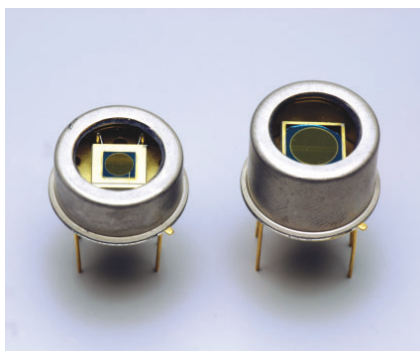


InGaAs PIN photodiodes



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

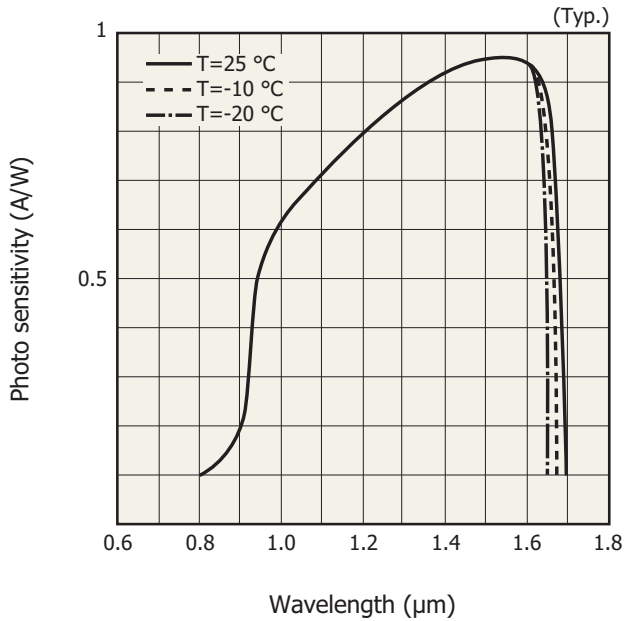
Type No.	Dimensional outline/ Window material *	Package	Cooling	Active area (mm)	Absolute maximum ratings					
					Thermistor power dissipation (mW)	TE-cooler allowable current (A)	Reverse voltage V_R Max. (V)	Operating temperature T_{opr} (°C)	Storage temperature T_{stg} (°C)	
G8605-11	①/K	TO-8	One-stage TE-cooled	$\phi 1$	0.2	1.5	5	-40 to +70	-55 to +85	
G8605-12				$\phi 2$			5			
G8605-13				$\phi 3$			5			
G8605-15				$\phi 5$			2			
G8605-21	②/K		Two-stage TE-cooled	$\phi 1$			1.0			5
G8605-22				$\phi 2$						5
G8605-23				$\phi 3$						5
G8605-25				$\phi 5$						2

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

Electrical and optical characteristics (Typ. unless otherwise noted)

Type No.	Measurement condition	Spectral response range λ (μm)	Peak sensitivity wavelength λ_p (μm)	Photo sensitivity S		Dark current I_D $V_R=1$ V		Cut-off frequency f_c $V_R=1$ V $R_L=50$ Ω (MHz)	Terminal capacitance C_t $V_R=1$ V $f=1$ MHz (pF)	Shunt resistance R_{sh} $V_R=10$ mV (M Ω)	D^* $\lambda=\lambda_p$ ($\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$)	NEP $\lambda=\lambda_p$ ($\text{W}/\text{Hz}^{1/2}$)
	Element temperature (°C)			1.3 μm (A/W)	$\lambda=\lambda_p$ (A/W)	Typ. (nA)	Max. (nA)					
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	1.55	0.9	0.95		0.03
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}	

