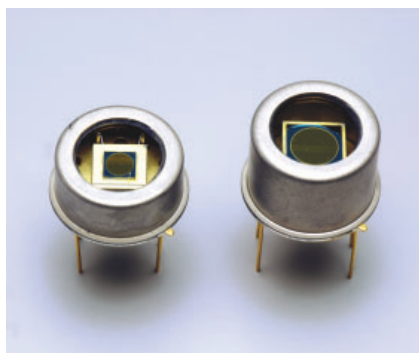


InGaAs PIN photodiodes

G8605 series



Thermoelectrically cooled NIR (near infrared) detector with low noise and high-speed response

InGaAs PIN photodiodes have small terminal capacitance for high-speed response and also feature high shunt resistance and very low noise. The G8605 series of InGaAs PIN photodiodes are thermoelectrically cooled types that decrease the dark current to achieve high D^* . One-stage (-10 °C) and two-stage (-20 °C) thermoelectrically cooled types are provided.

Features

- High-speed response
- Low noise
- Various active area sizes available from $\phi 1$ to $\phi 5$ mm

Applications

- Optical power meter
- Water content analyzer
- Laser diode life test

Accessories (Optional)

- Preamp for InGaAs PIN photodiode **C4159-03**
- Heatsink for one-stage TE-cooled type **A3179**
- Heatsink for two-stage TE-cooled type **A3179-01**
- Temperature controller for TE-cooled type **C1103-04**

Specifications / Absolute maximum ratings

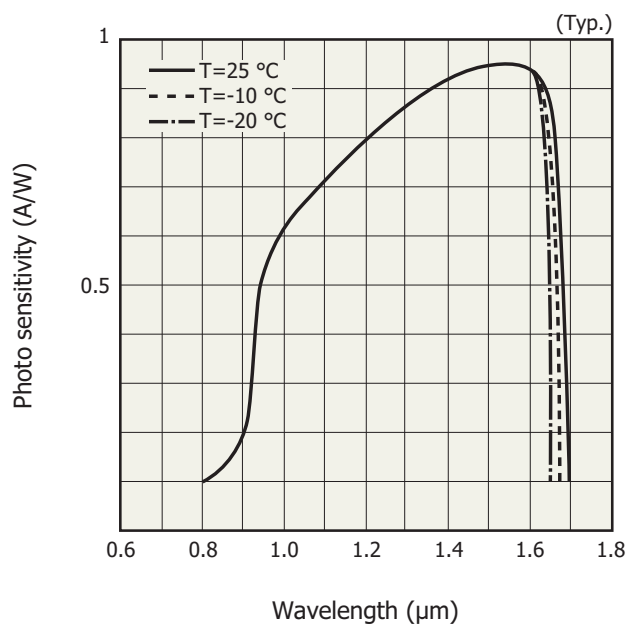
Type No.	Dimensional outline/ Window material *	Package	Cooling	Active area (mm)	Absolute maximum ratings				
					Thermistor power dissipation (mW)	TE-cooler allowable current (A)	Reverse voltage VR Max. (V)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)
G8605-11	①/K	TO-8	One-stage TE-cooled	φ1	0.2	1.5	5	-40 to +70	-55 to +85
G8605-12				φ2			5		
G8605-13				φ3			5		
G8605-15				φ5			2		
G8605-21	②/K		Two-stage TE-cooled	φ1		1.0	5		
G8605-22				φ2			5		
G8605-23				φ3			5		
G8605-25				φ5			2		

* Window material K: borosilicate glass with anti-reflective coating (1.55 μ m peak)

Electrical and optical characteristics (Typ. unless otherwise noted)

