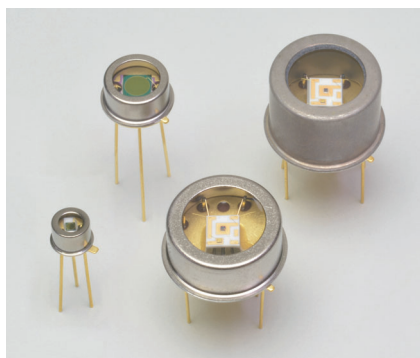




InGaAs PIN photodiodes

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: $\phi 0.3$ to $\phi 3$ 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

Type no.	Dimensional outline /Window material*1	Package	Cooling	Photosensitive area (mm)
G12182-003K	(1)/K	TO-18	Non-cooled	φ0.3
G12182-005K				φ0.5
G12182-010K				φ1
G12182-020K	(2)/K	TO-5		φ2
G12182-030K				φ3
G12182-103K				One-stage TE-cooled
G12182-105K	φ0.5			
G12182-110K	φ1			
G12182-120K	φ2			
G12182-130K	φ3			
G12182-203K	(4)/K	TO-8	Two-stage TE-cooled	
G12182-205K				φ0.5
G12182-210K				φ1
G12182-220K				φ2
G12182-230K				φ3

*1: K=Borosilicate glass

Absolute maximum ratings

Type no.	Thermister power dissipation Pd_th (mW)	TE-cooler allowable current ITE max (A)	TE-cooler allowable voltage VTE max (V)	Reverse voltage VR max (V)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)	Soldering conditions
G12182-003K	-	-	-	1	-40 to +85*2	-55 to +125*2	260 °C or less, within 10 s
G12182-005K							
G12182-010K							
G12182-020K							
G12182-030K							
G12182-103K	0.2	1.5	1.0		-40 to +70*2	-55 to +85*2	
G12182-105K							
G12182-110K							
G12182-120K							
G12182-130K							
G12182-203K		1.0	1.2				
G12182-205K							
G12182-210K							
G12182-220K							
G12182-230K							

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.

*2: No dew condensation

When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

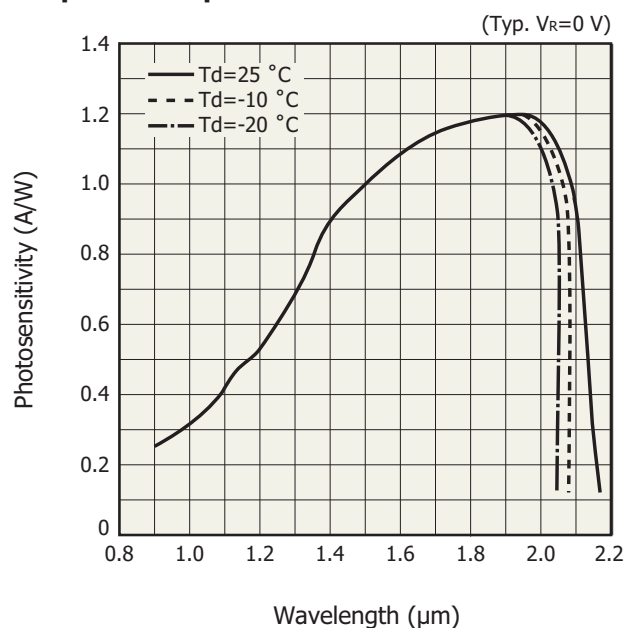
The G12182 series may be destroyed or deteriorated by electrostatic discharge, etc. Be carefull when using the G12182 series.

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

Type no.	Measurement Condition	Thermistor resistance Rth (kΩ)	Thermistor B constant B (K)	Spectral response range λ (μm)	Peak sensitivity wavelength λp (μm)	Photo sensitivity S λ=λp		Dark current ID VR=0.5 V		Temp. coefficient of ID VR=0.5 V (times/°C)			
	Element temperature Tchip (°C)					Min. (A/W)	Typ. (A/W)	Typ. (nA)	Max. (nA)				
G12182-003K	25	-	-	0.9 to 2.1	1.95	1	1.2	10	100	1.07			
G12182-005K								20	200				
G12182-010K								100	1000				
G12182-020K								500	5000				
G12182-030K								1000	10000				
G12182-103K	-10	9.0	3.3	0.9 to 2.07				1	10				
G12182-105K								3	30				
G12182-110K								10	100				
G12182-120K								50	500				
G12182-130K								100	1000				
G12182-203K	-20			0.9 to 2.05				0.5	5				
G12182-205K								1.5	15				
G12182-210K								5	50				
G12182-220K								25	250				
G12182-230K								50	500				

