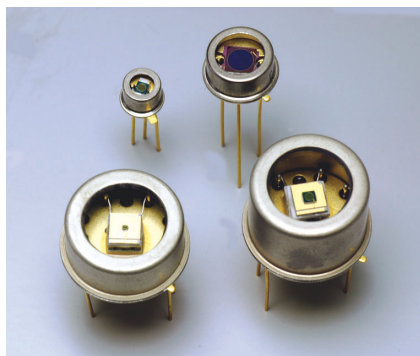


InGaAs PIN photodiodes



G12182 series

Long wavelength type (cutoff wavelength: 2.05 to 2.1 μm)

Features

- Cutoff wavelength: 2.05 to 2.1 μm
- Low cost
- Photosensitive area: φ0.3 to φ3 mm
- Low noise
- High sensitivity
- High reliability
- High-speed response

Applications

- Optical power meters
- Gas analyzers
- Moisture meters
- NIR (near infrared) photometry

Options

- Amplifier 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**

Structure / Absolute maximum ratings

Type no.	Dimensional outline /Window material*1	Package	Cooling	Photosensitive area (mm)	Absolute maximum ratings						
					Thermister power dissipation (mW)	TE-cooler allowable current (A)	TE-cooler allowable voltage (V)	Reverse voltage Vr max (V)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)	Soldering conditions
G12182-003K	(1)/B	TO-18	Non-cooled	φ0.3	-	-	-	-	-40 to +85*2	-55 to +125*2	260 °C or less, within 10 s
G12182-005K				φ0.5							
G12182-010K				φ1							
G12182-020K	(2)/B	TO-5	Non-cooled	φ2	0.2	1.5	1.0	1	-40 to +70*2	-55 to +85*2	
G12182-030K				φ3							
G12182-103K				(3)/B							
G12182-105K	φ0.5										
G12182-110K	φ1										
G12182-120K	(4)/B	TO-8	Two-stage TE-cooled	φ2	1.0	1.2	-	-	-	-	
G12182-130K				φ3							
G12182-203K				φ0.3							
G12182-205K				φ0.5							
G12182-210K				φ1							
G12182-220K	φ2										
G12182-230K	φ3										

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.

*1: B=Borosilicate glass

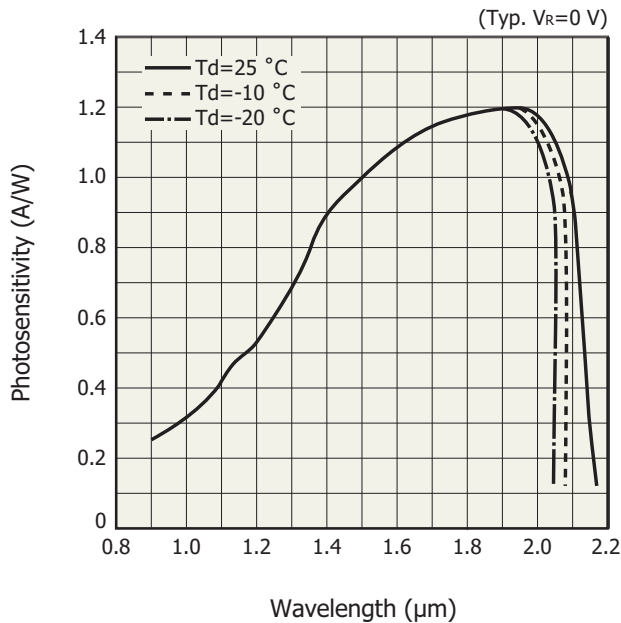
*2: No condensation

The G12182 series may be destroyed or deteriorated by electrostatic discharge, etc. Be carefull when using the G12182 series.

