HAMAMATSU
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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 (excluding G12183-210KA-03)	**A3179-01**
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	TO-8	One-stage TE-cooled	ϕ0.3
G12183-105K				ϕ0.5
G12183-110K				ϕ1
G12183-120K				ϕ2
G12183-130K				ϕ3
G12183-203K	(4)/K	TO-8	Two-stage TE-cooled	ϕ0.3
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 ITE max (A)	Allowable TE-cooler voltage VTE max (V)	Reverse voltage VR max (V)	Operating temperature*2 Topr (°C)	Storage temperature*2 Tstg (°C)
G12183-003K	-	-	-	1	-40 to +85	-55 to +125
G12183-005K						
G12183-010K						
G12183-020K						
G12183-030K						
G12183-103K	0.2	1.5	1.0		-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.

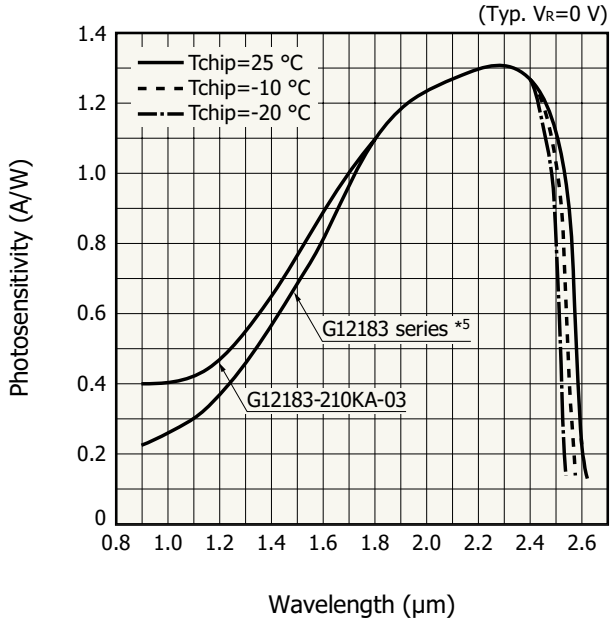
Electrical and optical characteristics (Typ. unless otherwise noted)

Type no.	Measurement conditions Chip temperature Tchip (°C)	Thermistor resistance (+25 °C) Rsh (kΩ)	Thermistor B constant (-20/+25 °C) B (K)	Spectral response range λ (μm)	Peak sensitivity wavelength λp (μm)	Photosensitivity S λ=λp Min. (A/W)	Photosensitivity S λ=λp Typ. (A/W)	Dark current ID VR=0.5 V Typ. (μA)	Dark current ID VR=0.5 V Max. (μA)	Temperature coefficient of dark current VR=0.5 V (times/°C)
G12183-003K	25	-	-	0.9 to 2.6	2.3	1	1.3	0.4	4	1.035
G12183-005K								1	10	
G12183-010K								3	30	
G12183-020K								10	100	
G12183-030K								30	300	
G12183-103K	-10	9.0	3300	0.9 to 2.57				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			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: VR=10 mV

Type no.	Measurement conditions Chip temperature Tchip (°C)	Cutoff frequency fc VR=0 V RL=50 Ω Min. (MHz)	Cutoff frequency fc VR=0 V RL=50 Ω Typ. (MHz)	Terminal capacitance Ct VR=0 V f=1 MHz Typ. (pF)	Terminal capacitance Ct VR=0 V f=1 MHz Max. (pF)	Shunt resistance Rsh VR=10 mV Min. (kΩ)	Shunt resistance Rsh VR=10 mV Typ. (kΩ)	Detectivity D* λ=λp Min. (cm·Hz$^{1/2}$/W)	Detectivity D* λ=λp Typ. (cm·Hz$^{1/2}$/W)	Noise equivalent power NEP λ=λp Typ. (W/Hz$^{1/2}$)	Noise equivalent power NEP λ=λp 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}	2 × 10^{-13}	4 × 10^{-13}

