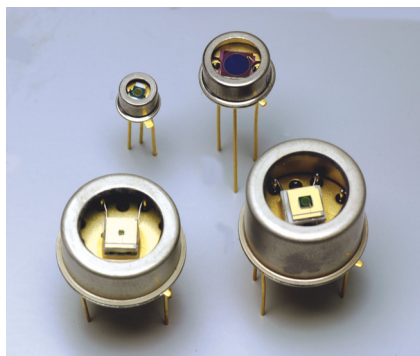


# InGaAs PIN photodiodes



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

### 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
G12183-003K	(1)/B	TO-18	Non-cooled	φ0.3	-	-	-	-	-40 to +85*2	-55 to +125*2	260 °C or less, within 10 s
G12183-005K				φ0.5							
G12183-010K				φ1							
G12183-020K	(2)/B	TO-5	Non-cooled	φ2	-	-	-	-	-40 to +85*2	-55 to +125*2	
G12183-030K				φ3							
G12183-103K				(3)/B							
G12183-105K	φ0.5										
G12183-110K	φ1										
G12183-120K	φ2										
G12183-130K	φ3										
G12183-203K	(4)/B	TO-8	Two-stage TE-cooled	φ0.3	0.2	1.0	1.2	1	-40 to +70*2	-55 to +85*2	
G12183-205K				φ0.5							
G12183-210K				φ1							
G12183-220K				φ2							
G12183-230K				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

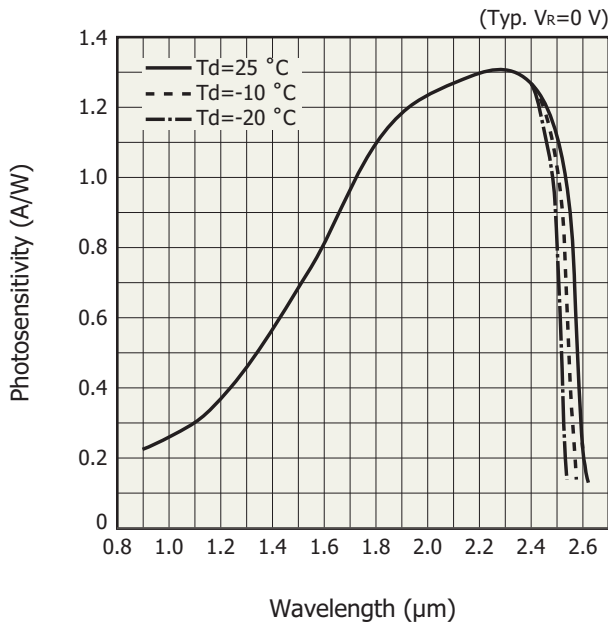
\*2: No condensation

The G12183 series may be destroyed or deteriorated by electrostatic discharge, etc. Be carefull when using the G12183 series.

