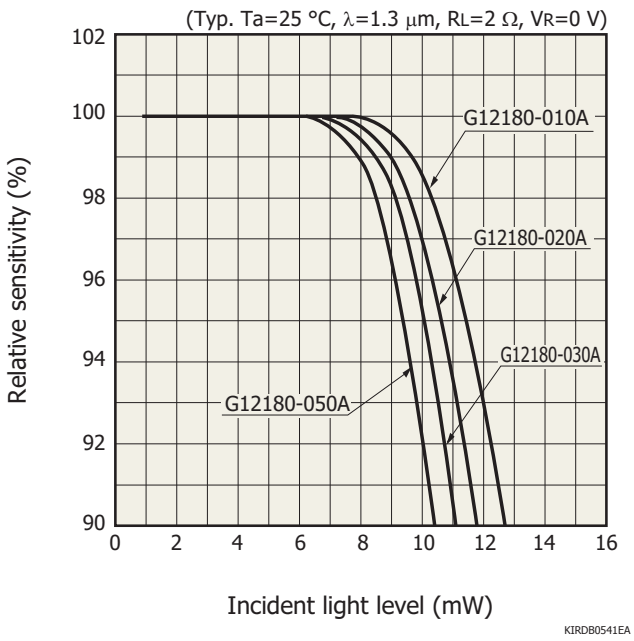
Spectral transmittance characteristics of window material



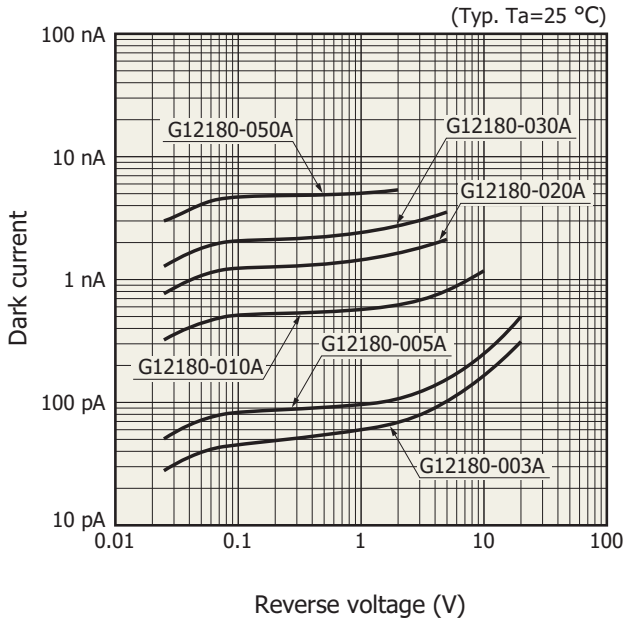
Photosensitivity temperature characteristics