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

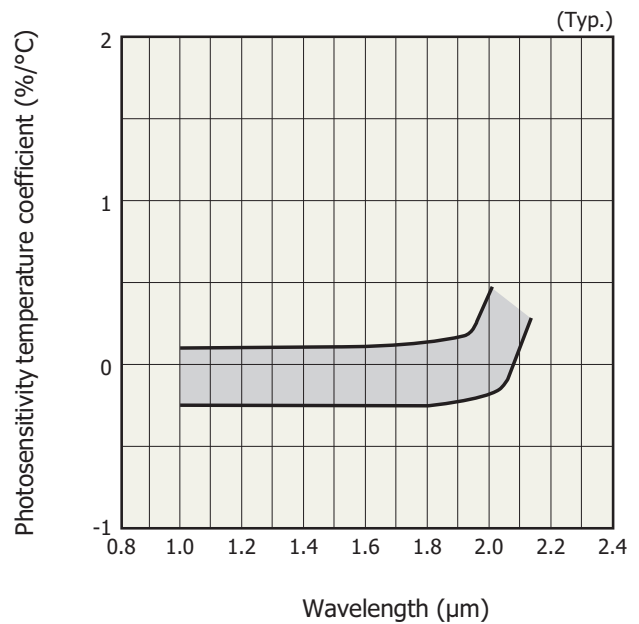
Type no.	Measurement Condition	Spectral response range λ (μm)	Peak sensitivity wavelength λ_p (μm)	Photo sensitivity S $\lambda = \lambda_p$		Dark current I_D $V_R = 0.5 \text{ V}$		Temp. coefficient of I_D $V_R = 0.5 \text{ V}$	Cutoff frequency f_c $V_R = 0 \text{ V}$ $R_L = 50 \Omega$		Terminal capacitance C_t $V_R = 0 \text{ V}$ $f = 1 \text{ MHz}$		Shunt resistance R_{sh} $V_R = 10 \text{ mV}$		Detectivity D^* $\lambda = \lambda_p$		Noise equivalent power NEP $\lambda = \lambda_p$												
	Element temperature ($^{\circ}\text{C}$)			Min. (A/W)	Typ. (A/W)	Typ. (nA)	Max. (nA)		Min. (MHz)	Typ. (MHz)	Typ. (pF)	Max. (pF)	Min. (M Ω)	Typ. (M Ω)	Min. (cm \cdot Hz $^{1/2}$ /W)	Typ. (cm \cdot Hz $^{1/2}$ /W)	Typ. (W/Hz $^{1/2}$)	Max. (W/Hz $^{1/2}$)											
G12182-003K	25	0.9 to 2.1	1.95	1	1.2	1.07																							
G12182-005K																				10	100	40	90	25	50	0.65	3	6.5×10^{-14}	2×10^{-13}
G12182-010K																				20	200	15	35	70	150	0.2	1	1.5×10^{-13}	3.5×10^{-13}
G12182-020K																				100	1000	5	10	230	500	0.05	0.25	2.5×10^{-13}	6.5×10^{-13}
G12182-030K																				500	5000	1.2	2.5	1000	2000	0.01	0.05	5.5×10^{-13}	1.5×10^{-12}
G12182-103K	-10	0.9 to 2.07	1.95	1	1.2	1.07																							
G12182-105K																				1	10	40	140	22	50	10	50	1.5×10^{-14}	4.5×10^{-14}
G12182-110K																				3	30	15	50	64	150	2.8	14	3×10^{-14}	8×10^{-14}
G12182-120K																				10	100	5	16	200	500	0.6	3	5.5×10^{-14}	1.5×10^{-13}
G12182-130K																				50	500	1.2	3.5	900	2000	0.13	0.65	1.5×10^{-13}	4×10^{-13}
G12182-203K	-20	0.9 to 2.05	1.95	1	1.2	1.07																							
G12182-205K																				100	1000	1	1.8	1800	3000	0.055	0.28	2×10^{-13}	5.5×10^{-13}
G12182-210K																				0.5	5	40	150	20	50	20	100	1×10^{-14}	3×10^{-14}
G12182-220K																				1.5	15	15	53	60	150	5.5	28	2×10^{-14}	5.5×10^{-14}
G12182-230K																				5	50	5	17	195	500	1.4	7	4×10^{-14}	1×10^{-13}