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

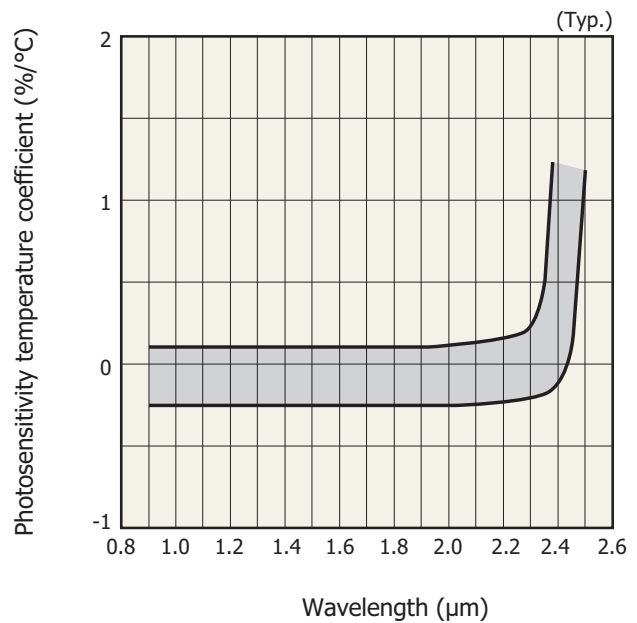
Type no.	Measurement Condition		Spectral response range $\lambda$ ( $\mu\text{m}$ )	Peak sensitivity wavelength $\lambda_p$ ( $\mu\text{m}$ )	Photo-sensitivity S $\lambda = \lambda_p$ (A/W)		Dark current I <sub>D</sub> V <sub>R</sub> =0.5 V ( $\mu\text{A}$ )		Temp. coefficient of I <sub>D</sub> V <sub>R</sub> =0.5 V	Cutoff frequency f <sub>c</sub> V <sub>R</sub> =0 V R <sub>L</sub> =50 $\Omega$ (MHz)		Terminal capacitance C <sub>t</sub> V <sub>R</sub> =0 V f=1 MHz (pF)		Shunt resistance R <sub>sh</sub> V <sub>R</sub> =10 mV (k $\Omega$ )		Detectivity D* $\lambda = \lambda_p$ (cm <sup>2</sup> Hz <sup>1/2</sup> /W)		Noise equivalent power NEP $\lambda = \lambda_p$ (W/Hz <sup>1/2</sup> )											
	Element temperature (°C)				Min. (A/W)	Typ. (A/W)	Typ. ( $\mu\text{A}$ )	Max. ( $\mu\text{A}$ )		Min. (MHz)	Typ. (MHz)	Typ. (pF)	Max. (pF)	Min. (k $\Omega$ )	Typ. (k $\Omega$ )	Min. (cm <sup>2</sup> Hz <sup>1/2</sup> /W)	Typ. (cm <sup>2</sup> Hz <sup>1/2</sup> /W)	Typ. (W/Hz <sup>1/2</sup> )	Max. (W/Hz <sup>1/2</sup> )										
G12183-003K	25	0.9 to 2.6			1	1.3	1.035			20	50	50	100	20	100	3 × 10 <sup>10</sup>	9 × 10 <sup>10</sup>			4 × 10 <sup>-13</sup>	9 × 10 <sup>-13</sup>								
G12183-005K																				1	10	5	20	140	300	10	50	5 × 10 <sup>-13</sup>	1.5 × 10 <sup>-12</sup>
G12183-010K																				3	30	2	6	500	1000	2.8	14	1 × 10 <sup>-12</sup>	3 × 10 <sup>-12</sup>
G12183-020K																				10	100	1	1.5	1800	3000	0.65	3	2 × 10 <sup>-12</sup>	5 × 10 <sup>-12</sup>
G12183-030K																				30	300	0.5	0.8	4000	5000	0.25	1.4	3 × 10 <sup>-12</sup>	8 × 10 <sup>-12</sup>
G12183-103K	-10	0.9 to 2.57	2.3		1	1.3	1.035			20	70	44	100	200	1000	1 × 10 <sup>11</sup>	3 × 10 <sup>11</sup>			1 × 10 <sup>-13</sup>	3 × 10 <sup>-13</sup>								
G12183-105K																				0.12	1.2	5	25	120	300	100	500	1.5 × 10 <sup>-13</sup>	4.5 × 10 <sup>-13</sup>
G12183-110K																				0.3	3	2	7	440	1000	28	140	2.5 × 10 <sup>-13</sup>	8 × 10 <sup>-13</sup>
G12183-120K																				0.9	9	1	2	1500	3000	6.5	30	5.5 × 10 <sup>-13</sup>	2 × 10 <sup>-12</sup>
G12183-130K																				3	30	0.5	0.9	3400	5000	2.8	14	8.5 × 10 <sup>-13</sup>	2.5 × 10 <sup>-12</sup>
G12183-203K	-20	0.9 to 2.55			1	1.3	1.035			20	75	40	100	400	2000	1.5 × 10 <sup>11</sup>	4.5 × 10 <sup>11</sup>			7 × 10 <sup>-14</sup>	2 × 10 <sup>-13</sup>								
G12183-205K																				0.085	0.85	5	28	110	300	200	1000	1 × 10 <sup>-13</sup>	3 × 10 <sup>-13</sup>
G12183-210K																				0.21	2.1	2	8	400	1000	55	280	2 × 10 <sup>-13</sup>	5.5 × 10 <sup>-13</sup>
G12183-220K																				0.65	6.5	1	2.3	1400	3000	13	60	4 × 10 <sup>-13</sup>	1 × 10 <sup>-12</sup>
G12183-230K																				2.1	21	0.5	1	3200	5000	5.5	28	6 × 10 <sup>-13</sup>	2 × 10 <sup>-12</sup>