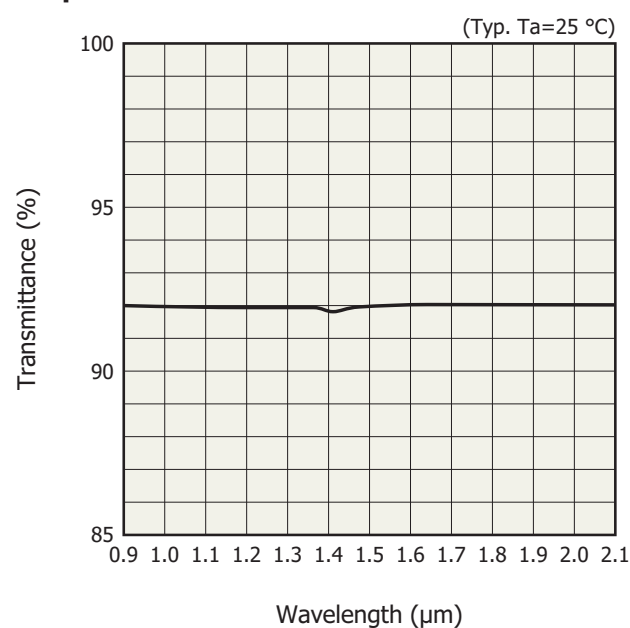
Type no.	Measurement Condition	Cutoff frequency fc		Terminal capacitance Ct		Shunt resistance Rsh		Detectivity D*		Noise equivalent power NEP	
	Element temperature	VR=0 V RL=50 Ω		VR=0 V f=1 MHz		VR=10 mV		$\lambda=\lambda_p$		$\lambda=\lambda_p$	
	Tchip (°C)	Min. (MHz)	Typ. (MHz)	Typ. (pF)	Max. (pF)	Min. (MΩ)	Typ. (MΩ)	Min. (cm·Hz ^{1/2} /W)	Typ. (cm·Hz ^{1/2} /W)	Typ. (W/Hz ^{1/2})	Max. (W/Hz ^{1/2})
G12182-003K	25	40	90	25	50	0.65	3	1×10^{11}	3.5×10^{11}	6.5×10^{-14}	2×10^{-13}
G12182-005K		15	35	70	150	0.2	1			1.5×10^{-13}	3.5×10^{-13}
G12182-010K		5	10	230	500	0.05	0.25			2.5×10^{-13}	6.5×10^{-13}
G12182-020K		1.2	2.5	1000	2000	0.01	0.05			5.5×10^{-13}	1.5×10^{-12}
G12182-030K		1	1.5	2000	3000	0.004	0.02			8.5×10^{-13}	2.5×10^{-12}
G12182-103K	-10	40	140	22	50	10	50	5×10^{11}	1.5×10^{12}	1.5×10^{-14}	4.5×10^{-14}
G12182-105K		15	50	64	150	2.8	14			3×10^{-14}	8×10^{-14}
G12182-110K		5	16	200	500	0.6	3			5.5×10^{-14}	1.5×10^{-13}
G12182-120K		1.2	3.5	900	2000	0.13	0.65			1.5×10^{-13}	4×10^{-13}
G12182-130K		1	1.8	1800	3000	0.055	0.28			2×10^{-13}	5.5×10^{-13}
G12182-203K	-20	40	150	20	50	20	100	7×10^{11}	2×10^{12}	1×10^{-14}	3×10^{-14}
G12182-205K		15	53	60	150	5.5	28			2×10^{-14}	5.5×10^{-14}
G12182-210K		5	17	195	500	1.4	7			4×10^{-14}	1×10^{-13}
G12182-220K		1.2	3.7	850	2000	0.28	1.4			9×10^{-14}	2.5×10^{-13}
G12182-230K		1	1.9	1700	3000	0.11	0.55			1.5×10^{-13}	4×10^{-13}

