

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: $\phi 0.3$ to $\phi 3$ mm
- Low noise
- High sensitivity
- High reliability
- High-speed response
- High short-wavelength sensitivity
(G12183-210KA-03): 0.4 A/W ($\lambda=900$ 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				One-stage TE-cooled
G12183-105K	φ0.5			
G12183-110K	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

*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.

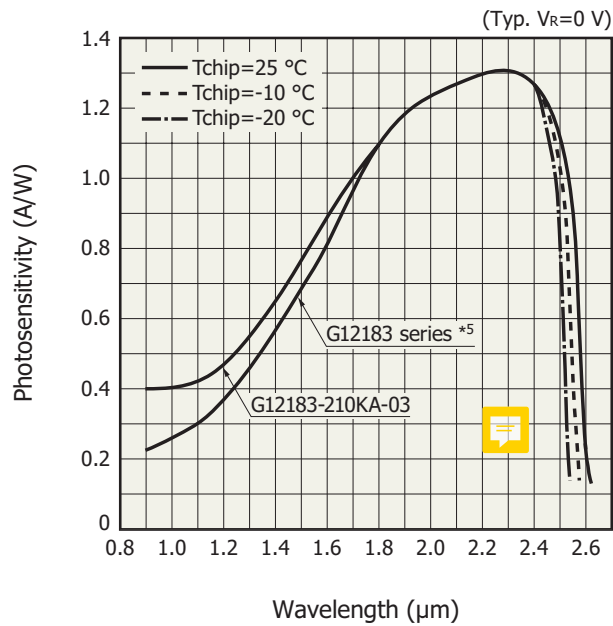
➤ Electrical and optical characteristics (Typ. unless otherwise noted)

Type no.	Measurement conditions	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		Dark current ID VR=0.5 V		Temperature coefficient of dark current VR=0.5 V (times/°C)
	Chip temperature Tchip (°C)					Min. (A/W)	Typ. (A/W)	Typ. (μA)	Max. (μA)	
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	0.12				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	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		$\lambda=\lambda_p$		$\lambda=\lambda_p$	
		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}	2×10^{-13}	4×10^{-13}

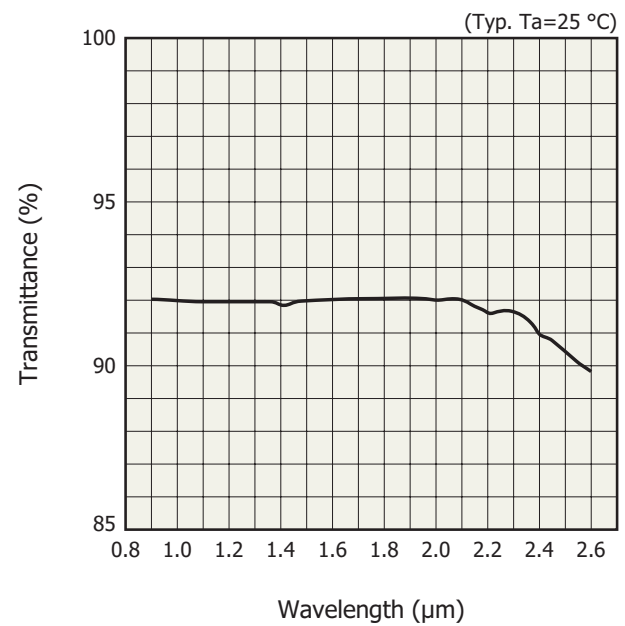
Spectral response



*5: Excluding G12183-210KA-03

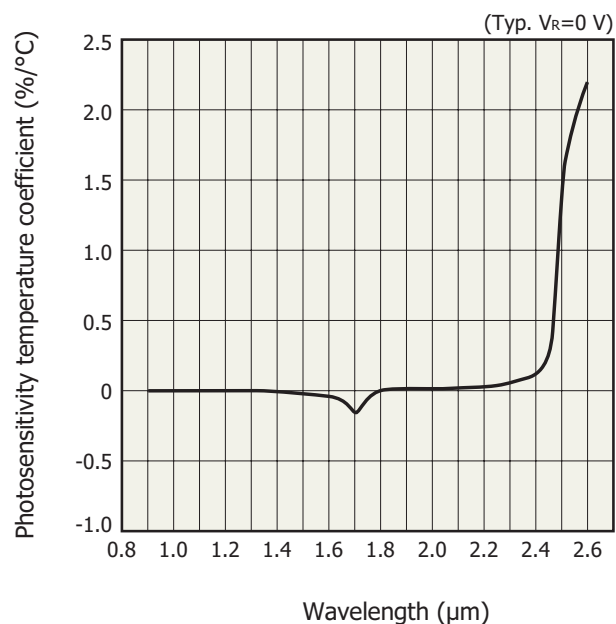
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Spectral transmittance of window material

