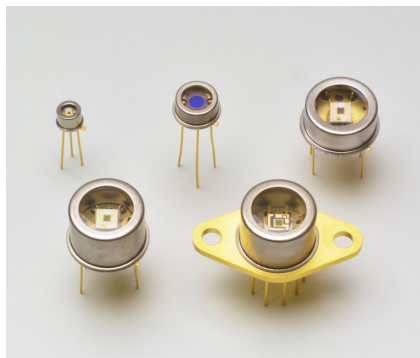


InGaAs PIN photodiodes

G12183 series



Long wavelength type (cutoff wavelength: 2.55 to 2.6 μm)

Features

- Cutoff wavelength: 2.55 to 2.6 μm
- Low cost
- Photosensitive area: φ0.3 to φ3 mm
- Low noise
- High sensitivity
- High reliability
- High-speed response
- High short-wavelength sensitivity
(G12183-210KA-03): 0.4 A/W (λ=900 nm)

Applications

- Optical power meters
- Gas analysis
- 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**
(excluding G12183-210KA-03)
- Temperature controller for TE-cooled type **C1103-04**

Structure

Type no.	Dimensional outline/ Window material*1	Package	Cooling	Photosensitive area (mm)
G12183-003K	(1)/K	TO-18	Non-cooled	φ0.3
G12183-005K				φ0.5
G12183-010K				φ1
G12183-020K	(2)/K	TO-5		φ2
G12183-030K				φ3
G12183-103K				(3)/K
G12183-105K	φ0.5			
G12183-110K	One-stage TE-cooled	φ1		
G12183-120K		φ2		
G12183-130K		φ3		
G12183-203K	(4)/K	TO-8	Two-stage TE-cooled	
G12183-205K				φ0.5
G12183-210K				φ1
G12183-220K				φ2
G12183-230K				φ3
G12183-210KA-03	(5)/K	TO-66	Two-stage TE-cooled	φ1

*1: K=borosilicate glass

The G12183 series may be destroyed or deteriorated by static electricity. Use caution when handling.

➤ Absolute maximum ratings (Ta=25 °C, unless otherwise noted)

Type no.	Thermistor power dissipation Pd_th (mW)	Allowable TE-cooler current I _{TE} max (A)	Allowable TE-cooler voltage V _{TE} max (V)	Reverse voltage V _R max (V)	Operating temperature* ² T _{opr} (°C)	Storage temperature* ² T _{stg} (°C)
G12183-003K	-	-	-		-40 to +85	-55 to +125
G12183-005K						
G12183-010K						
G12183-020K						
G12183-030K						
G12183-103K	0.2	1.5	1.0	1	-40 to +70* ³	-55 to +85
G12183-105K						
G12183-110K						
G12183-120K						
G12183-130K						
G12183-203K		1.0	1.2			
G12183-205K						
G12183-210K						
G12183-220K						
G12183-230K						
G12183-210KA-03			0.5			

*2: No dew condensation

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

*3: Chip temperature and package temperature

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.

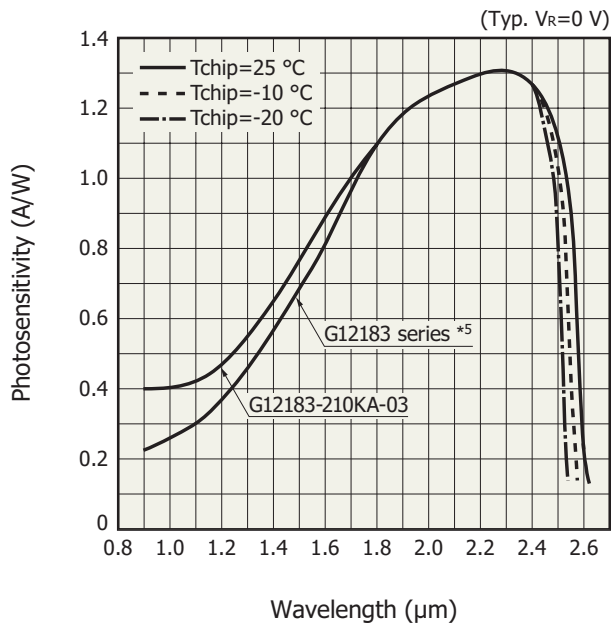
➤ Electrical and optical characteristics (Typ. unless otherwise noted)