Spectral response



*5: Excluding G12183-210KA-03

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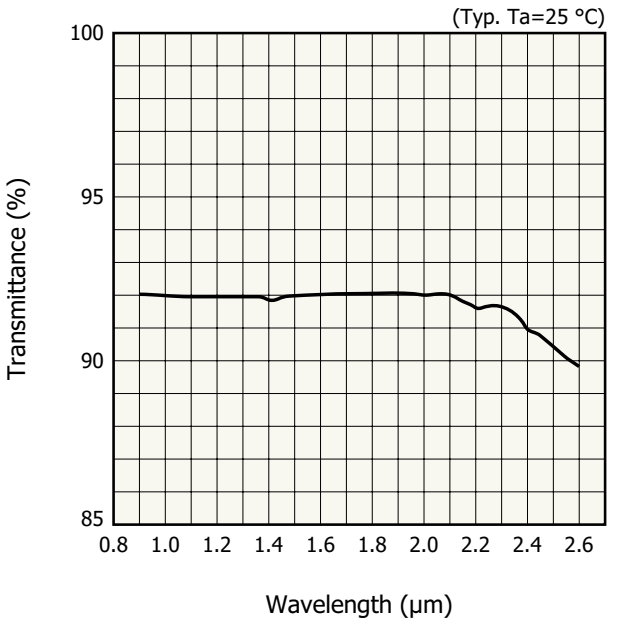
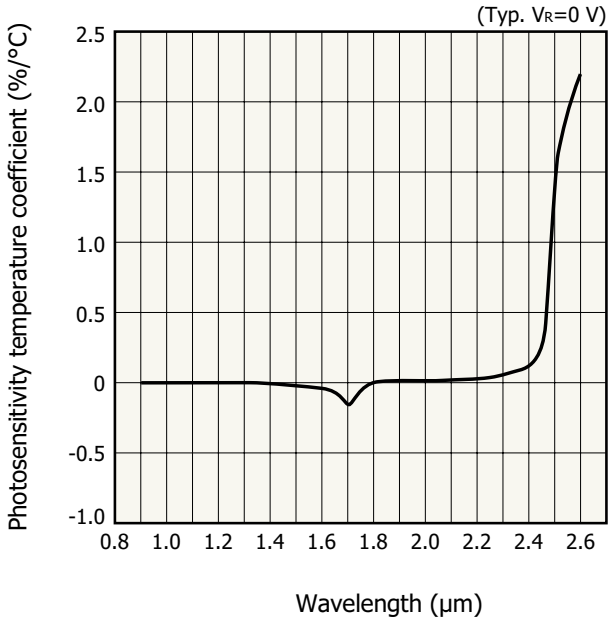
Spectral transmittance of window material



