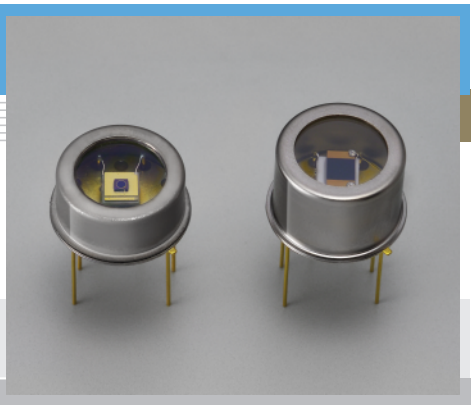
InGaAs PIN photodiode
G8605 series



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. 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 ϕ1 to ϕ5 mm

Applications

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

Accessories (Optional)

- Preamp for InGaAs PIN photodiode (High-speed type) C4159-02
- Preamp for InGaAs PIN photodiode (High sensitivity type) 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 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		

■ Electrical and optical characteristics (Typ. unless otherwise noted)

Type No.	Measurement condition: Element temperature (°C)	Spectral response range λ (μm)	Peak sensitivity wavelength λp (μm)	Photo sensitivity S: 1.3 μm (A/W)	Photo sensitivity S: λ=λp (A/W)	Dark current I_D V_R=1 V: Typ. (nA)	Dark current I_D V_R=1 V: Max. (nA)	Cut-off frequency fc V_R=1 V R_L=50 Ω (MHz)	Terminal capacitance Ct V_R=1 V f=1 MHz (pF)	Shunt resistance Rsh V_R=10 mV (MΩ)	D* λ=λp (cm·Hz$^{1/2}$/W)	NEP λ=λp (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}

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

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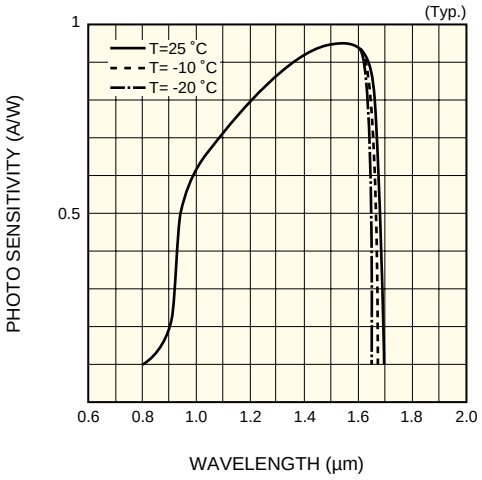
■ Spectral response



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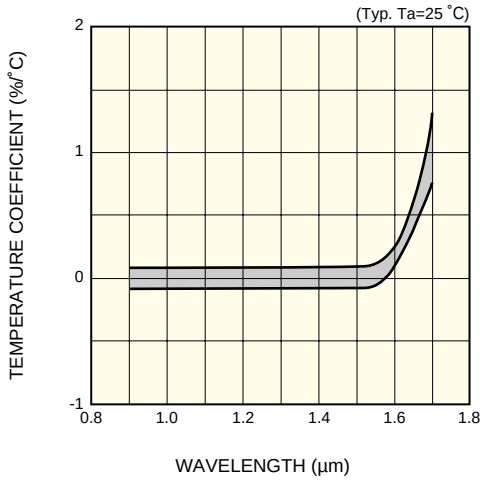
Spectral response shifts towards the short wavelength side when cooled.
One-stage TE-cooled type: λc=1.67 µm
Two-stage TE-cooled type: λc=1.65 µm

■ Photo sensitivity temperature characteristic



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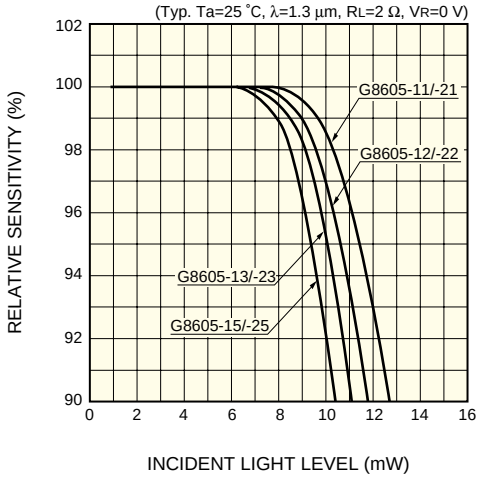
■ Photo sensitivity linearity