Type No.	Measurement condition	Spectral response range λ	Peak sensitivity wavelength λ_p	Photo sensitivity S		Dark current Id VR=1 V		Cut-off frequency fc VR=1 V RL=50 Ω	Terminal capacitance Ct VR=1 V f=1 MHz	Shunt resistance Rsh VR=10 mV	D* $\lambda=\lambda_p$	NEP $\lambda=\lambda_p$
	Element temperature											
	(°C)	(μ m)	(μ m)	1.3 μ m (A/W)	$\lambda=\lambda_p$ (A/W)	Typ. (nA)	Max. (nA)	(MHz)	(pF)	(M Ω)	(cm·Hz ^{1/2} /W)	(W/Hz ^{1/2})
G8605-11	-10	0.9 to 1.67	1.55	0.9	0.95	0.07	0.35	18	150	1500	2 × 10 ¹³	5 × 10 ⁻¹⁵
G8605-12						0.3	1.5	4	550	300		1 × 10 ⁻¹⁴
G8605-13						1	5	2	1000	100		2 × 10 ⁻¹⁴
G8605-15						2.5	12.5	0.6	3500	30		3 × 10 ⁻¹⁴
G8605-21	-20	0.9 to 1.65				0.03	0.15	18	150	3000	3 × 10 ¹³	3 × 10 ⁻¹⁵
G8605-22						0.15	0.75	4	550	600		7 × 10 ⁻¹⁵
G8605-23						0.5	2.5	2	1000	200		1 × 10 ⁻¹⁴
G8605-25						1.2	6	0.6	3500	60		2 × 10 ⁻¹⁴

Spectral response



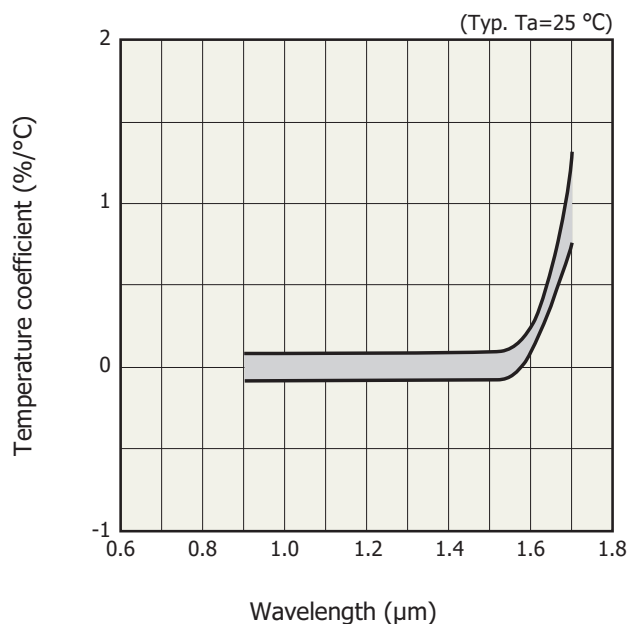
KIRDB0184EA

Spectral response shifts towards the short wavelength side when cooled.

One-stage TE-cooled type: $\lambda_c=1.67\text{ }\mu\text{m}$

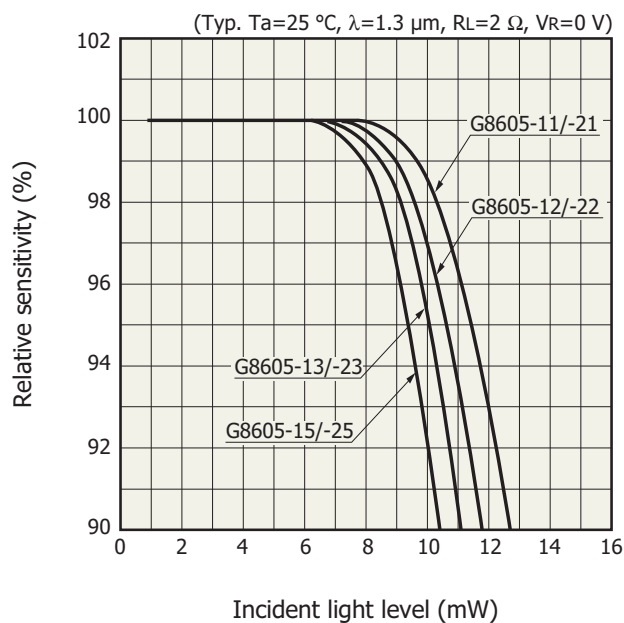
Two-stage TE-cooled type: $\lambda_c=1.65\text{ }\mu\text{m}$