Spectral response



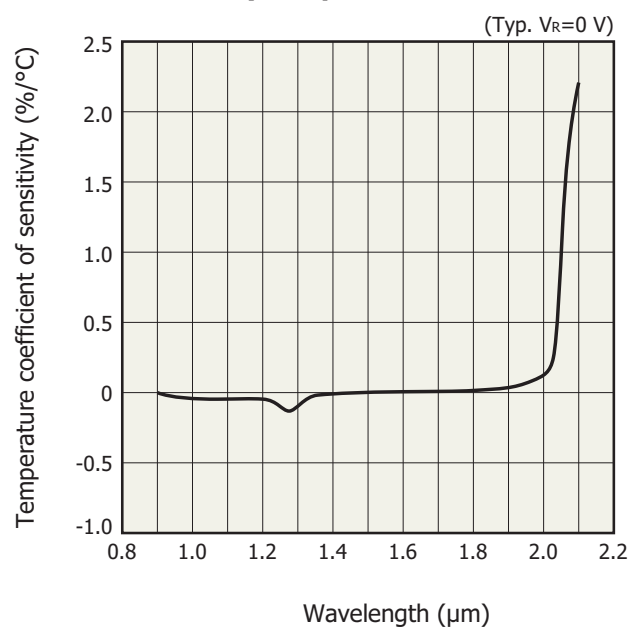
KIRDB0487EC

Spectral transmittance of window material

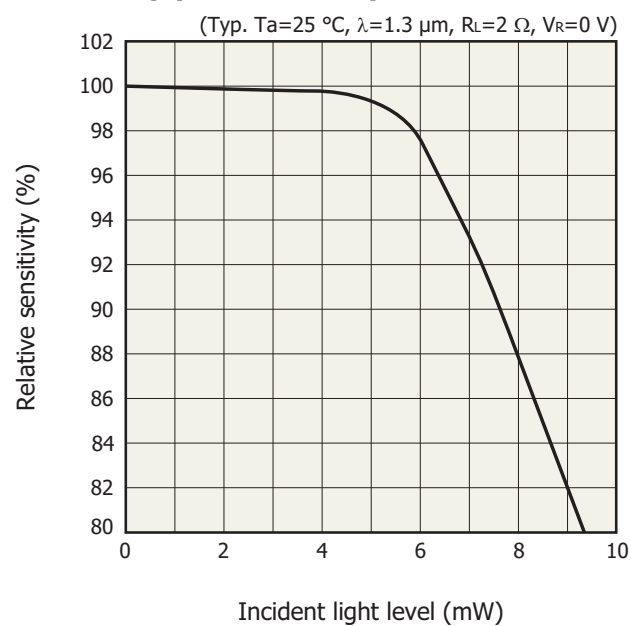


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Photosensitivity temperature characteristics

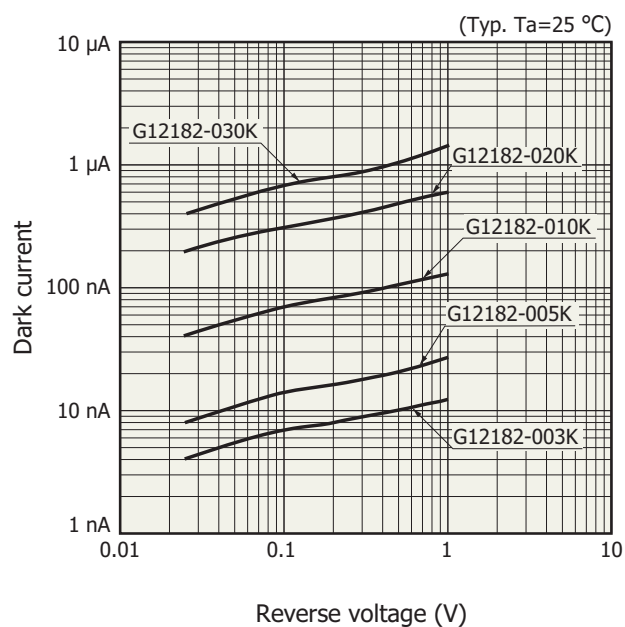


Linearity (G12182-010K)