Spectral response



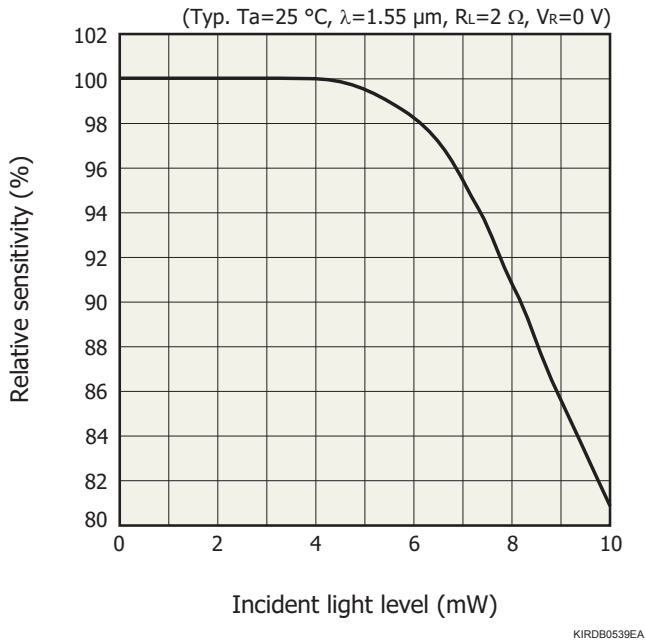
KIRD80491EC

Photosensitivity temperature characteristics



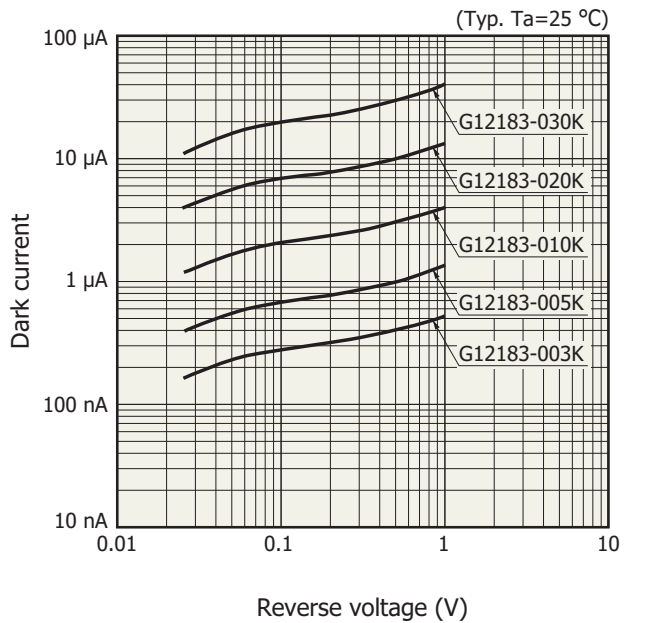
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▣ Linearity (G12183-010K)