Spectral response



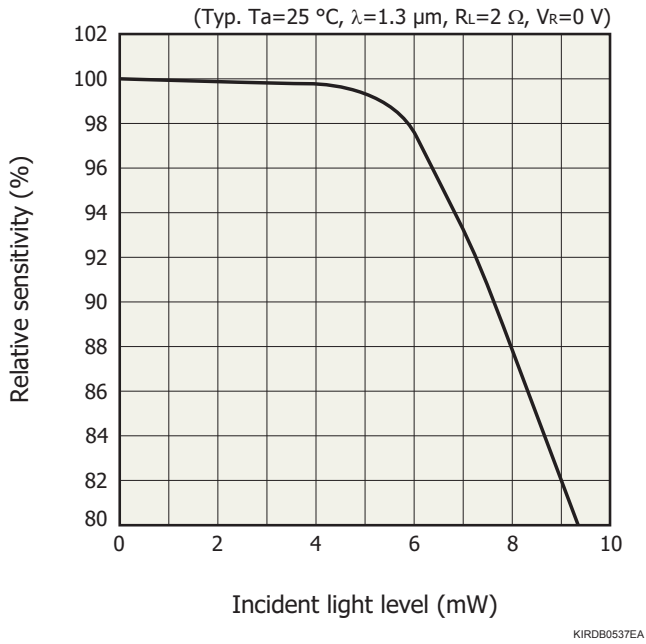
KIRD00487EC

Photosensitivity temperature characteristics



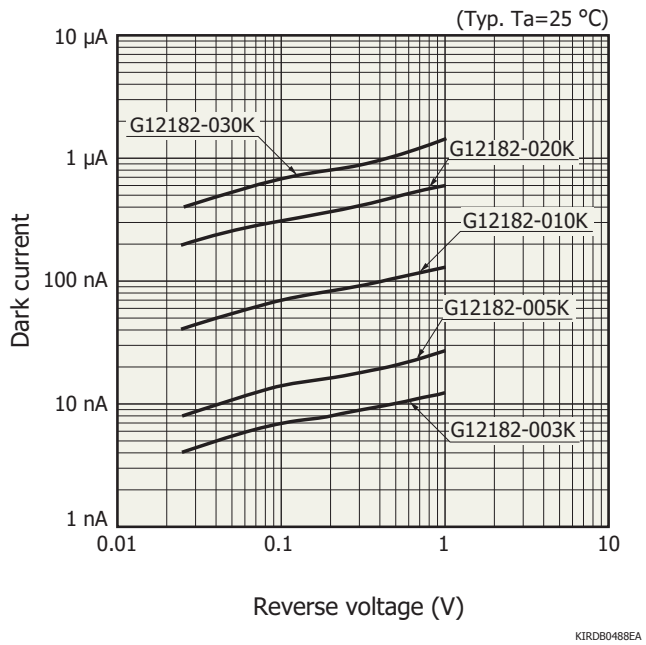
KIRD00207EA

Linearly (G12182-010K)