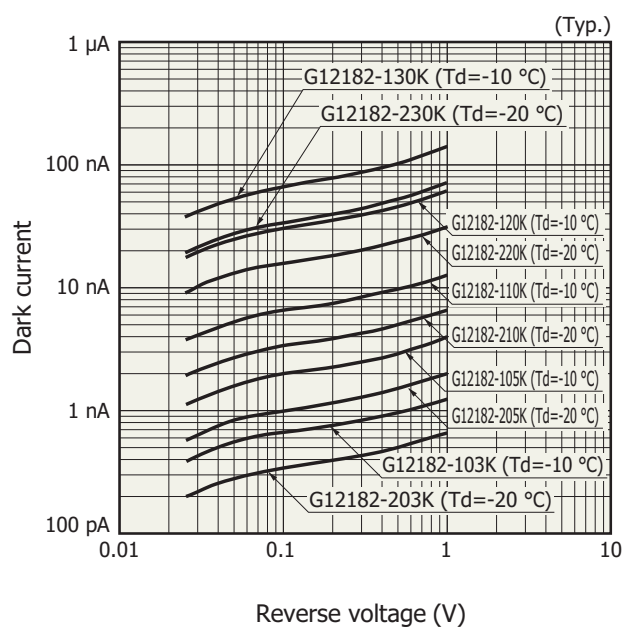


Dark current vs. reverse voltage

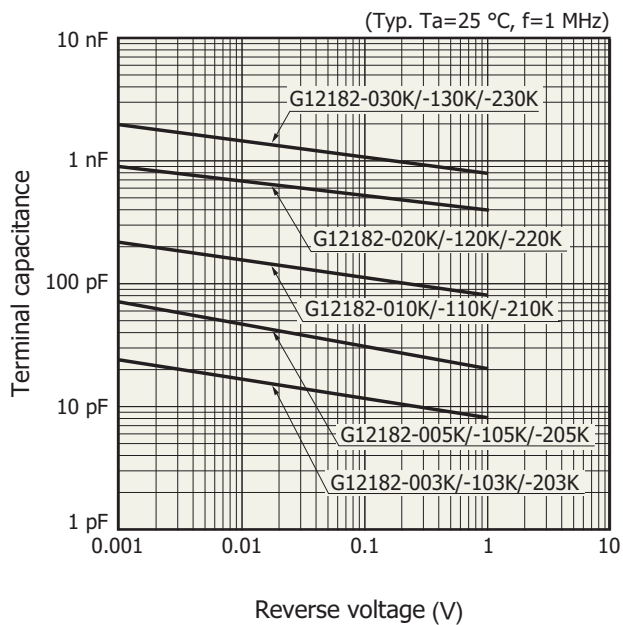
Non-cooled type



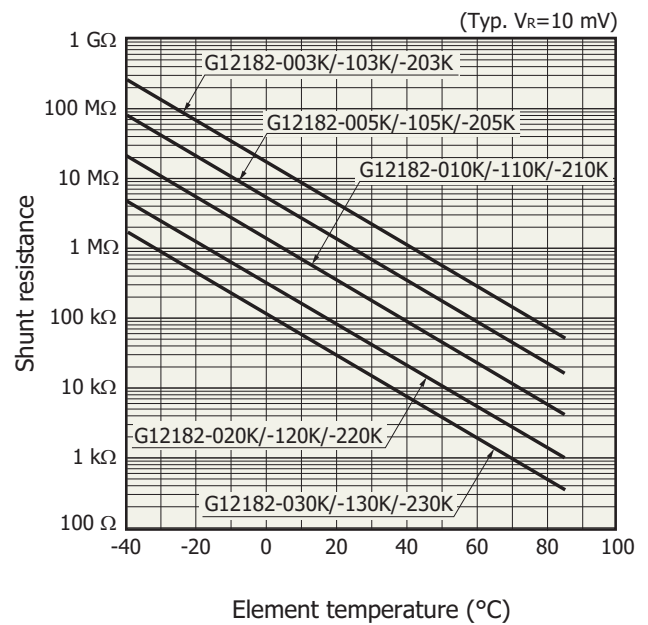
TE-cooled type



Terminal capacitance vs. reverse voltage

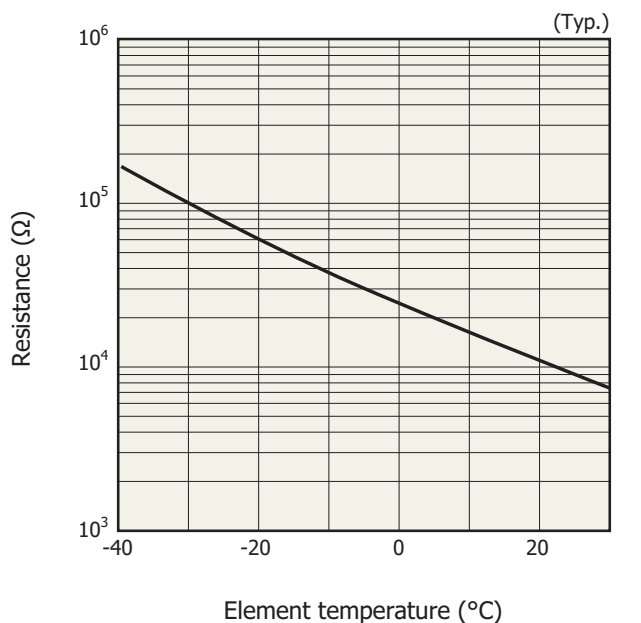


Shunt resistance vs. element temperature

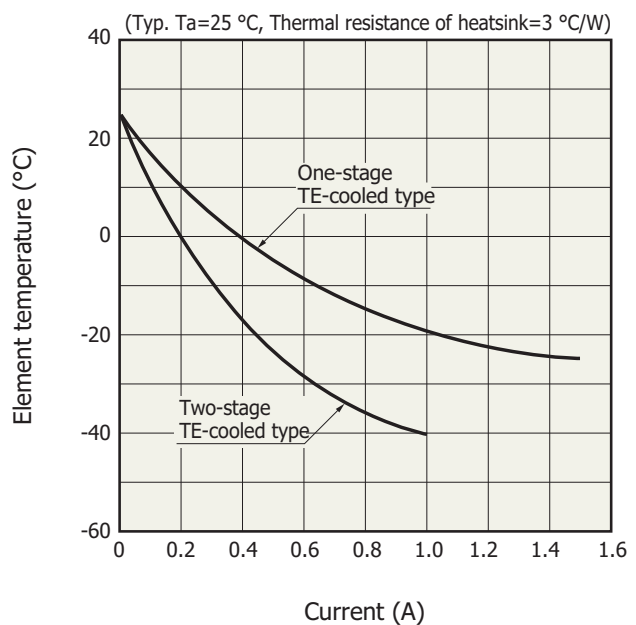