Type no.	Measurement conditions Chip temperature T _{chip} (°C)	Thermistor resistance (+25 °C) R _{sh} (kΩ)	Thermistor B constant (-20/+25 °C) B (K)	Spectral response range λ (μm)	Peak sensitivity wavelength λ _p (μm)	Photosensitivity S λ=λ _p		Dark current I _D V _R =0.5 V		Temperature coefficient of dark current V _R =0.5 V (times/°C)
						Min. (A/W)	Typ. (A/W)	Typ. (μA)	Max. (μA)	
G12183-003K	25	-	-	0.9 to 2.6				0.4	4	1.035
G12183-005K								1	10	
G12183-010K								3	30	
G12183-020K								10	100	
G12183-030K								30	300	
G12183-103K	-10			0.9 to 2.57	2.3	1	1.3	0.12	1.2	
G12183-105K								0.3	3	
G12183-110K								0.9	9	
G12183-120K								3	30	
G12183-130K								9	90	
G12183-203K	-20	9.0	3300	0.9 to 2.55				0.085	0.85	
G12183-205K								0.21	2.1	
G12183-210K								0.65	6.5	
G12183-220K								2.1	21	
G12183-230K								6	60	
G12183-210KA-03								0.05* ⁴	0.1* ⁴	1.067* ⁴

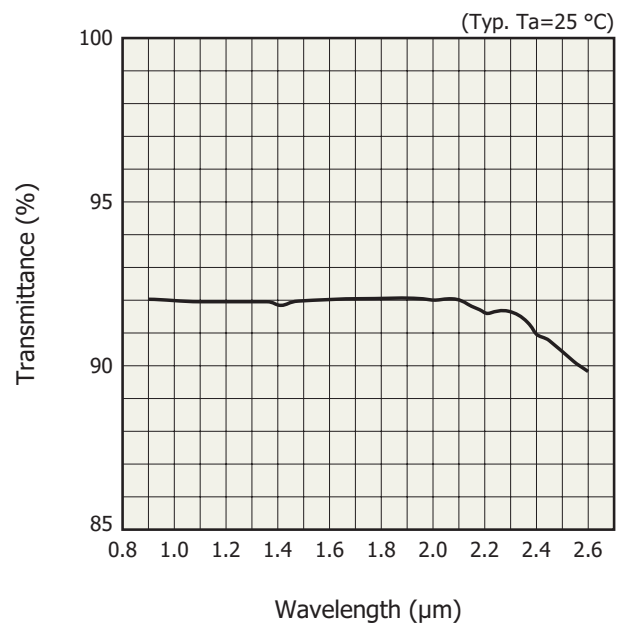
*4: V_R=10 mV

Type no.	Measurement conditions	Cutoff frequency fc		Terminal capacitance Ct		Shunt resistance Rsh		Detectivity D*		Noise equivalent power NEP	
	Chip temperature Tchip (°C)	VR=0 V RL=50 Ω		VR=0 V f=1 MHz		VR=10 mV		λ=λp		λ=λp	
		Min. (MHz)	Typ. (MHz)	Typ. (pF)	Max. (pF)	Min. (kΩ)	Typ. (kΩ)	Min. (cm·Hz ^{1/2} /W)	Typ. (cm·Hz ^{1/2} /W)	Typ. (W/Hz ^{1/2})	Max. (W/Hz ^{1/2})
G12183-003K	25	20	50	50	100	20	100	3 × 10 ¹⁰	9 × 10 ¹⁰	4 × 10 ⁻¹³	9 × 10 ⁻¹³
G12183-005K		5	20	140	300	10	50			5 × 10 ⁻¹³	1.5 × 10 ⁻¹²
G12183-010K		2	6	500	1000	2.8	14			1 × 10 ⁻¹²	3 × 10 ⁻¹²
G12183-020K		1	1.5	1800	3000	0.65	3			2 × 10 ⁻¹²	5 × 10 ⁻¹²
G12183-030K		0.5	0.8	4000	5000	0.25	1.4			3 × 10 ⁻¹²	8 × 10 ⁻¹²
G12183-103K	-10	20	70	44	100	200	1000	1 × 10 ¹¹	3 × 10 ¹¹	1 × 10 ⁻¹³	3 × 10 ⁻¹³
G12183-105K		5	25	120	300	100	500			1.5 × 10 ⁻¹³	4.5 × 10 ⁻¹³
G12183-110K		2	7	440	1000	28	140			2.5 × 10 ⁻¹³	8 × 10 ⁻¹³
G12183-120K		1	2	1500	3000	6.5	30			5.5 × 10 ⁻¹³	2 × 10 ⁻¹²
G12183-130K		0.5	0.9	3400	5000	2.8	14			8.5 × 10 ⁻¹³	2.5 × 10 ⁻¹²
G12183-203K	-20	20	75	40	100	400	2000	1.5 × 10 ¹¹	4.5 × 10 ¹¹	7 × 10 ⁻¹⁴	2 × 10 ⁻¹³
G12183-205K		5	28	110	300	200	1000			1 × 10 ⁻¹³	3 × 10 ⁻¹³
G12183-210K		2	8	400	1000	55	280			2 × 10 ⁻¹³	5.5 × 10 ⁻¹³
G12183-220K		1	2.3	1400	3000	13	60			4 × 10 ⁻¹³	1 × 10 ⁻¹²
G12183-230K		0.5	1	3200	5000	5.5	28			6 × 10 ⁻¹³	2 × 10 ⁻¹²
G12183-210KA-03		2	4	500	1000	100	200			2 × 10 ⁻¹¹	4 × 10 ⁻¹¹