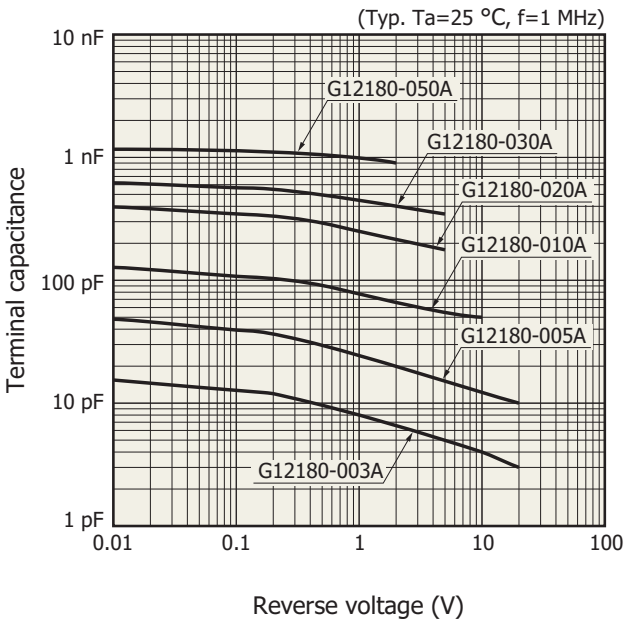
Linearity



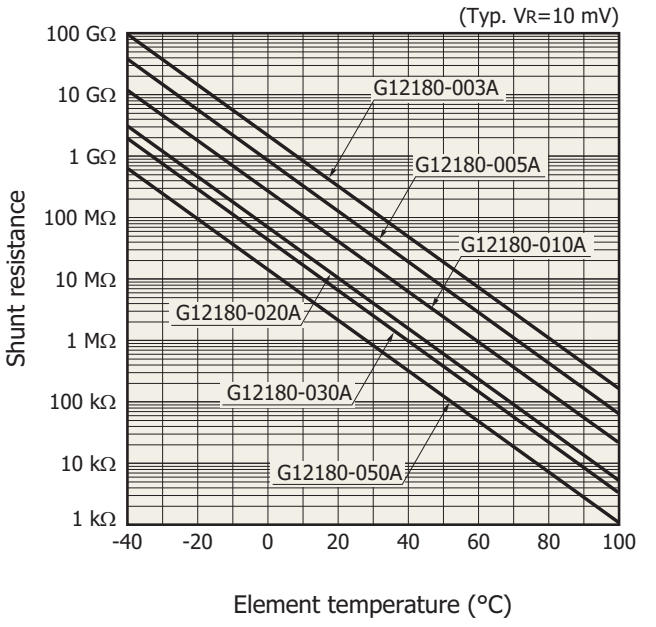
Dark current vs. reverse voltage



Terminal capacitance vs. reverse voltage

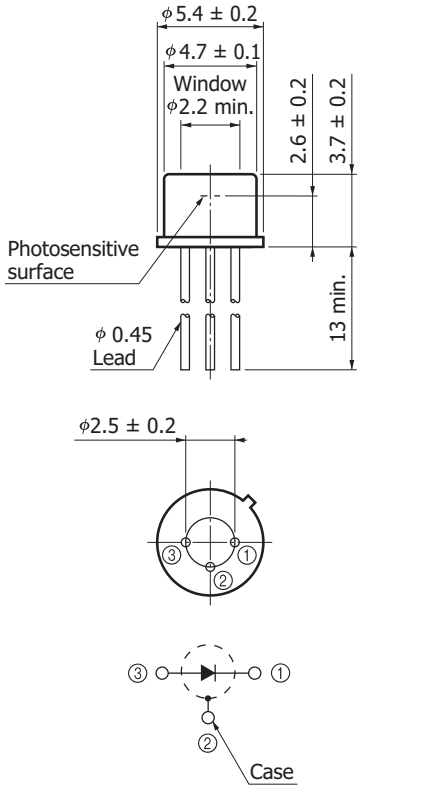


Shunt resistance vs. element temperature

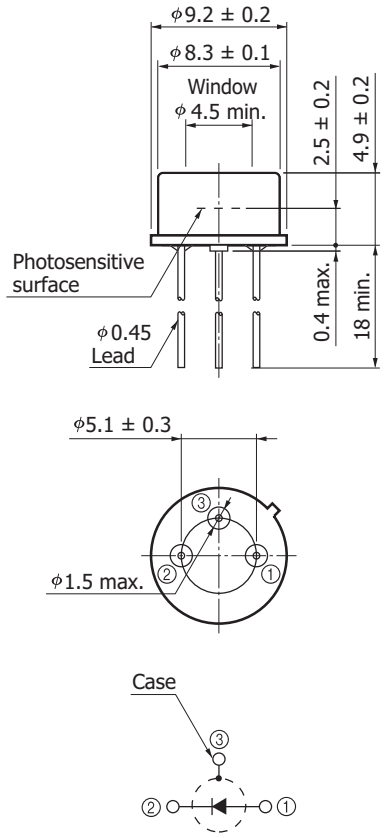


Dimensional outlines (unit: mm)

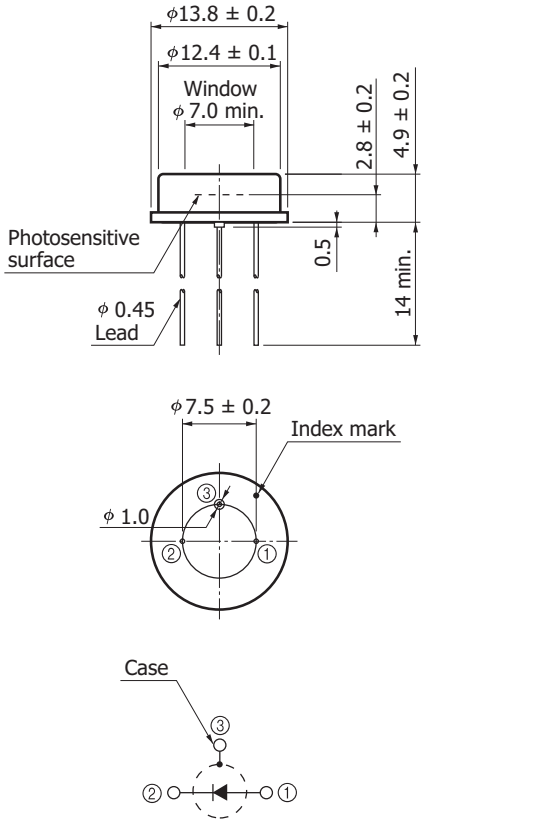
(1) G12180-003A/-005A/-010A



(2) G12180-020A/-030A



(3) G12180-050A



Related information

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

■ Precautions
- Notice
- Metal, ceramic, Plastic products/Precautions

■ Technical information
- infrared detector/technical information

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, P.O.Box 6910, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218
Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 8152-375-0, Fax: (49) 8152-265-8
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
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
North Europe: Hamamatsu Photonics Norden AB: Thorshamnsgatan 35 16440 Kista, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01
Italy: Hamamatsu Photonics Italia S.R.L.: Strada della Moia, 1 int. 6, 20020 Arese, (Milano), Italy, Telephone: (39) 02-935-81-733, Fax: (39) 02-935-81-741
China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86) 10-6586-6006, Fax: (86) 10-6586-2866

Cat. No. KIRD1121E02 Jan. 2014 DN