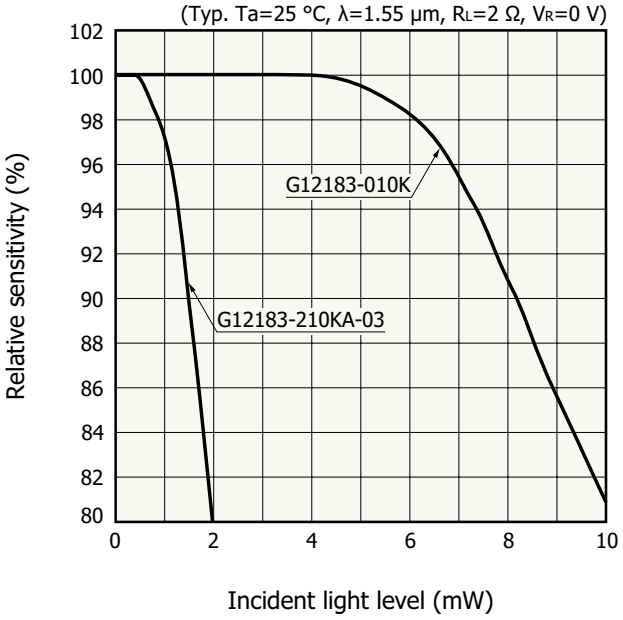
KIRDB0639EB

Photosensitivity temperature characteristics



KIRDB0642EA

Linearity



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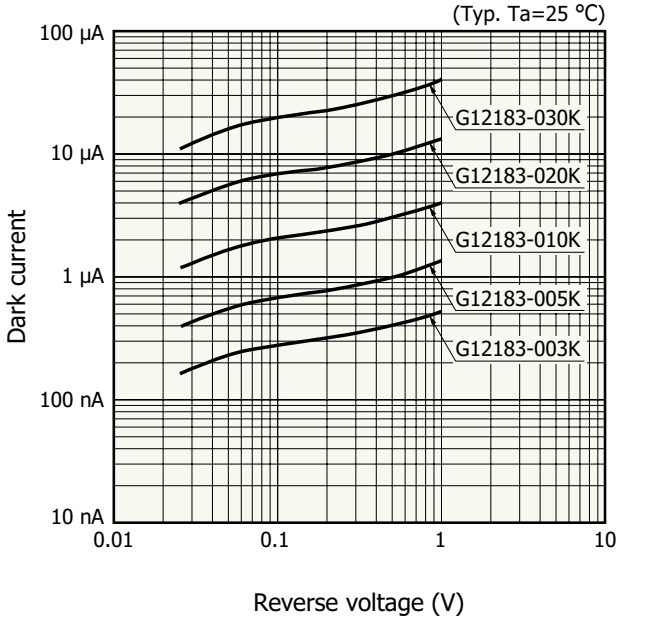
Dark current vs. reverse voltage

Non-cooled type



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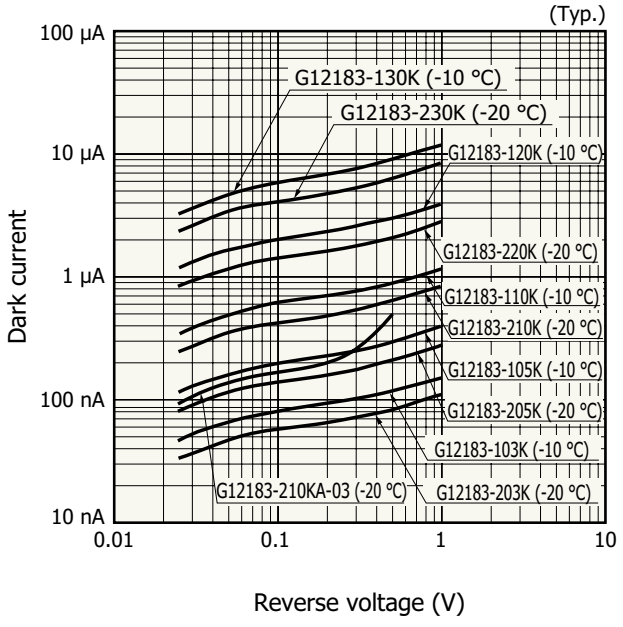
TE-cooled type



Note: Values in parentheses indicate chip temperature.

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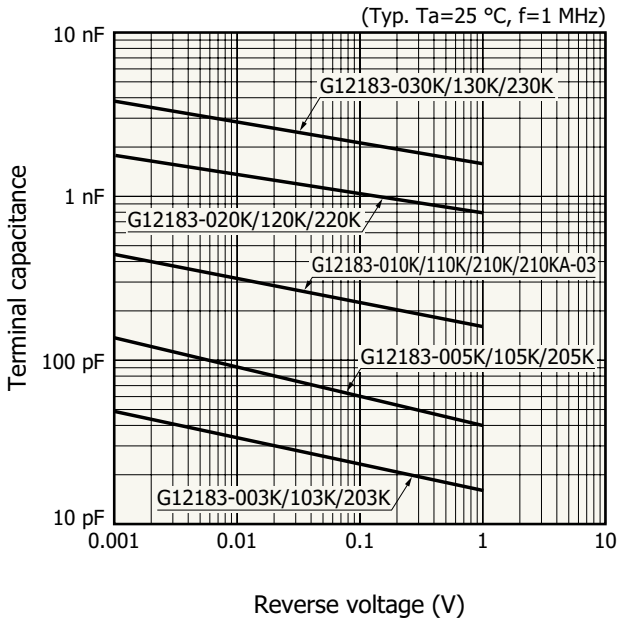
Terminal capacitance vs. reverse voltage