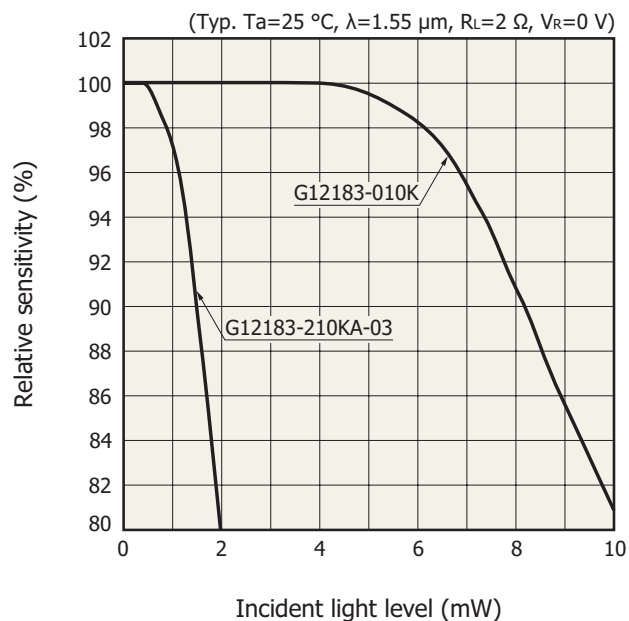


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Photosensitivity temperature characteristics