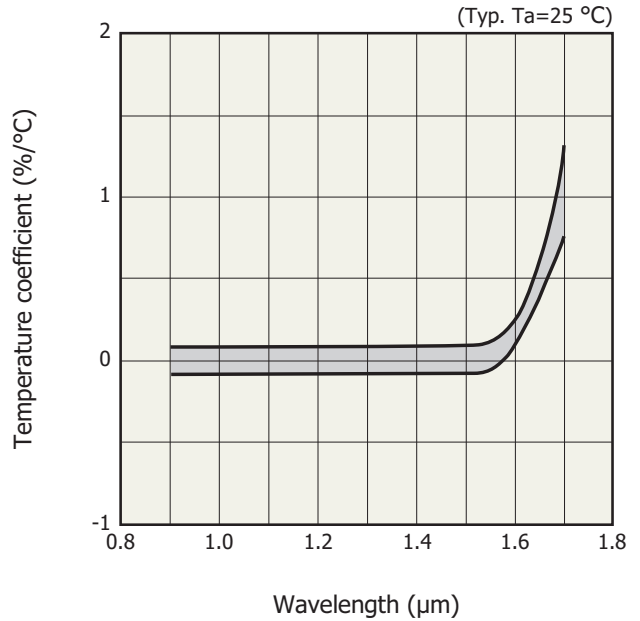
Spectral response



KIRDB0184EA

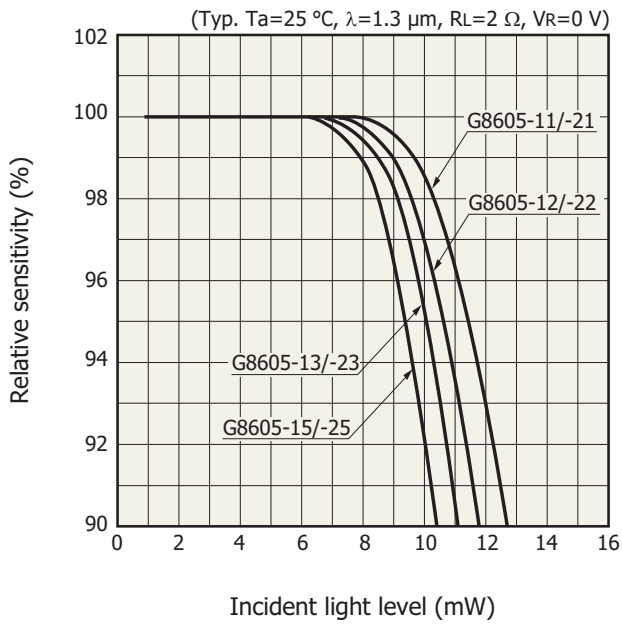
Spectral response shifts towards the short wavelength side when cooled.
 One-stage TE-cooled type: $\lambda_c=1.67\text{ }\mu\text{m}$
 Two-stage TE-cooled type: $\lambda_c=1.65\text{ }\mu\text{m}$