Photo sensitivity temperature characteristic



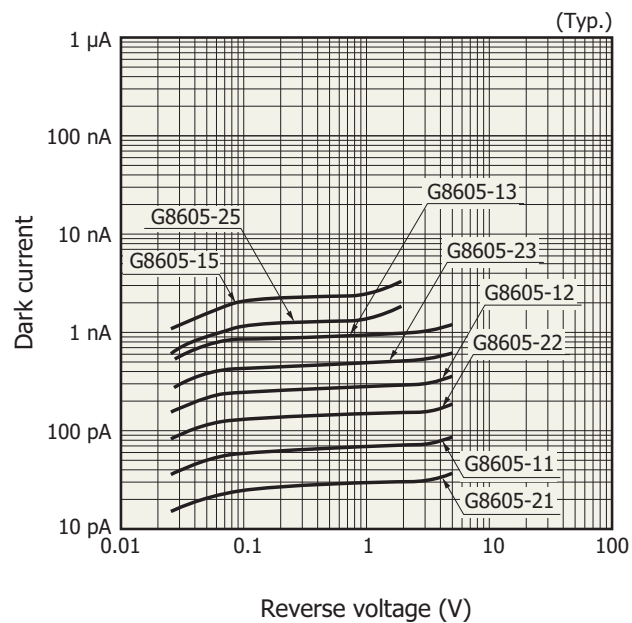
KIRDB0042EA

Photo sensitivity linearity



KIRDB0241EA

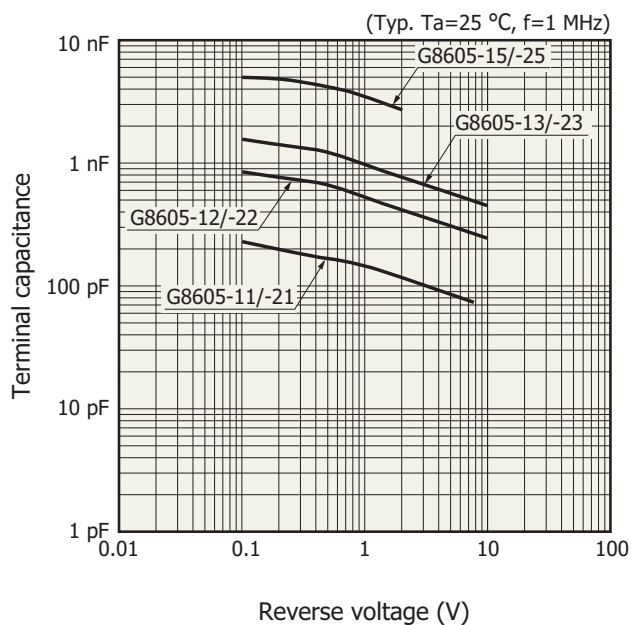
Dark current vs. reverse voltage



KIRDB0242EB

Applying a reverse voltage increases dark current, but improves frequency characteristics and output linearity.