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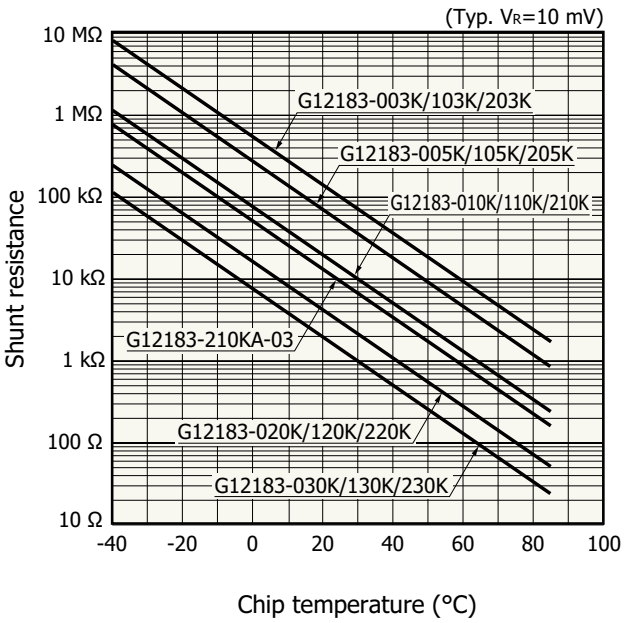
Shunt resistance vs. chip temperature



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

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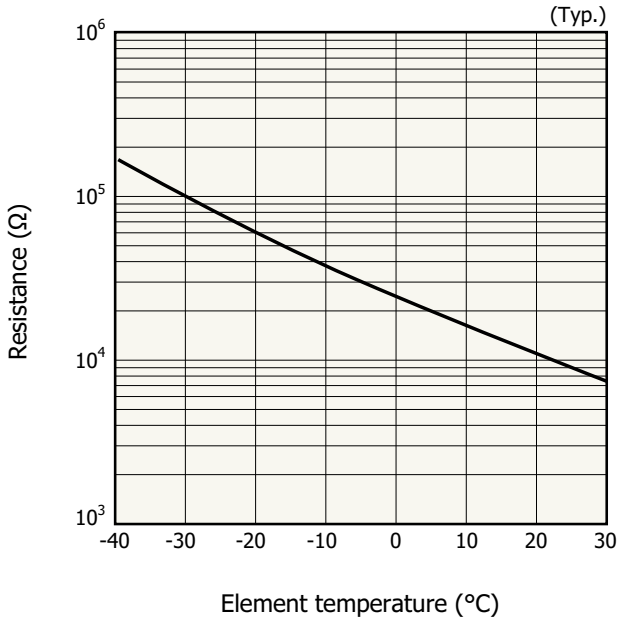
Thermistor temperature characteristics



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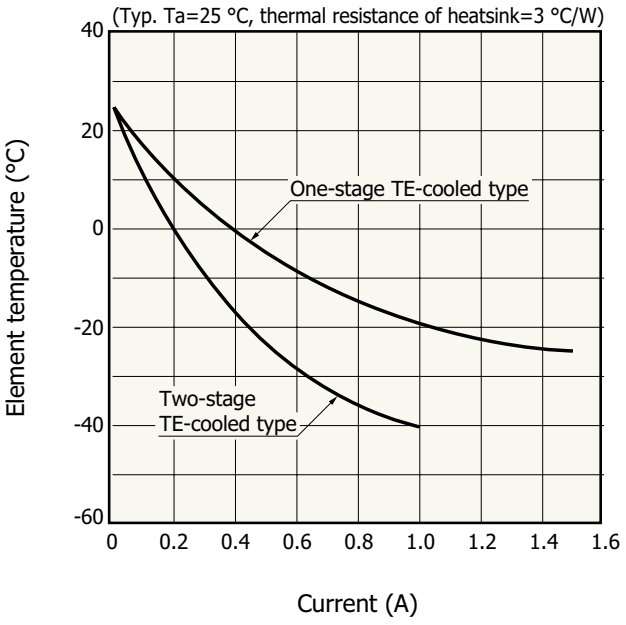
Cooling characteristics of TE-cooler



