

InGaAs PIN photodiodes

G12180 series

Photosensitive area from $\phi 0.3$ mm to $\phi 5$ 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 $\phi 0.3$ mm to $\phi 5$ 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 VR 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 μ m 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.

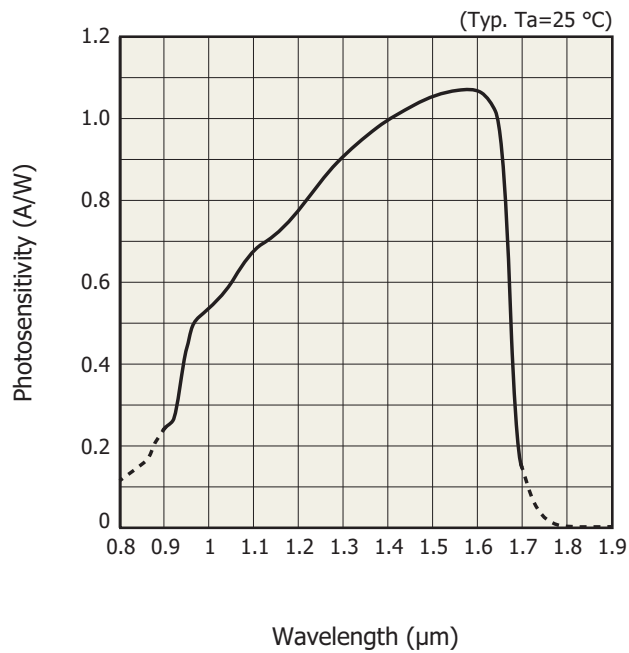
Electrical and optical characteristics (Typ. Ta=25 °C, unless otherwise noted)

Type no.	Spectral response range λ (μm)	Peak sensitivity wave-length λ_p (μm)	Photosensitivity S				Dark current ID VR=5 V		Temperature coefficient of dark current ΔT_{ID}	Cutoff frequency fc VR=5 V RL=50 Ω -3 dB		Terminal capacitance Ct VR=5 V f=1 MHz		Shunt resistance Rsh VR=10 mV		Detectivity D* $\lambda=\lambda_p$		Noize equivalent power NEP $\lambda=\lambda_p$			
			1.3 μm		$\lambda=\lambda_p$					Min. (MHz)	Typ. (MHz)	Typ. (pF)	Max. (pF)	Min. (M Ω)	Typ. (M Ω)	Min. (cm ² Hz ^{1/2} /W)	Typ. (cm ² Hz ^{1/2} /W)	Typ. (W/Hz ^{1/2})	Max. (W/Hz ^{1/2})		
			Min. (A/W)	Typ. (A/W)	Min. (A/W)	Typ. (A/W)	Typ. (nA)	Max. (nA)													
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}