Photo sensitivity temperature characteristic



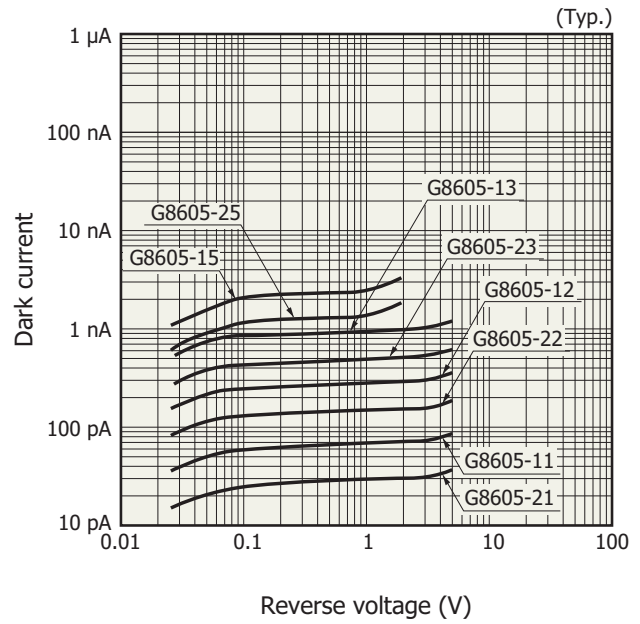
KIRDB0042EA

Photo sensitivity linearity



KIRDB0241EA

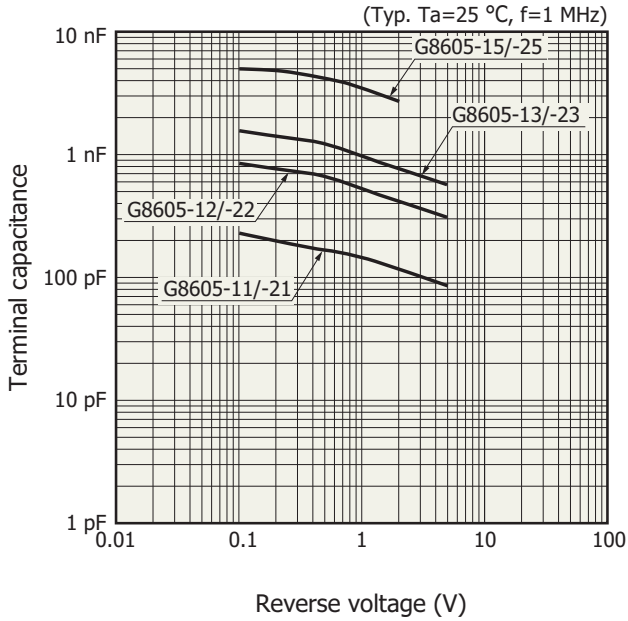
Dark current vs. reverse voltage



KIRDB0242EB

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

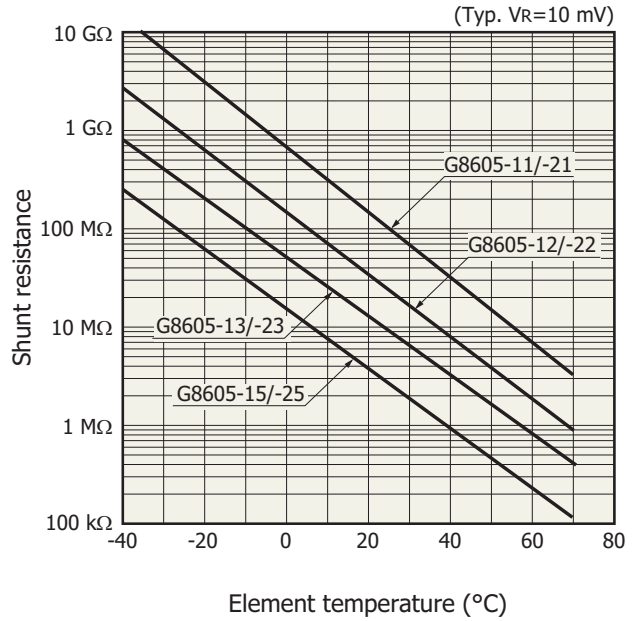
Terminal capacitance vs. reverse voltage



KIRDB0243EB

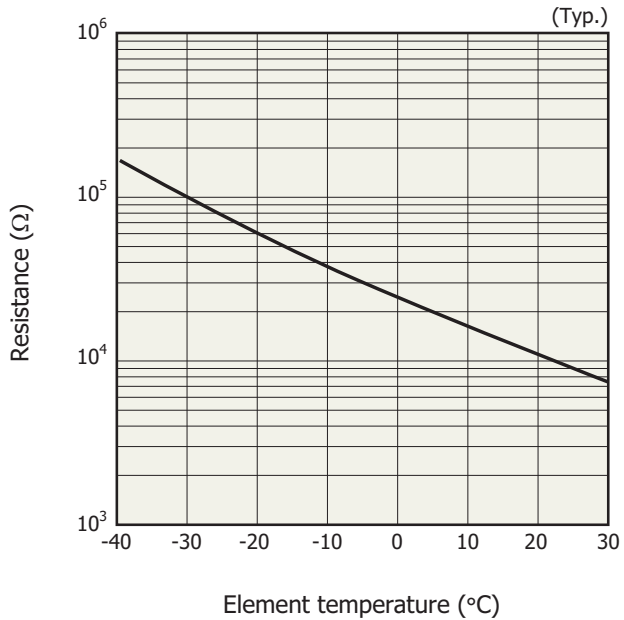
In applications requiring high-speed response, the lead length should be as short as possible to minimize the terminal capacitance.