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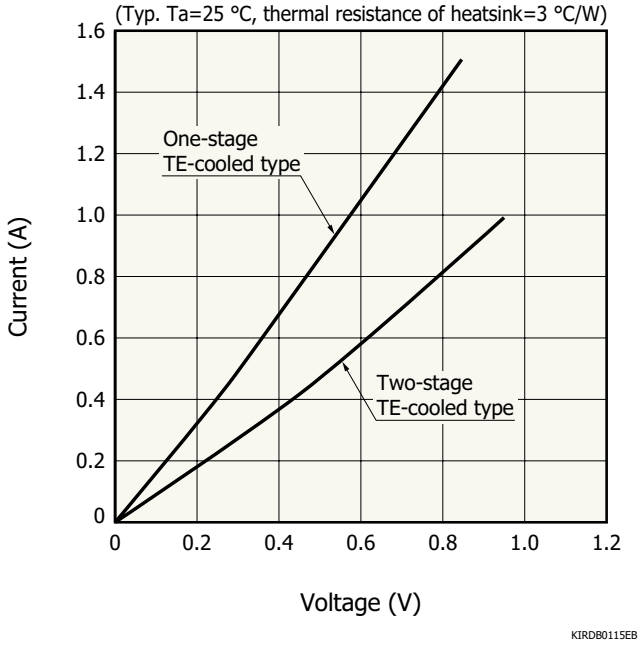
Current vs. voltage characteristics of TE-cooler



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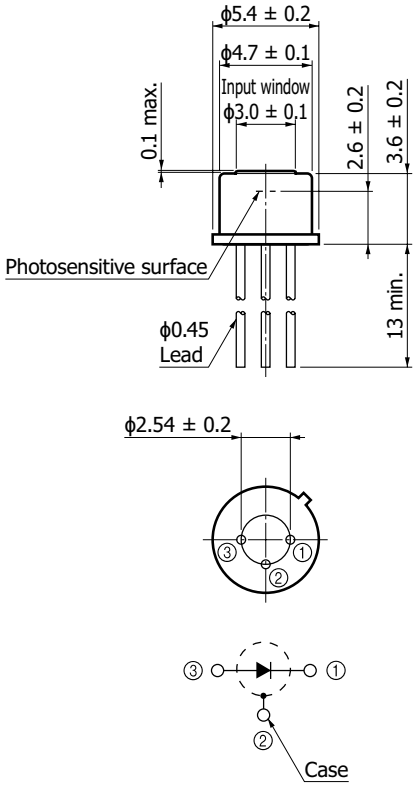
Dimensional outlines (unit: mm)

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



Distance from photosensitive area center to cap center

-0.2≤X≤+0.2
-0.2≤Y≤+0.2

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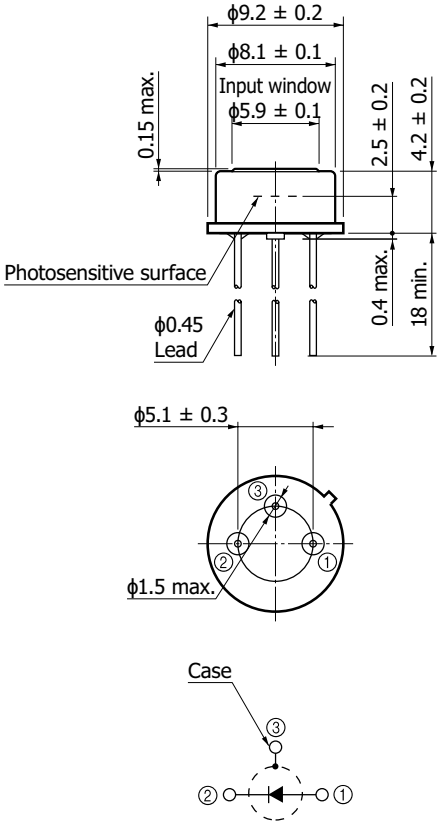
(2) G12183-020K/030K