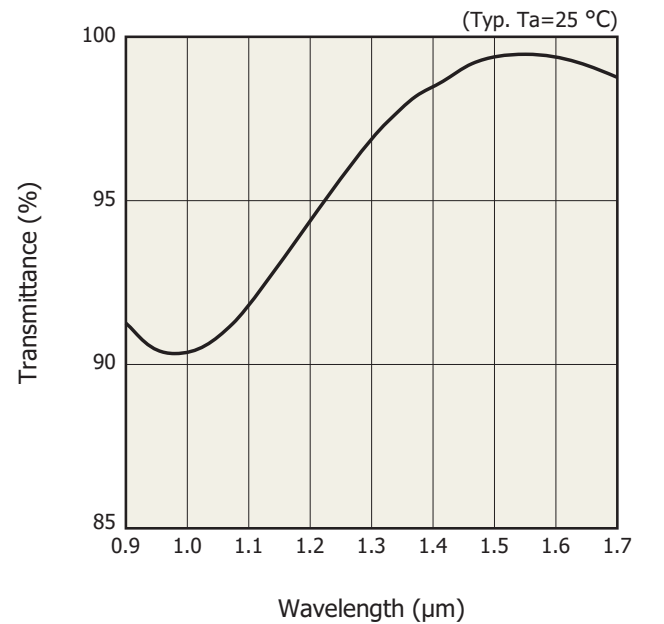
*2: VR=1 V

*3: VR=1 V, f=1 MHz

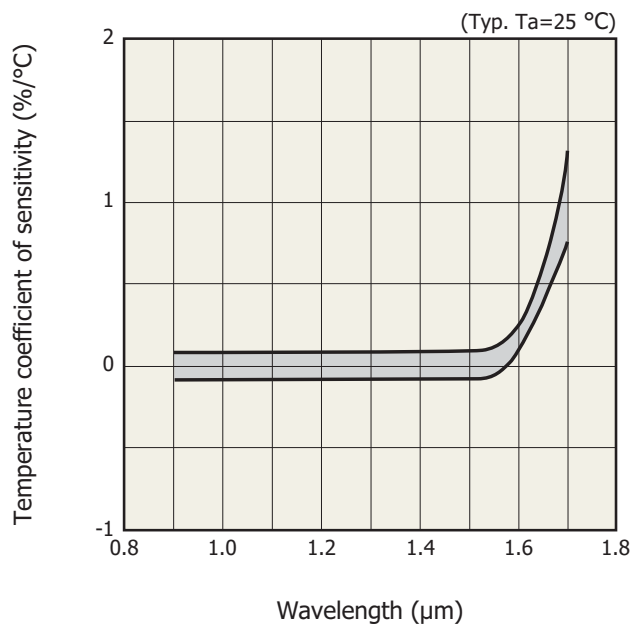
Spectral response



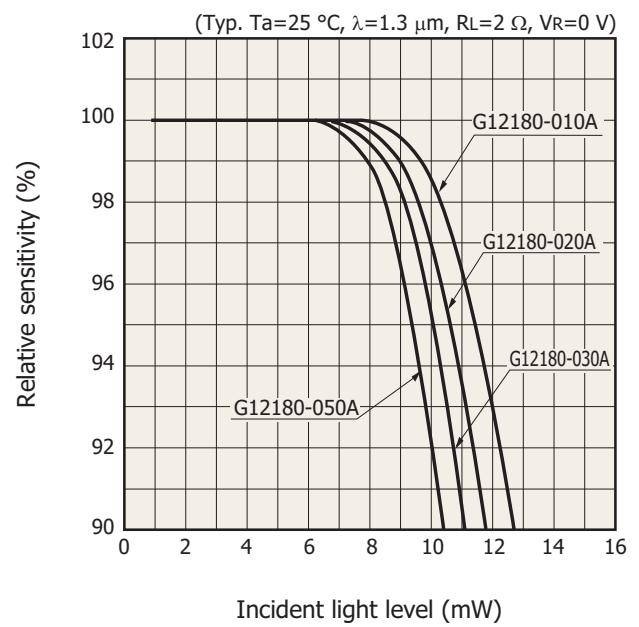
Spectral transmittance characteristics of window material



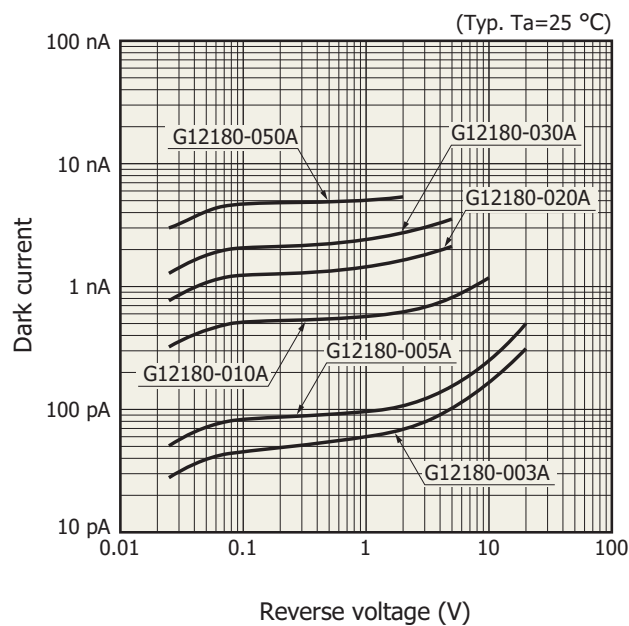
Photosensitivity temperature characteristics