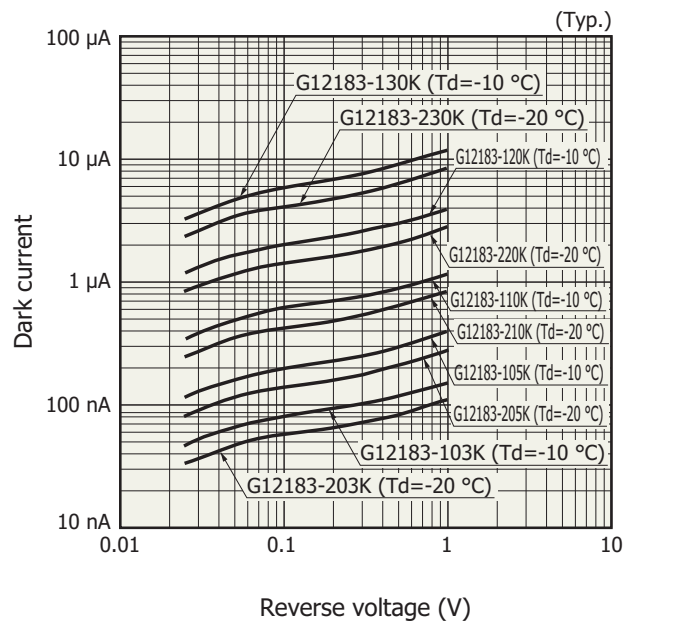


▣ Dark current vs. reverse voltage

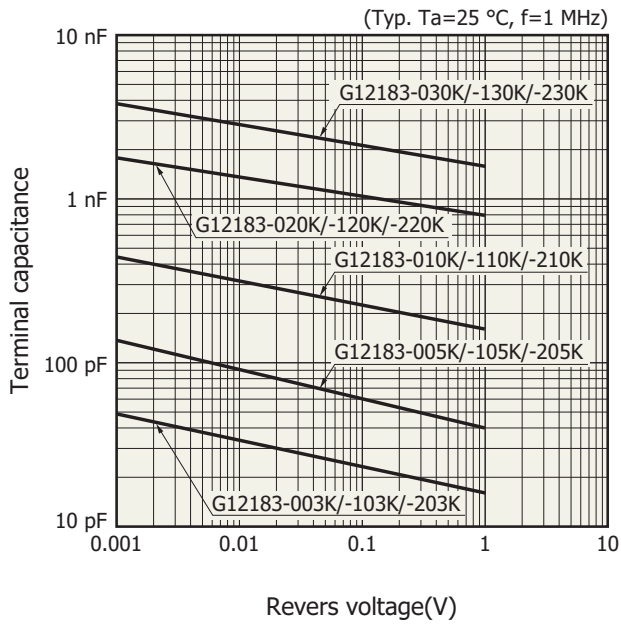
Non-cooled type



TE-cooled type

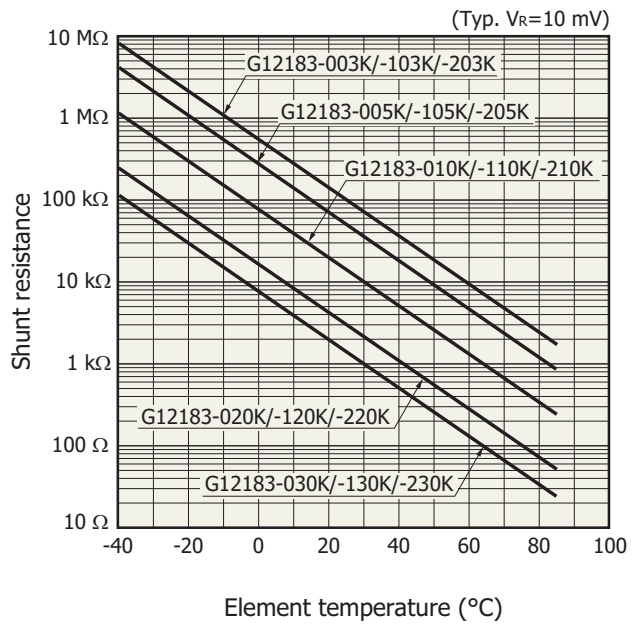


Terminal capacitance vs. reverse voltage



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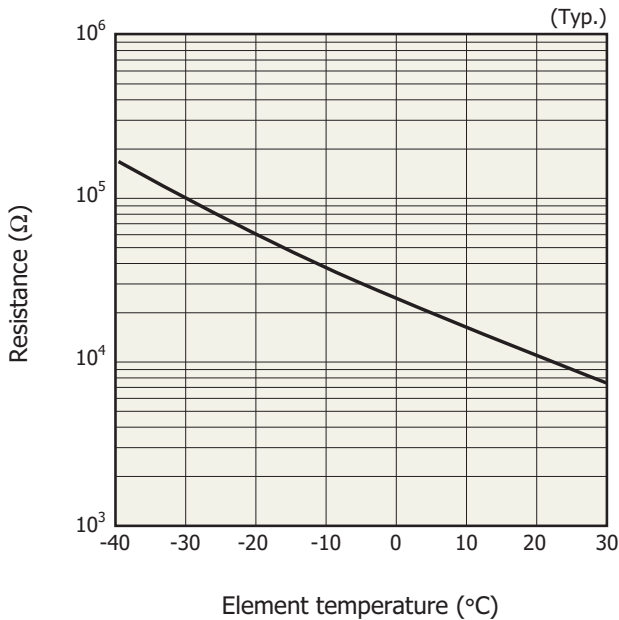