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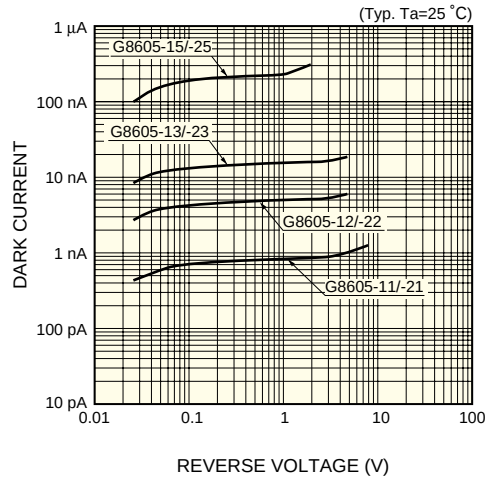
■ Dark current vs. reverse voltage



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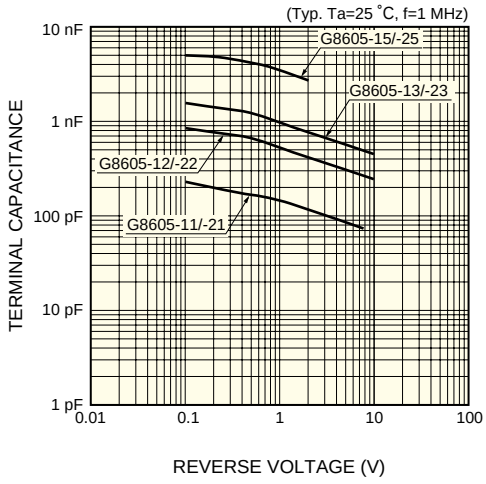
Applying a reverse voltage increases dark current, but improves frequency characteristics and output linearity.

■ Terminal capacitance vs. reverse voltage



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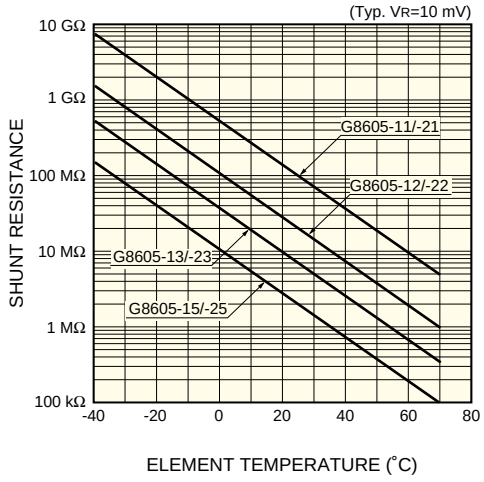
In applications requiring high-speed response, the lead length should be as short as possible to minimize the terminal capacitance.

■ Shunt resistance vs. element temperature



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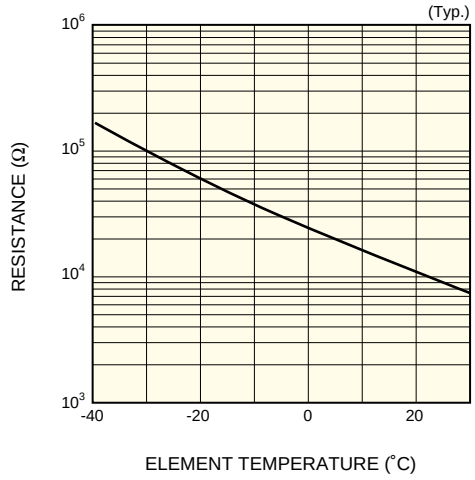
■ Thermistor temperature characteristic



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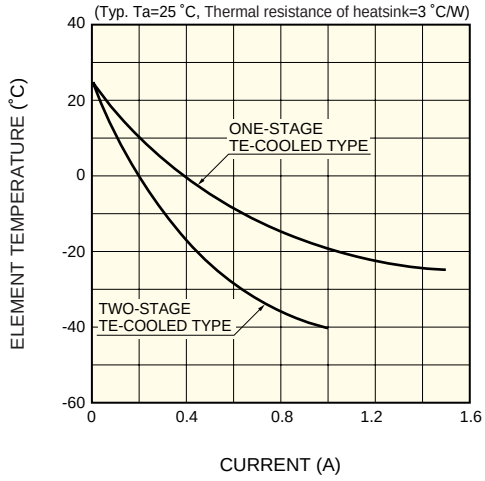
■ Cooling characteristics of TE-cooler