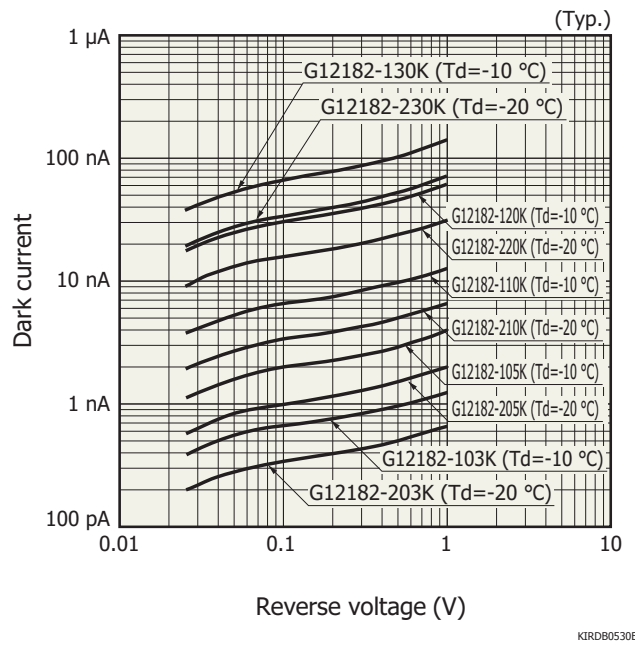


Dark current vs. reverse voltage

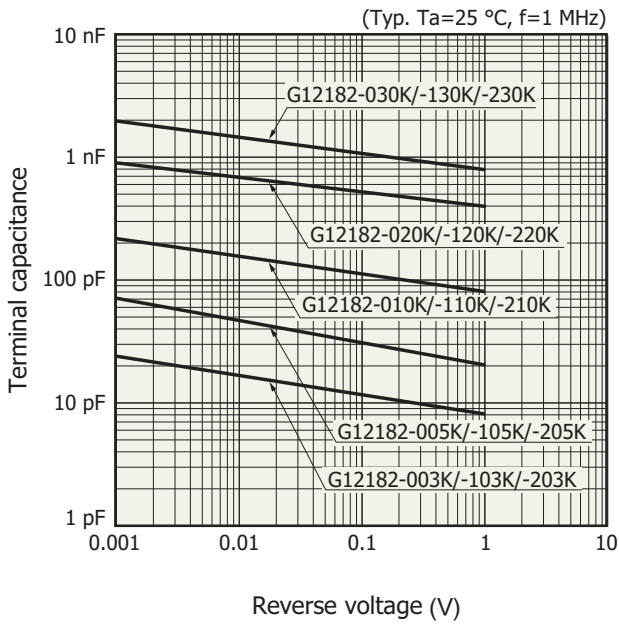
Non-cooled type



TE-cooled type

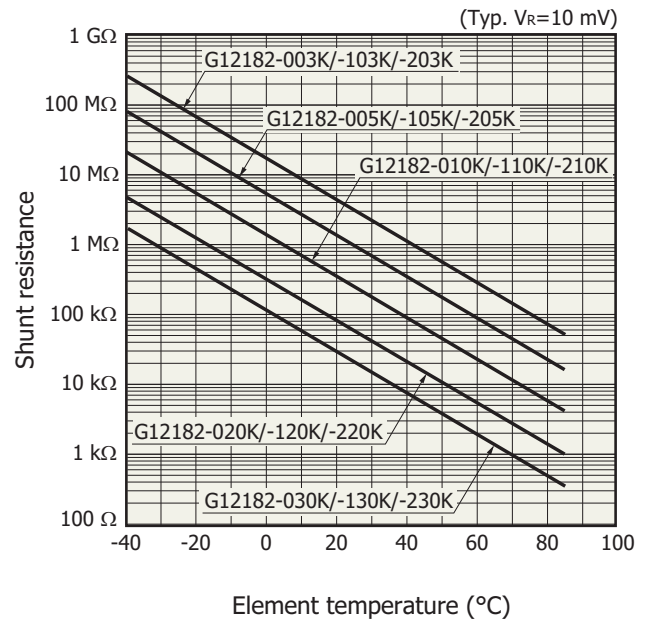


Terminal capacitance vs. reverse voltage



KIRD0489EB

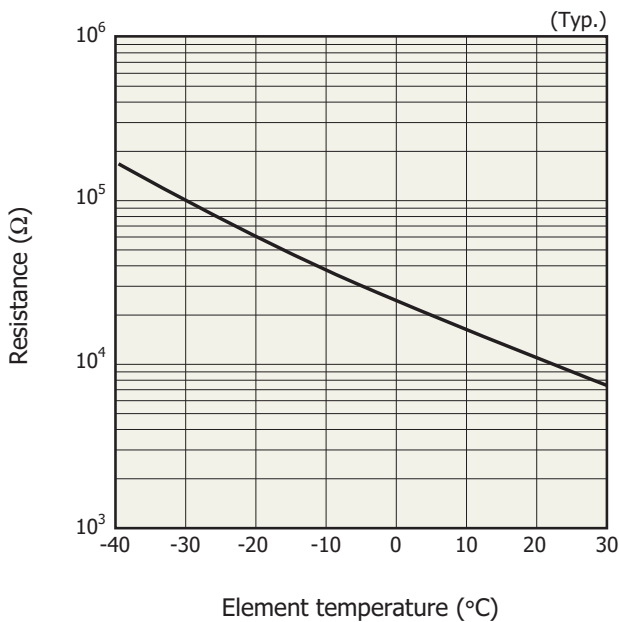
Shunt resistance vs. element temperature