Shunt resistance vs. element temperature



KIRD80494EB

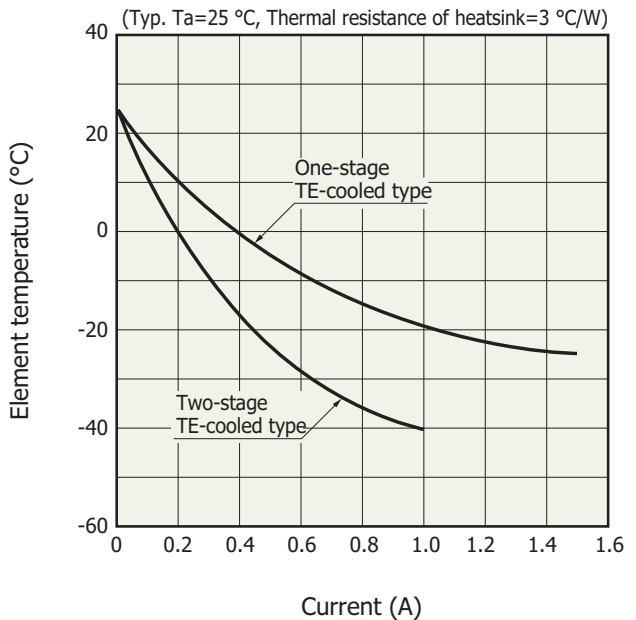
The operating temperature for one-stage and two-stage TE-cooled types is up to 70 °C.

Thermistor temperature characteristics



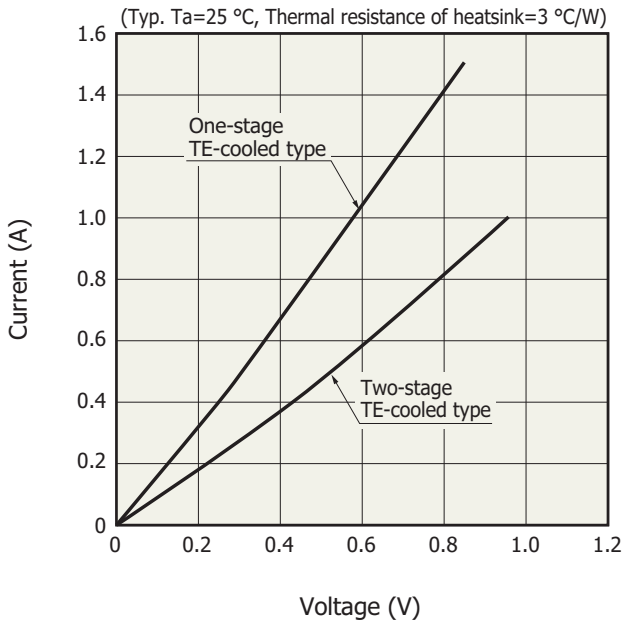
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Cooling characteristics of TE-cooler