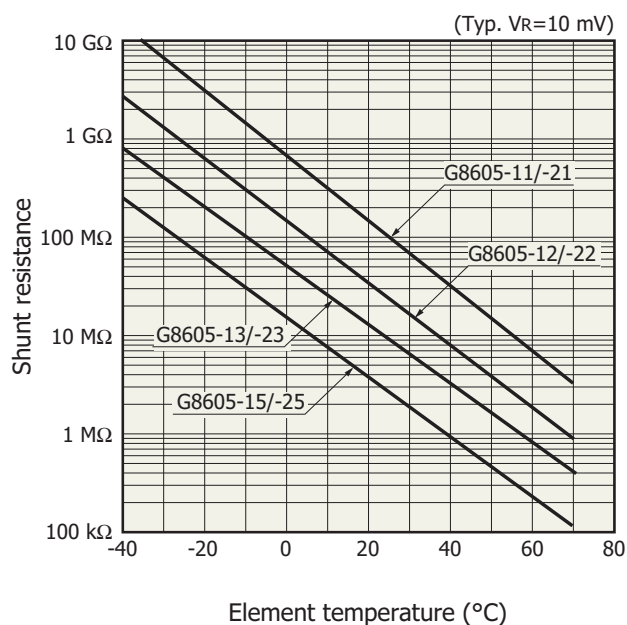
Terminal capacitance vs. reverse voltage



KIRD80243EA

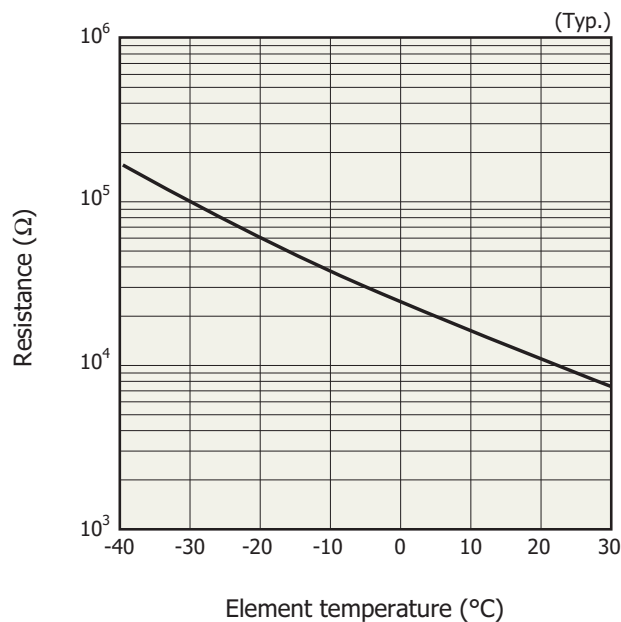
In applications requiring high-speed response, the lead length should be as short as possible to minimize the terminal capacitance.