KIRD0490EB

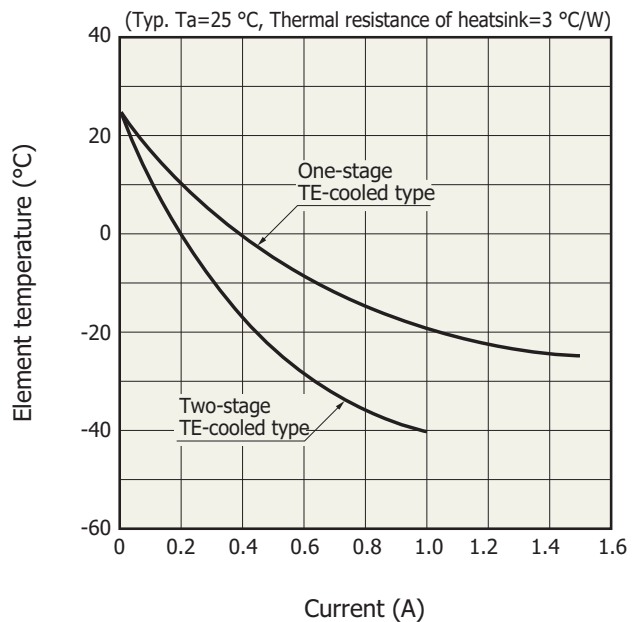
The operating temperature for one-stage and two-stage TE-cooled types is up to 70 °C.

Thermistor temperature characteristics



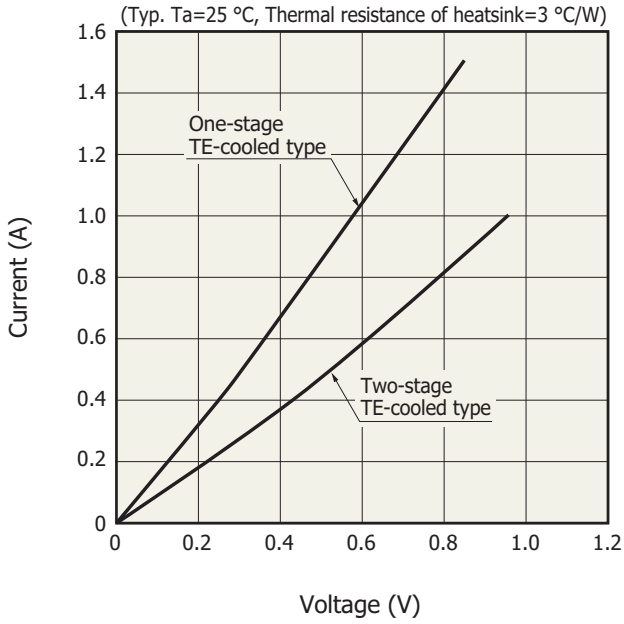
KIRD0116EA

Cooling characteristics of TE-cooler



KIRD0231EA

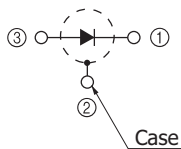
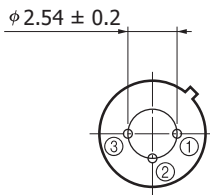
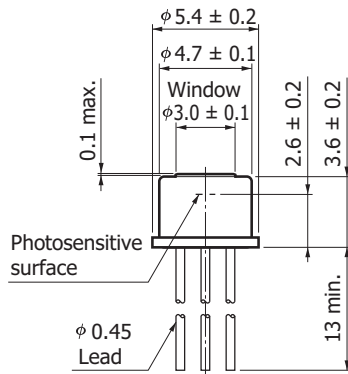
Current vs. voltage (TE-cooler)



KIRDB0115EB

Dimensional outlines (unit: mm)