KIRD80231EA

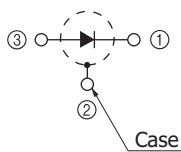
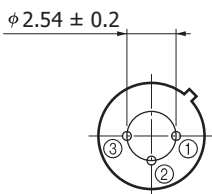
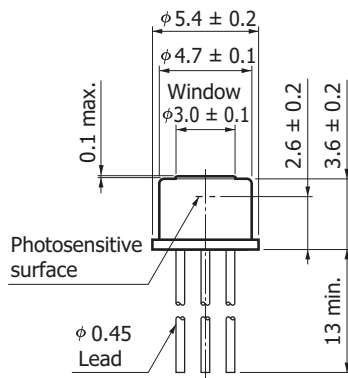
**Current vs. voltage (TE-cooler)**



KIRD80115EB

**Dimensional outlines (unit: mm)**

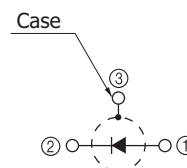
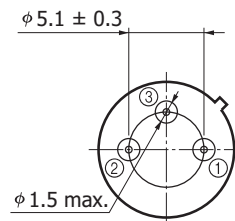
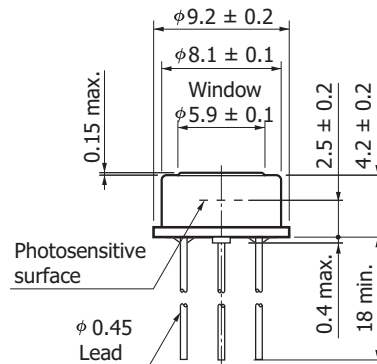
(1) G12183-003K/-005K/-010K



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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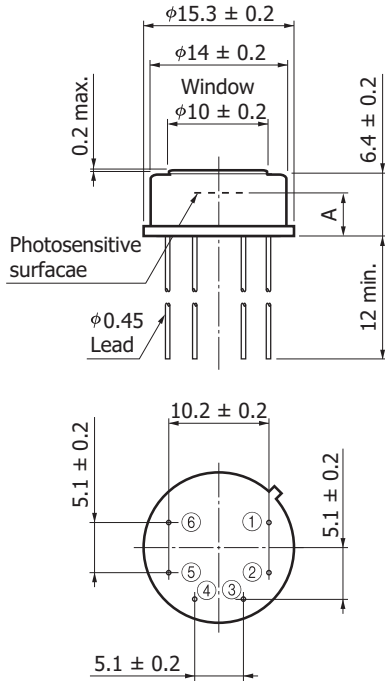
(2) G12183-020K/-030K



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



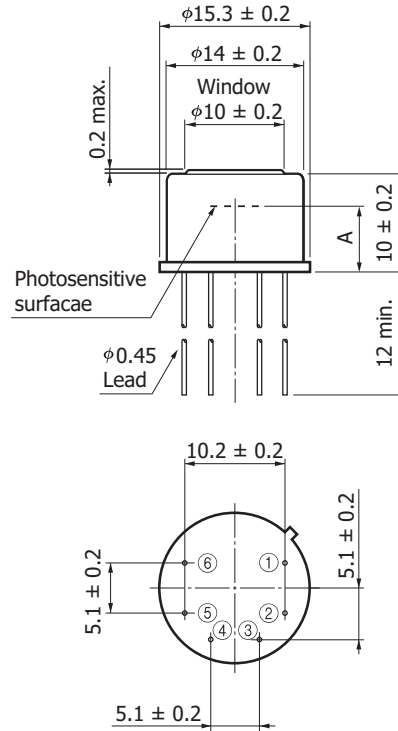
- ① Detector (anode)
- ② Detector (cathode)
- ③ TE-cooler (-)
- ④ Te-cooler (+)
- ⑤⑥ Thermistor

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

	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



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

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

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

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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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