Shunt resistance vs. element temperature



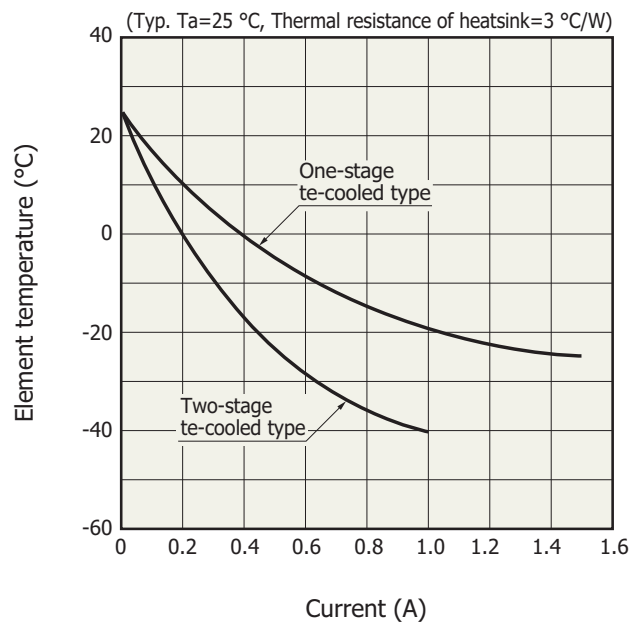
KIRD80244EB

Thermistor temperature characteristic



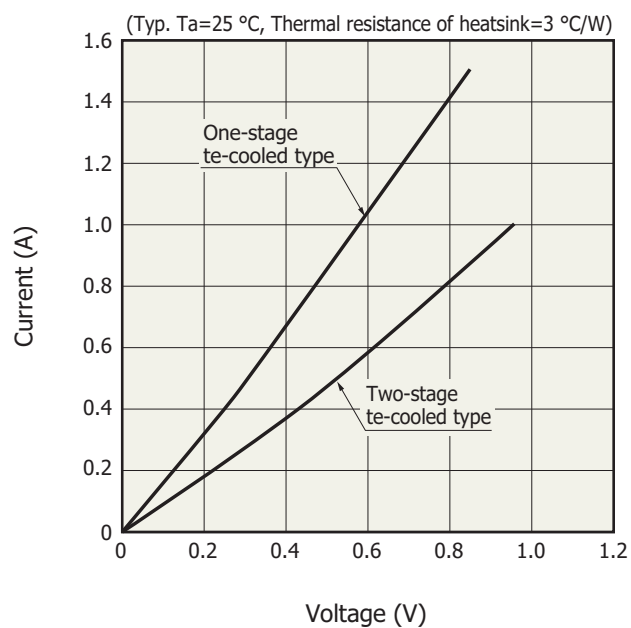
KIRD80116EA

Cooling characteristics of TE-cooler



KIRD80231EA

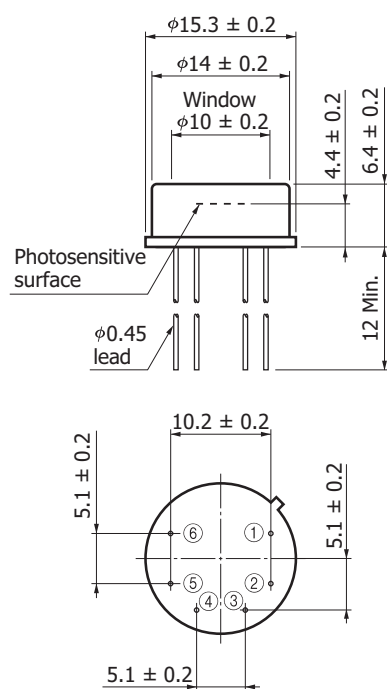
Current vs. voltage (TE-cooler)



KIRDB0115EB

Dimensional outlines (unit: mm)

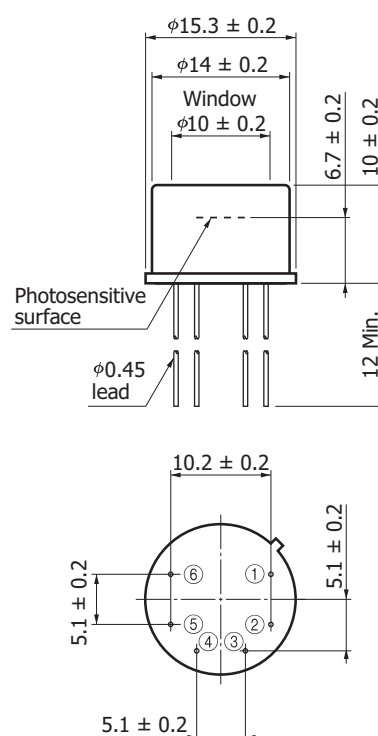
① G8605-11/-12/-13/-15



- ① Detector (anode)
- ② Detector (cathode)
- ③ TE-cooler (-)
- ④ TE-cooler (+)
- ⑤⑥ Thermistor

KIRDA0152EB

② G8605-21/-22/-23/-25



- ① Detector (anode)
- ② Detector (cathode)
- ③ TE-cooler (-)
- ④ TE-cooler (+)
- ⑤⑥ Thermistor

KIRDA0153EB

Information described in this material is current as of June, 2011. Product specifications are subject to change without prior notice due to improvements or other reasons. Before assembly into final products, please contact us for the delivery specification sheet to check the latest information.

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.

Copying or reprinting the contents described in this material in whole or in part is prohibited without our prior permission.

HAMAMATSUwww.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: Smidesvägen 12, SE-171 41 Solna, 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