Spectral response



Spectral transmittance of window material

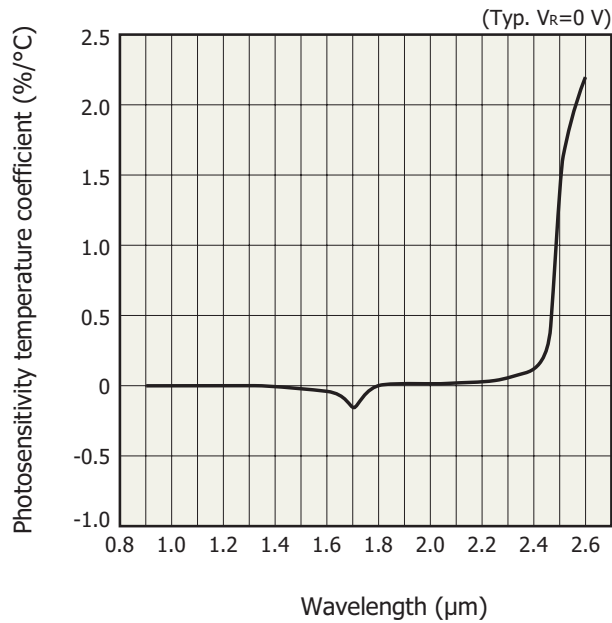


*5: Excluding G12183-210KA-03

KIRD0491EE

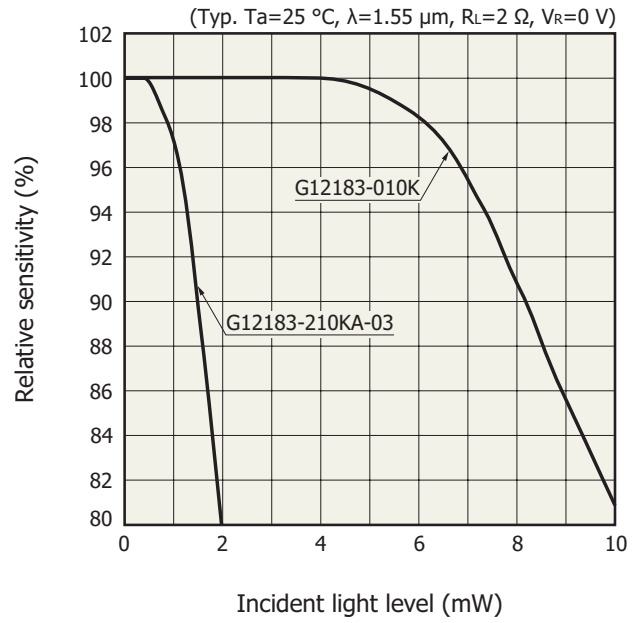
KIRD0639EB

Photosensitivity temperature characteristics



KIRD80642EA