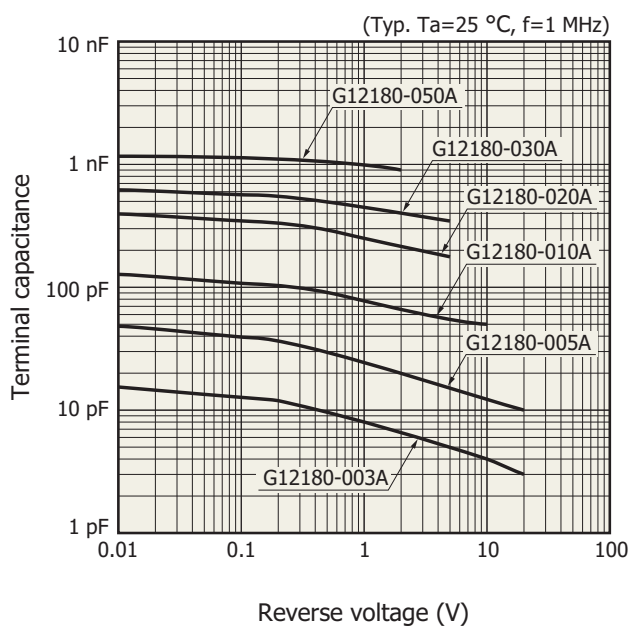
Linearity



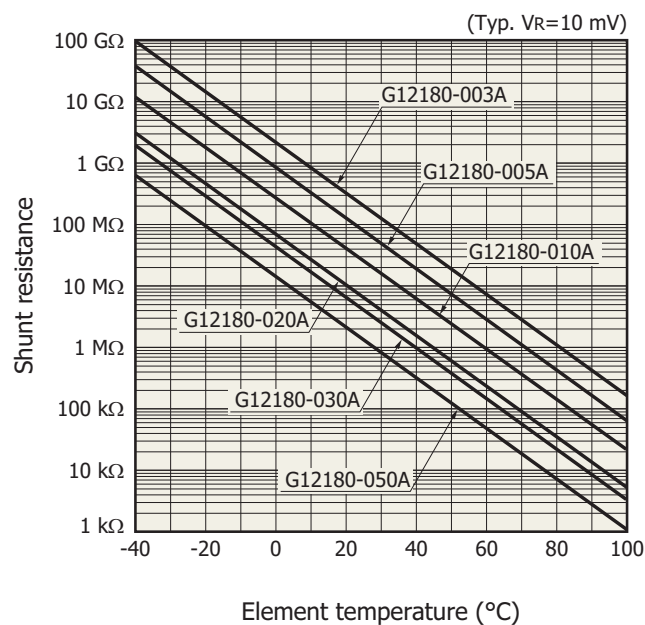
Dark current vs. reverse voltage



Terminal capacitance vs. reverse voltage

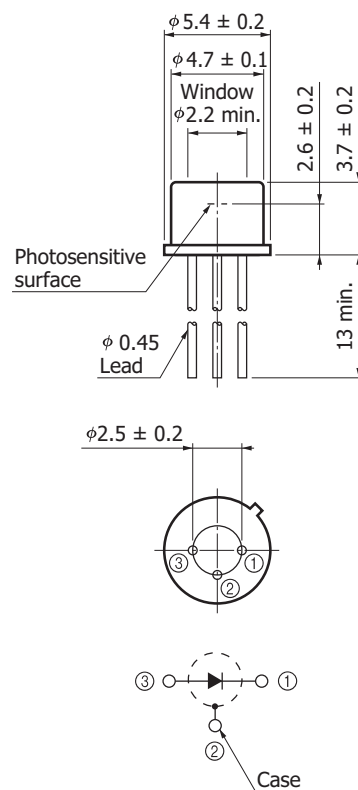


Shunt resistance vs. element temperature



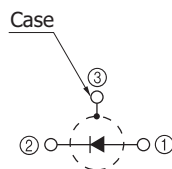
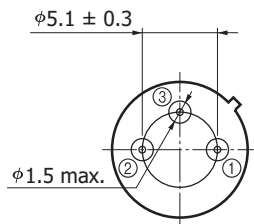
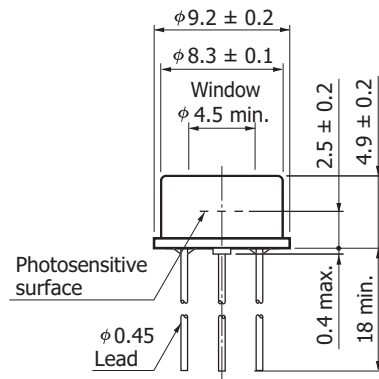
Dimensional outlines (unit: mm)

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



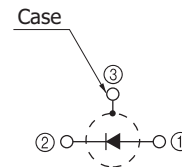
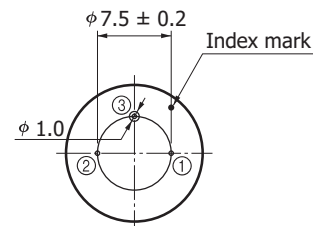
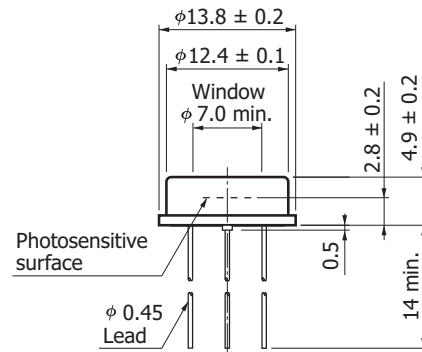
KIRDA0150EC

(2) G12180-020A/-030A



KIRDA0155EB

(3) G12180-050A



KIRDA0052EC

Related information

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

Precautions

- Notice
- Metal, ceramic, Plastic products/Precautions

Technical information

- infrared detector/technical information

Information described in this material is current as of January, 2014.

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Type numbers of products listed in the delivery specification sheets or supplied as samples may have a suffix "(X)" which means preliminary specifications or a suffix "(Z)" which means developmental specifications.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use.

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