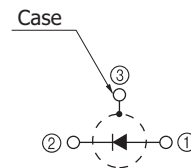
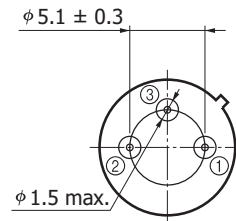
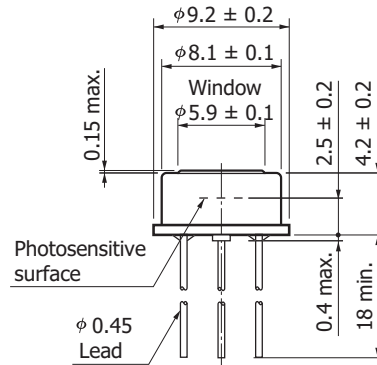
① G12182-003K/-005K/-010K



Distance from photosensitive area center to cap center
 $-0.2 \leq X \leq +0.2$
 $-0.2 \leq Y \leq +0.2$

KIRDA0220EA

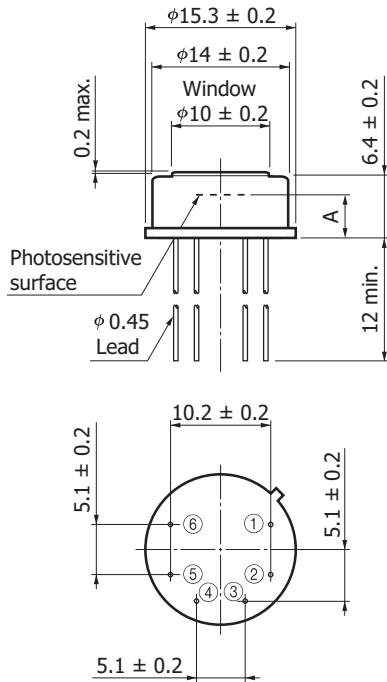
② G12182-020K/-030K



Distance from photosensitive area center to cap center
 $-0.2 \leq X \leq +0.2$
 $-0.2 \leq Y \leq +0.2$

KIRDA0221EA

(3) G12182-103K/-105K/-110K/-120K/-130K



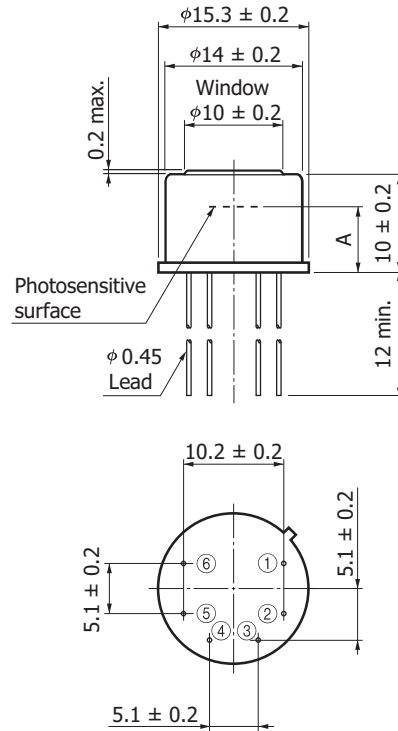
- ① Detector (anode)
- ② Detector (cathode)
- ③ TE-cooler (-)
- ④ TE-cooler (+)
- ⑤⑥ Thermistor

Distance from photosensitive area center to cap center
 $-0.3 \leq X \leq +0.3$
 $-0.3 \leq Y \leq +0.3$

	G12182-103K /-105K/-110K	G12182-120K /-130K
A	4.3 ± 0.2	4.4 ± 0.2

KIRDA0226EA

(4) G12182-203K/-205K/-210K/-220K/-230K



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

Distance from photosensitive area center to cap center
 $-0.3 \leq X \leq +0.3$
 $-0.3 \leq Y \leq +0.3$

	G12182-203K /-205K/-210K	G12182-220K /-230K
A	6.6 ± 0.2	6.7 ± 0.2

KIRDA0227EA

Information described in this material is current as of April, 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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