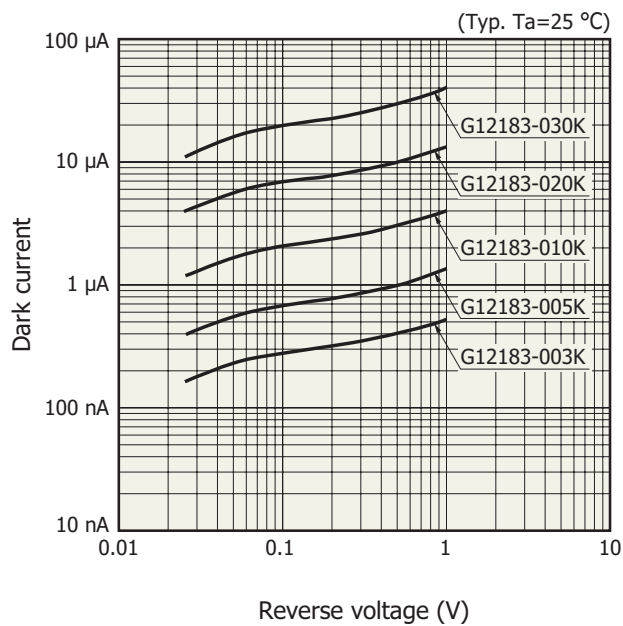
Linearity



KIRD80539EB

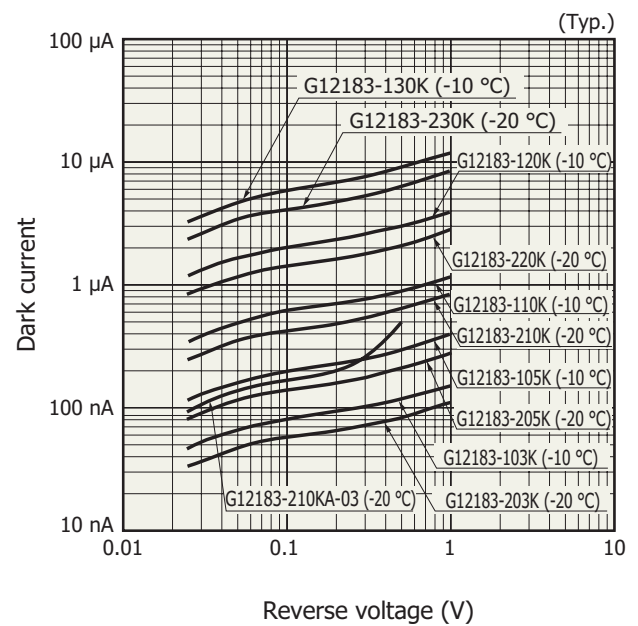
Dark current vs. reverse voltage

Non-cooled type



KIRD80492EB

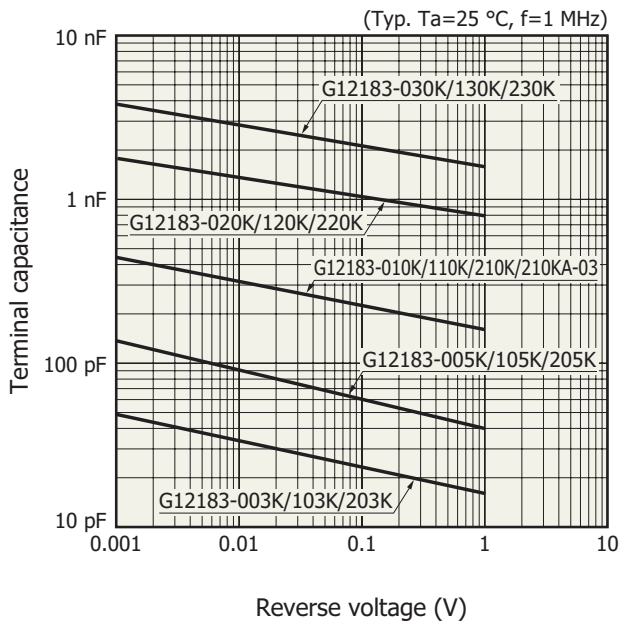
TE-cooled type



Note: Values in parentheses indicate chip temperature.