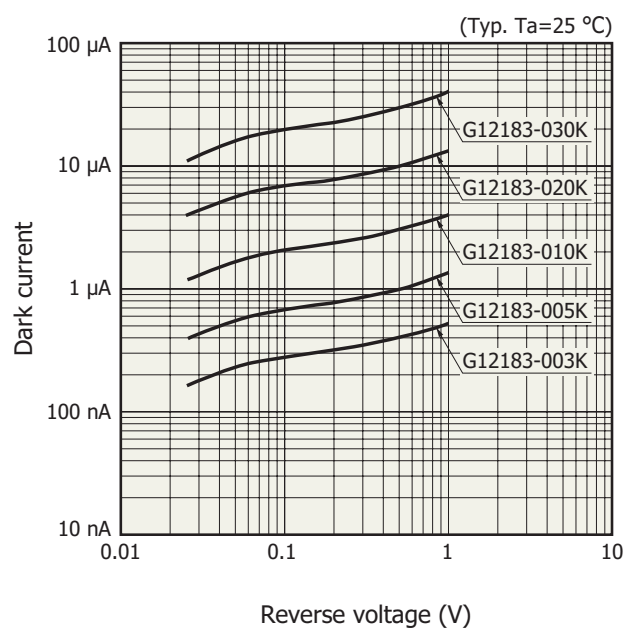


Linearity

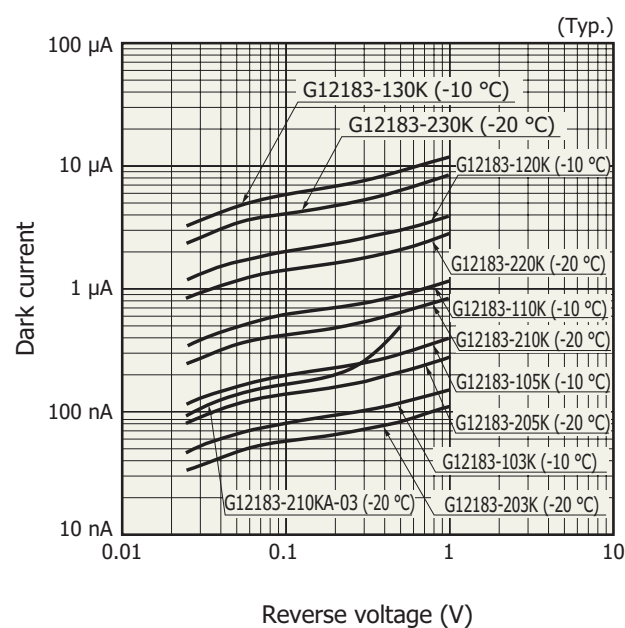


Dark current vs. reverse voltage

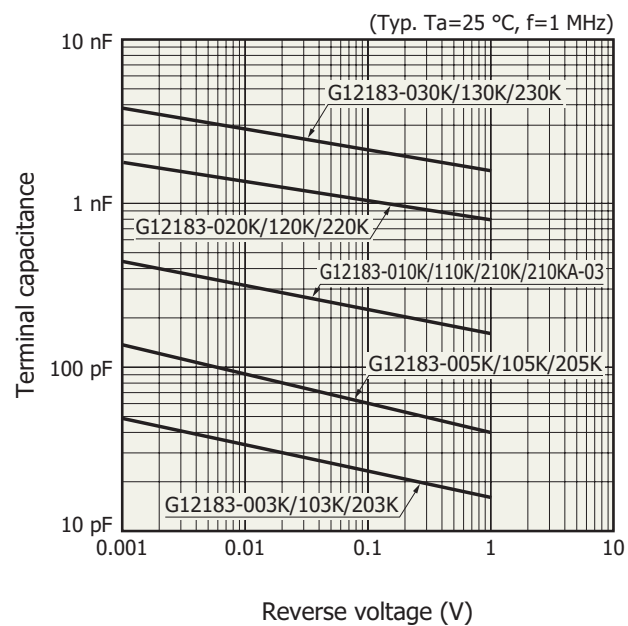
Non-cooled type



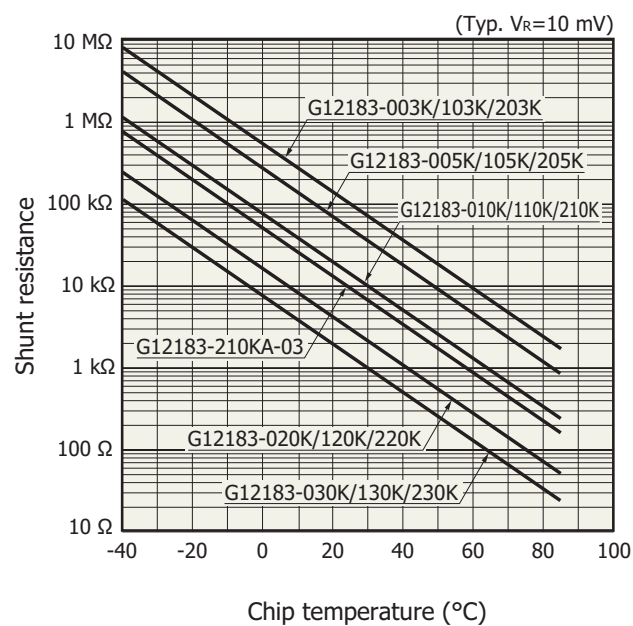
TE-cooled type



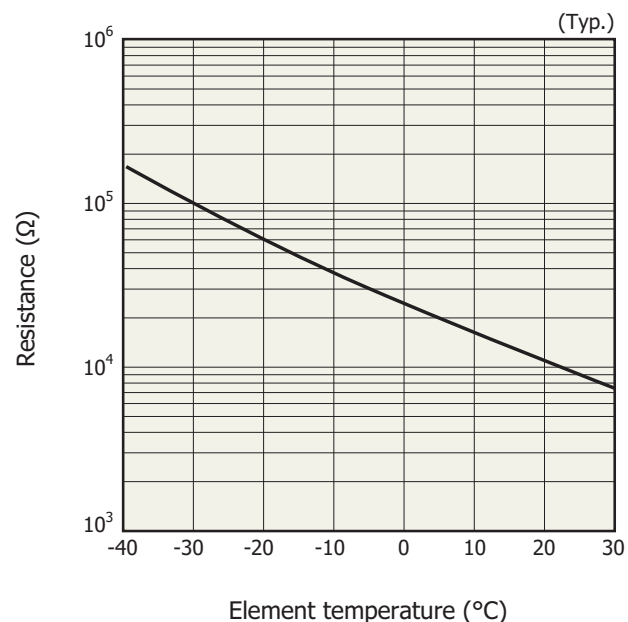
Terminal capacitance vs. reverse voltage