Distance from photosensitive area center to cap center

-0.2≤X≤+0.2
-0.2≤Y≤+0.2

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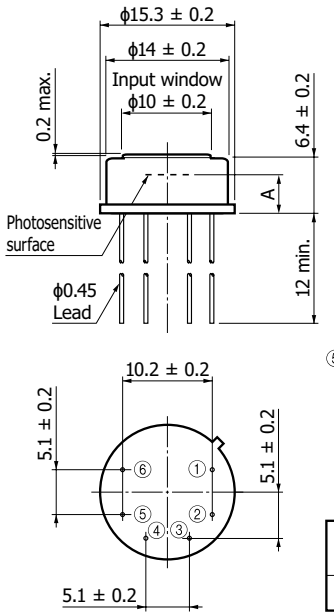
(3) G12183-103K/105K/110K/120K/130K



	G12183-103K /105K/110K	G12183-120K /130K
A	4.3 ± 0.2	4.4 ± 0.2

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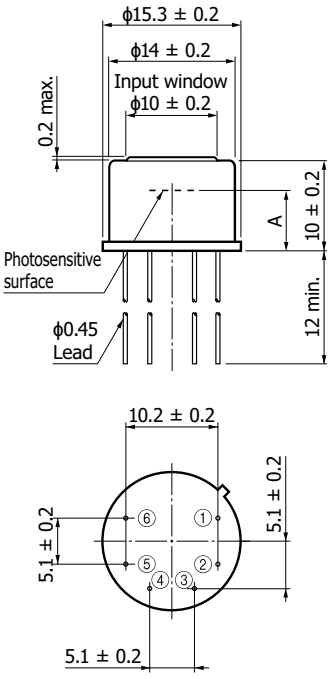
(4) G12183-203K/205K/210K/220K/230K



	G12183-203K /205K/210K	G12183-220K /230K
A	6.6 ± 0.2	6.7 ± 0.2

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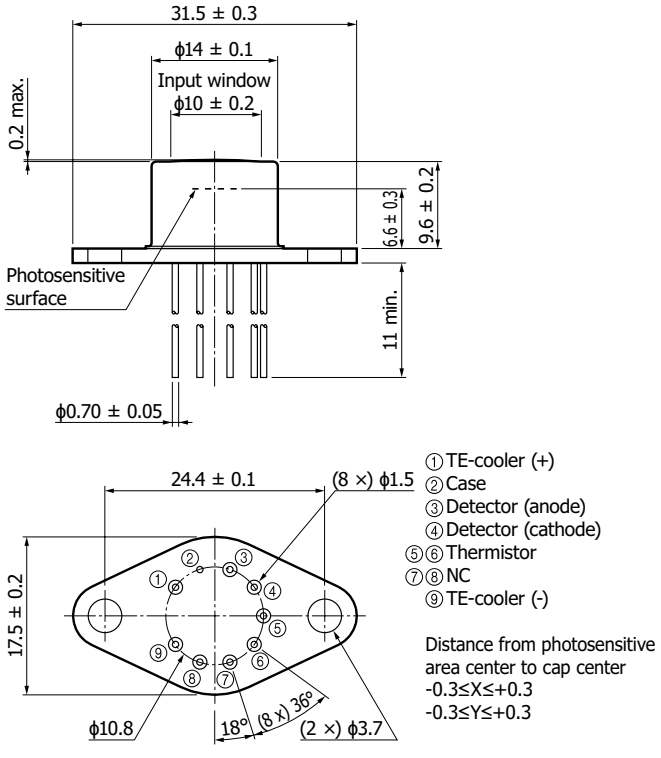
(5) G12183-210KA-03



KIRDA0265EC

Recommended soldering conditions

Solder temperature: 260 °C (10 s or less, once)
Solder the leads at a point at leat 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 / Opto-semiconductor products
· Precautions / Compound opto-semiconductors (photosensors, light emitters)

■ Catalogs
· Selection guide / Infrared detectors
· Technical note / Compound semiconductor photosensors

Information described in this material is current as of February 2025.
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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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