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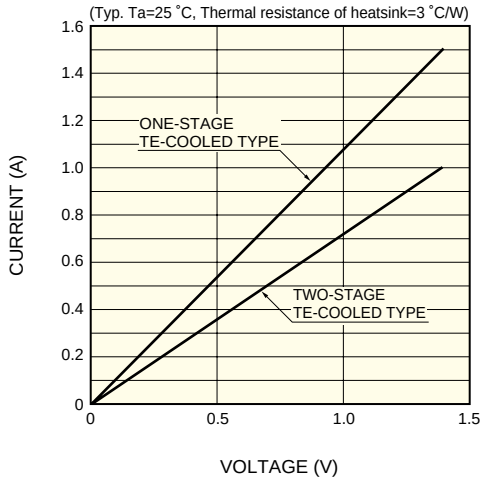
■ Current vs. voltage characteristics of TE-cooler



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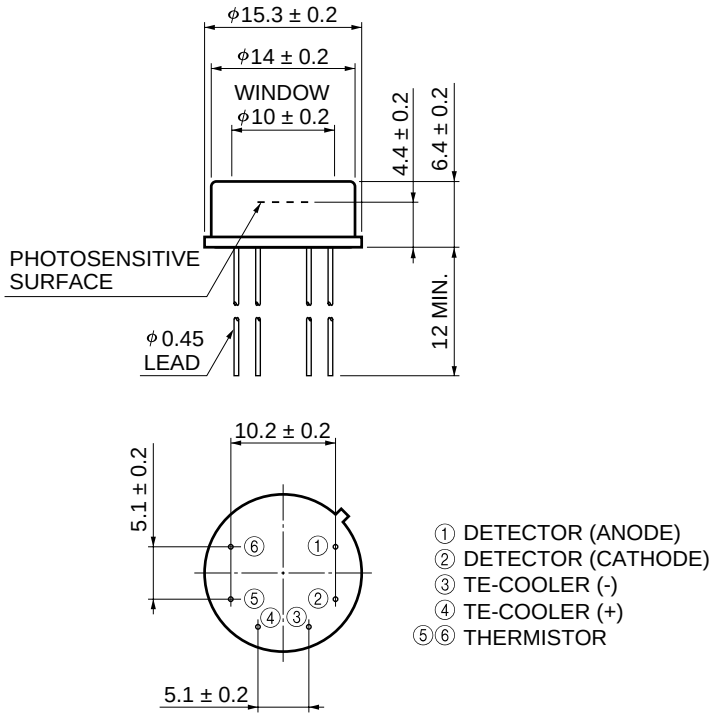
■ Dimensional outlines (unit: mm)

① G8605-11/-12/-13/-15



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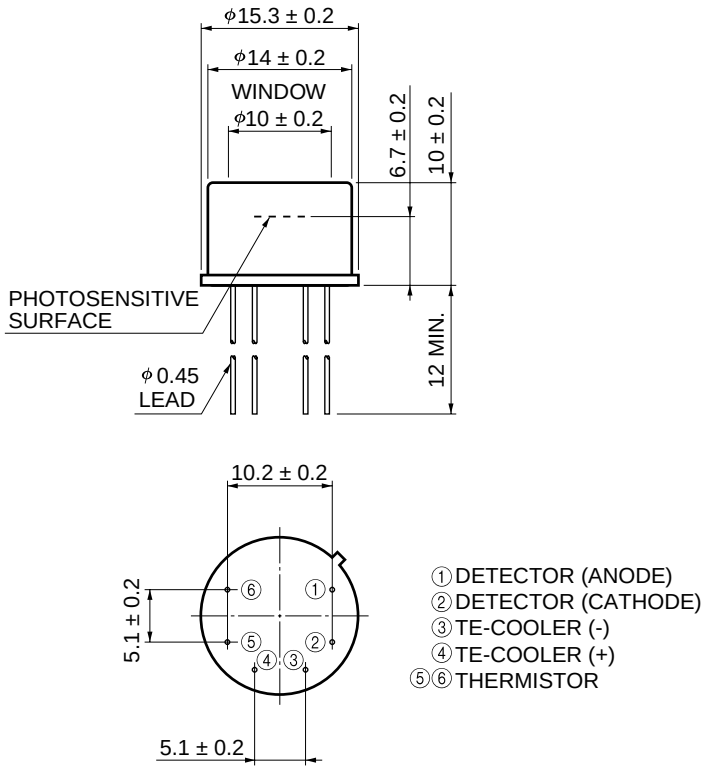
② G8605-21/-22/-23/-25



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