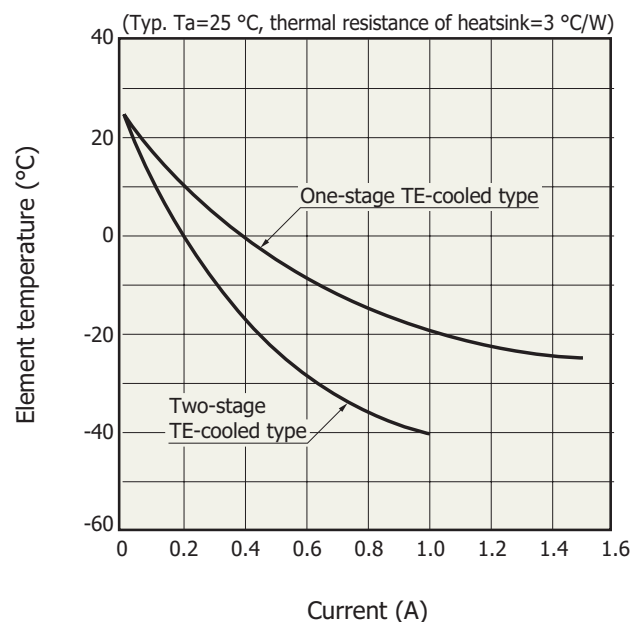
Shunt resistance vs. chip temperature



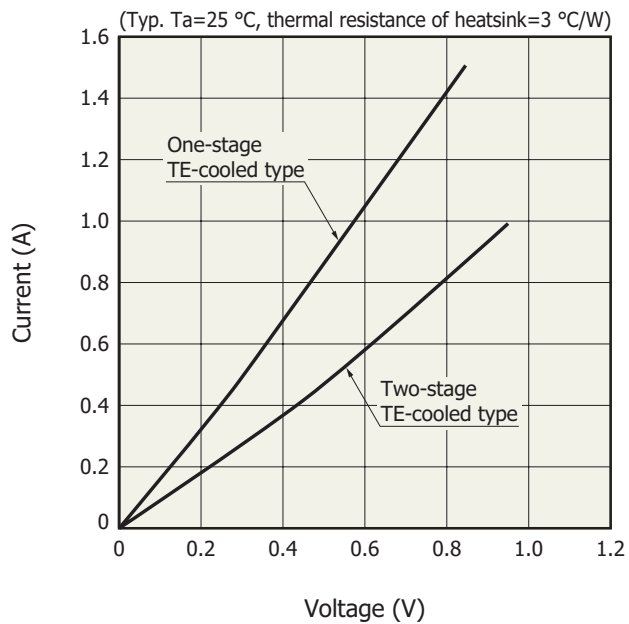
Thermistor temperature characteristics



Cooling characteristics of TE-cooler



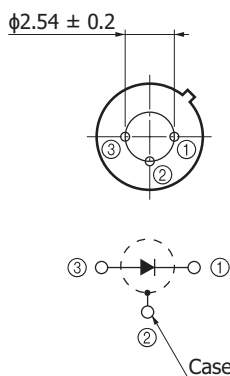
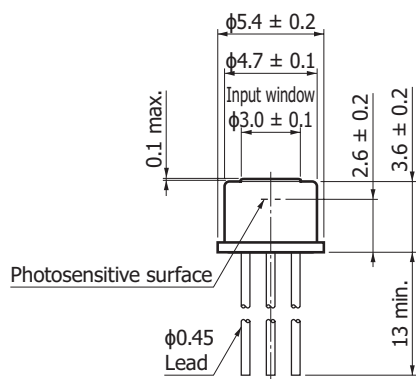
Current vs. voltage characteristics of TE-cooler



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Dimensional outlines (unit: mm)

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

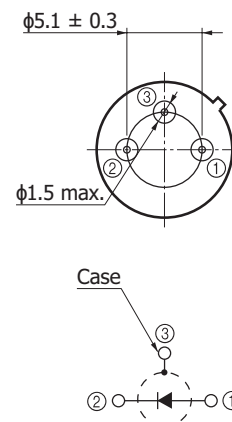
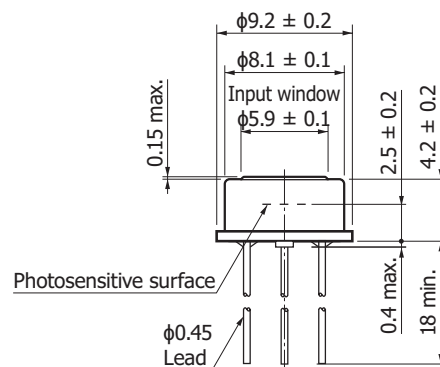