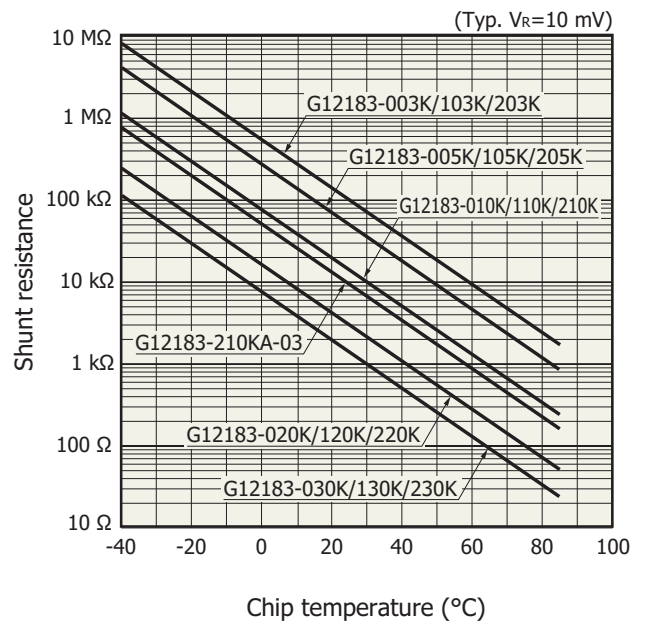
KIRD80531EC

Terminal capacitance vs. reverse voltage



KIRDB0493EC

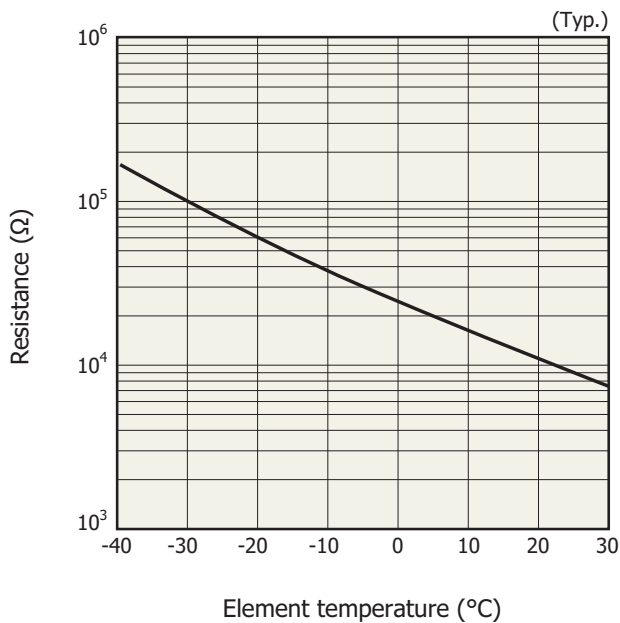
Shunt resistance vs. chip temperature



Note: The operating temperature for the one-stage TE-cooled type and two-stage TE-cooled type is up to 70 °C.