Shunt resistance vs. element temperature



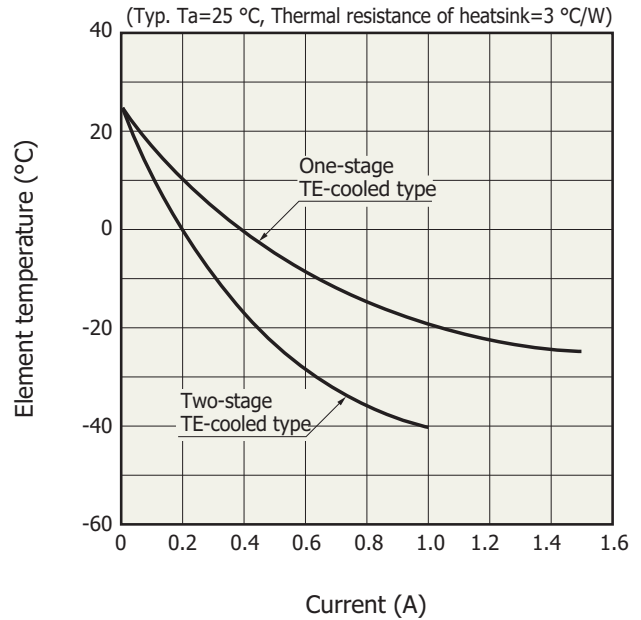
KIRDB0244EB

Thermistor temperature characteristic



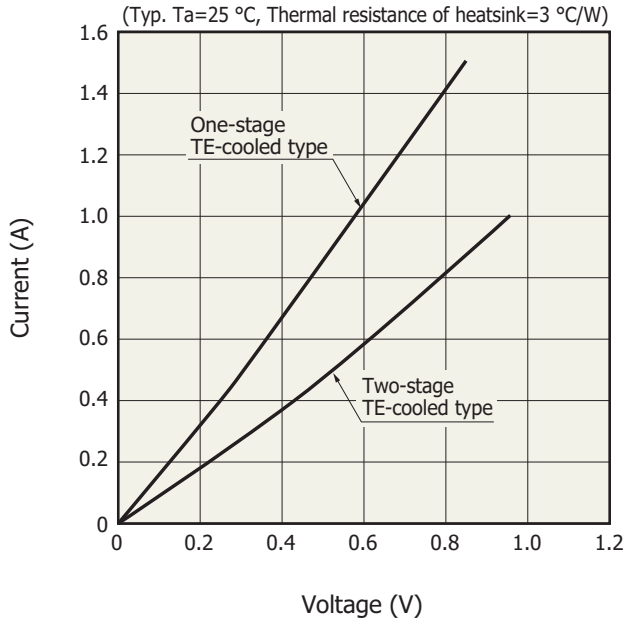
KIRDB0116EA

Cooling characteristics of TE-cooler



KIRDB0231EA

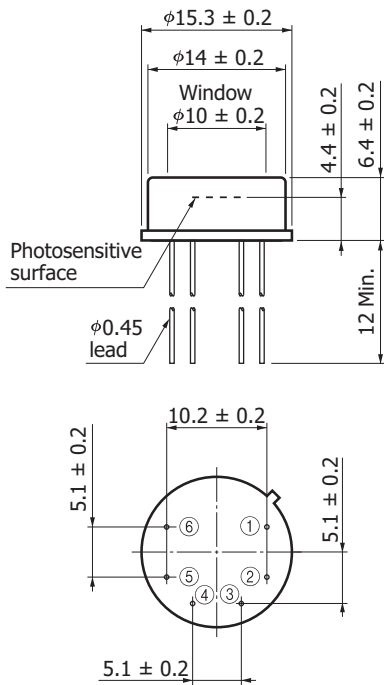
Current vs. voltage (TE-cooler)



KIRD80115EB

Dimensional outlines (unit: mm)

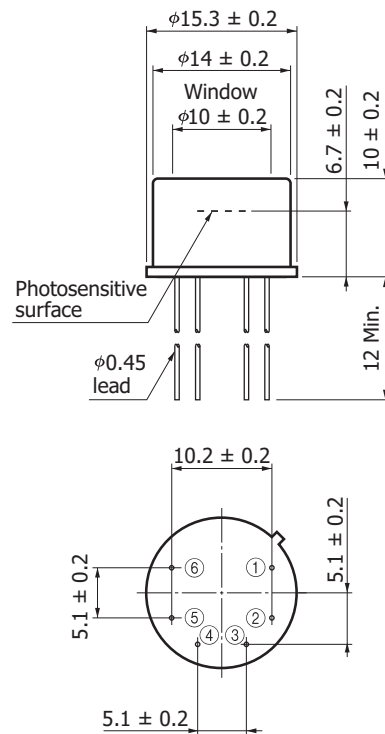
① G8605-11/-12/-13/-15



- 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

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 July, 2013.

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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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