Distance from photosensitive area center to cap center

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

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(2) G12183-020K/030K

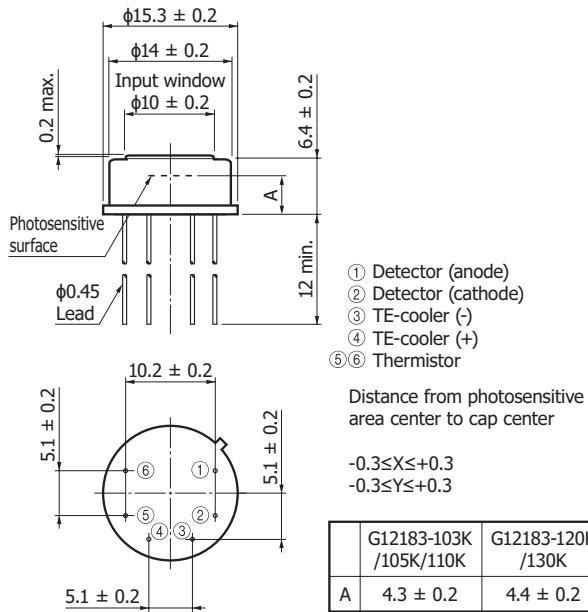


Distance from photosensitive area center to cap center

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

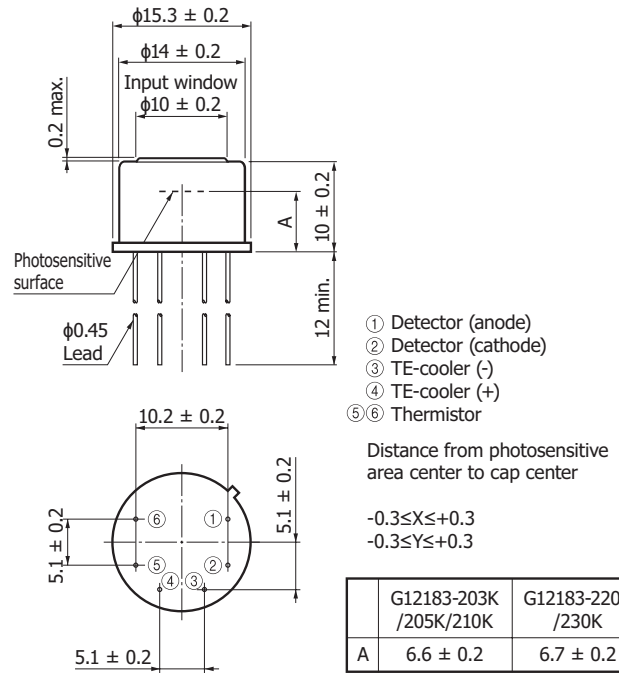
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(3) G12183-103K/105K/110K/120K/130K



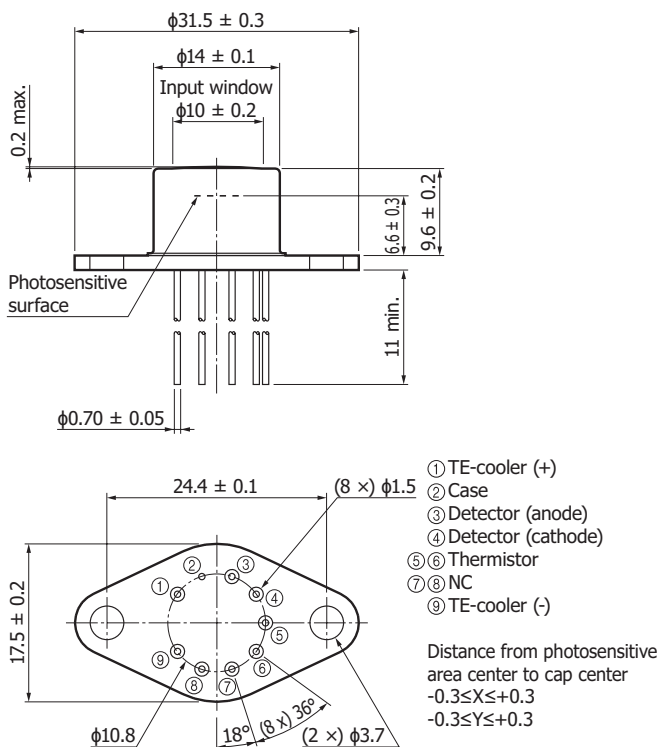
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(4) G12183-203K/205K/210K/220K/230K



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(5) G12183-210KA-03



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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.

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

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