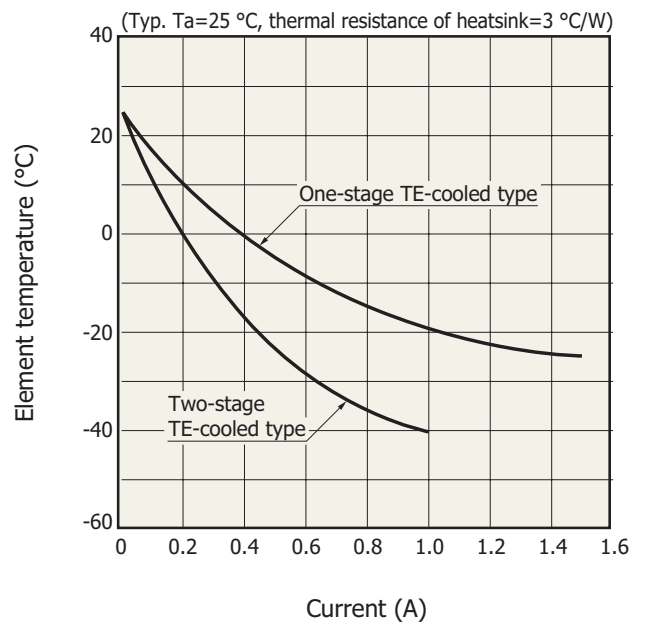
KIRDB0494ED

Thermistor temperature characteristics



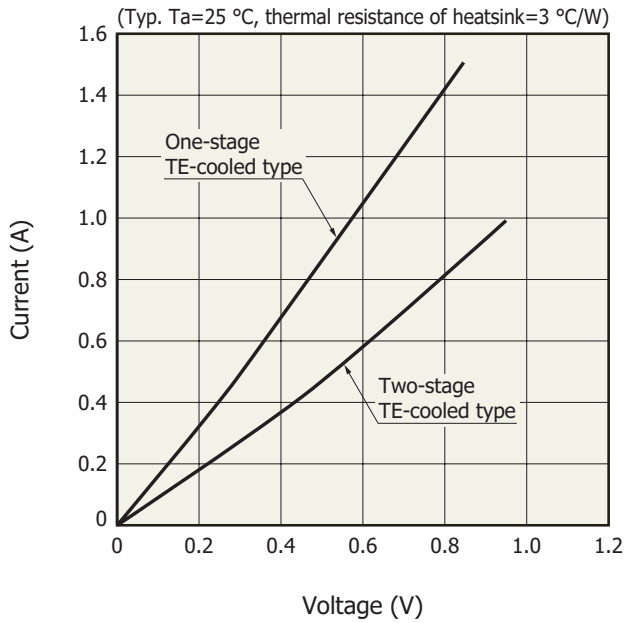
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Cooling characteristics of TE-cooler



KIRDB0231EA

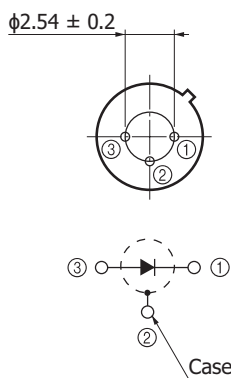
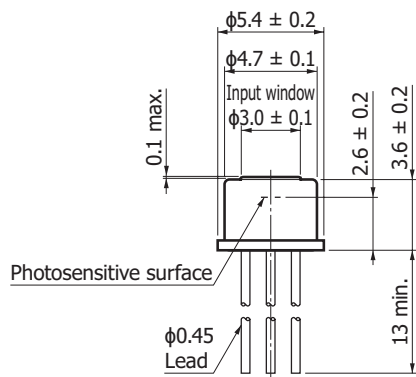
Current vs. voltage characteristics of TE-cooler



KIRD0115EB

Dimensional outlines (unit: mm)

(1) G12183-003K/005K/010K

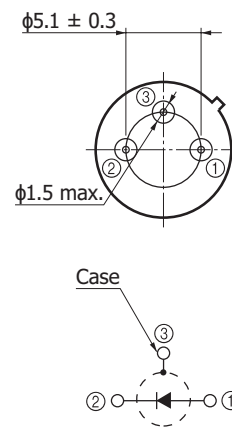
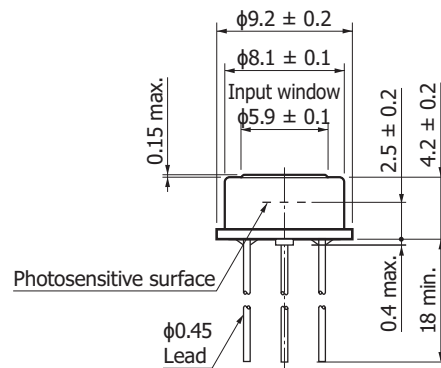