The operating temperature for one-stage and two-stage TE-cooled types is up to 70°C .

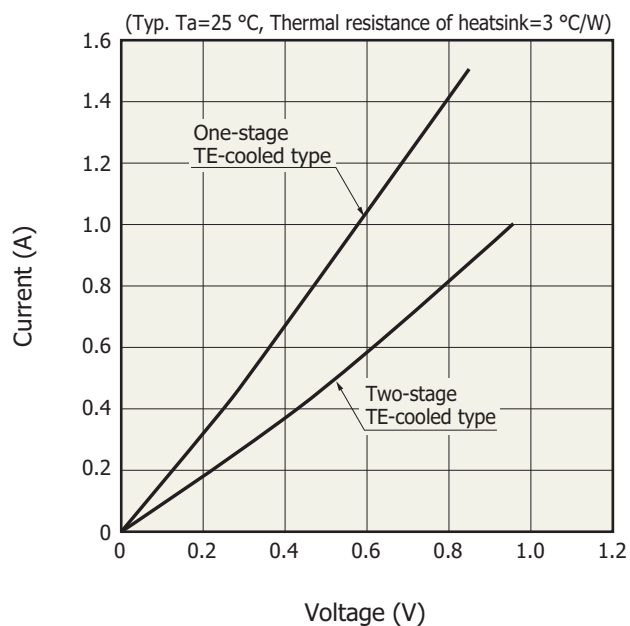
Thermistor temperature characteristics



Cooling characteristics of TE-cooler



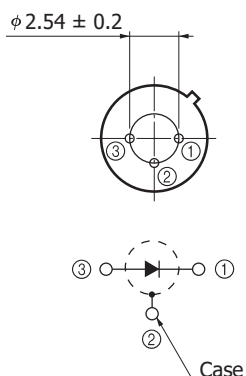
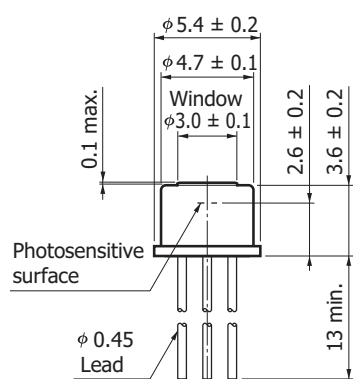
Current vs. voltage (TE-cooler)