Distance from photosensitive area center to cap center

$$-0.2 \leq X \leq +0.2$$

$$-0.2 \leq Y \leq +0.2$$

(2) G12183-020K/030K



Distance from photosensitive area center to cap center

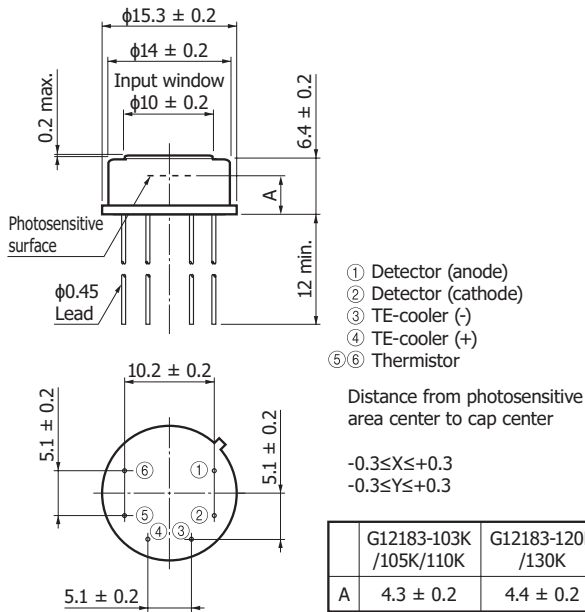
$$-0.2 \leq X \leq +0.2$$

$$-0.2 \leq Y \leq +0.2$$

KIRDA0220EA

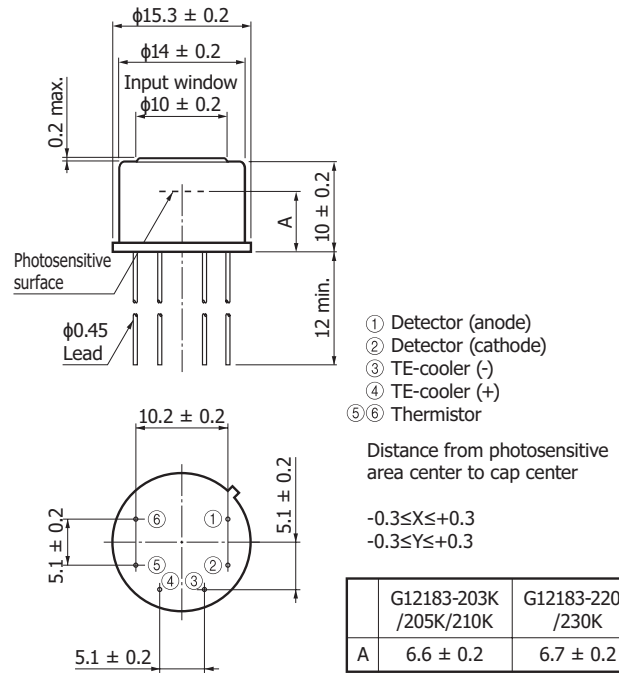
KIRDA0221EA

(3) G12183-103K/105K/110K/120K/130K



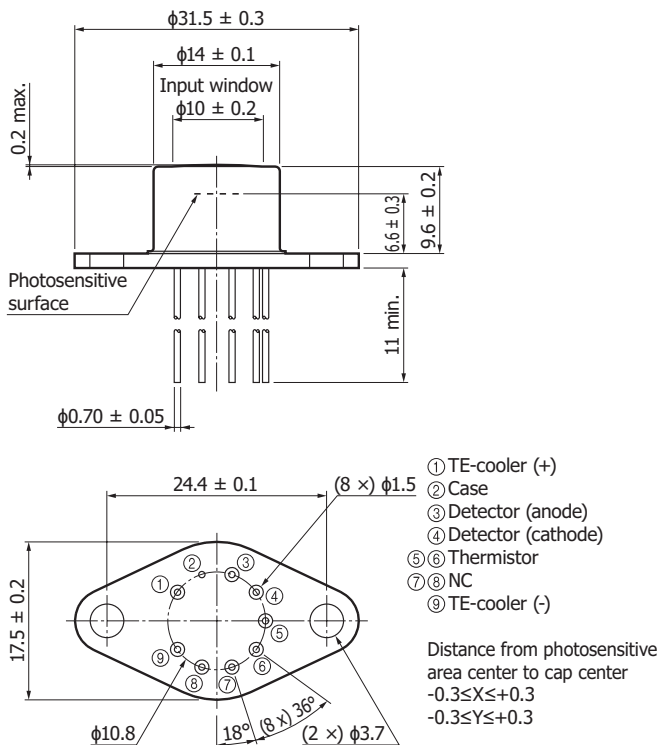
KIRDA0228EA

(4) G12183-203K/205K/210K/220K/230K



KIRDA0229EA

(5) G12183-210KA-03



KIRDA0265EB

Recommended soldering conditions

Solder temperature: 260 °C (10 s or less, once)

Solder the leads at a point at least 1 mm away from the package body.

Note: When you set soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.

Related information

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

■ Precautions

- Disclaimer
- Safety consideration
- Compound opto-semiconductors (photosensors, light emitters)

Information described in this material is current as of January 2021.

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