KIRD80115EB

Dimensional outlines (unit: mm)

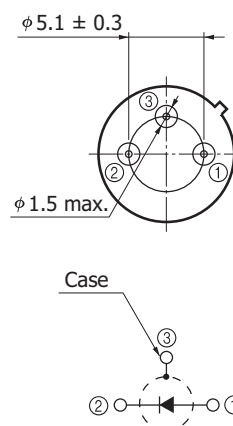
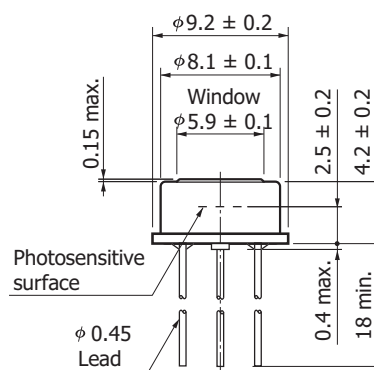
① G12182-003K/-005K/-010K



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

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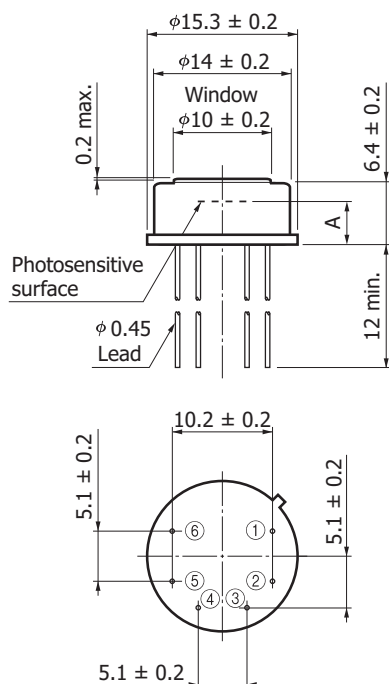
② G12182-020K/-030K



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

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



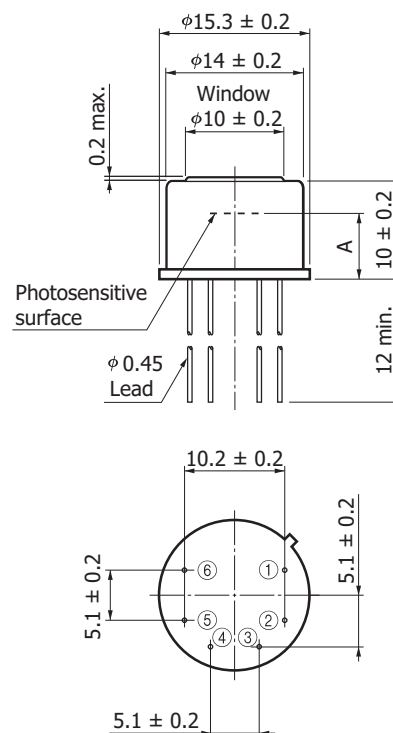
- ① Detector (anode)
 ② Detector (cathode)
 ③ TE-cooler (-)
 ④ TE-cooler (+)
 ⑤⑥ Thermistor

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

Related information

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

■ Precautions

- Disclaimer
- Safety consideration
- Metal, ceramic, plastic package products

Information described in this material is current as of March 2019.

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HAMAMATSU

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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, Bridgewater, N.J. 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218, E-mail: usa@hamamatsu.com

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8, E-mail: info@hamamatsu.de

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, E-mail: infos@hamamatsu.fr

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, E-mail: info@hamamatsu.co.uk

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01, E-mail: info@hamamatsu.se

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41, E-mail: info@hamamatsu.it

China: Hamamatsu Photonics (China) Co., Ltd.: B1201, Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R.China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866, E-mail: hpc@hamamatsu.com.cn

Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No. 158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)3-659-0080, Fax: (886)3-659-0081, E-mail: info@hamamatsu.com.tw