

ILX Lightwave LTS-9300

Laser Diode Life-Test and Burn-In System, 64-Channel, Butterfly Package Type



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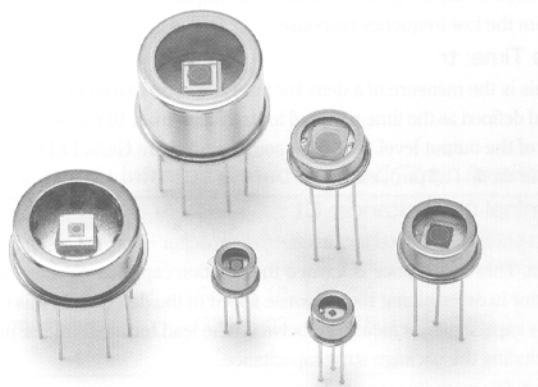
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InGaAs PIN Photodiodes (Standard Types)

Spectral Response Range: 0.7 to 1.7/0.9 to 1.7 μm

High-speed and low noise NIR (Near Infrared) detectors



ACCESSORIES (Optional)

Preamplicator for InGaAs PIN photodiodes (High-speed application)	: C4159-02
Preamplicator for InGaAs PIN photodiodes (Low-light-level detection)	: C4159-03
Heatsink for one-stage TE-cooled	: A3179
Heatsink for two-stage TE-cooled	: A3179-01
Temperature controller for TE-cooled Types	: C1103-04

SPECIFICATIONS (Common)

Peak Sensitivity Wavelength	1.55 μm
Window Material	Borosilicate glass
Operating Temperature	-40 to +85 °C (G7151-16: -25 to +70 °C)
Storage Temperature	-55 to +125 °C (G7151-16: -25 to +70 °C)

InGaAs PIN photodiodes have small terminal capacitance and therefore achieve high-speed response. In addition, these devices feature low noise operation due to high shunt resistance.

A wide range of device types are available:

Large area types, short-wavelength enhanced types, etc.

Standard Types

A wide range of device types are available, ranging in active area from 0.08 mm diameter to 5 mm diameter.

Short-Wavelength (0.7 to 0.9 μm) Enhanced Types

These InGaAs PIN photodiodes have enhanced responsivity in the 0.7 to 0.9 μm region. With a single detector, it is possible to cover a wide spectral range from the short wavelength band to the long wavelength band for use in such fields as optical communications and optical measurement systems.

TE-Cooled Types

Thermoelectrically-cooled devices can greatly reduce the dark current, achieving an improved D^* value. Thus these devices are ideally suited for low-level-light detection in the NIR (near infrared) region. The thermoelectric cooler is available in a one-stage (-10 °C) or two-stage (-20 °C) configuration.

SPECIFICATIONS (TE-cooled Types)

Operating Temperature	-40 to +70 °C
Storage Temperature	-55 to +85 °C
Thermistor Allowable Dissipation	0.2 mW
Peltier Element	1.5 A (one-stage types)
Allowable Current	1.0 A (two-stage types)

(Unless otherwise noted, Typ. $T_a = 25^\circ\text{C}$)

Type No.	Outline No. (P. 34,35)	Package	Active Area (mm)	Photo Sensitivity S			Dark Current I_D $V_R = 5\text{ V}$		Shunt Resistance R_{sh} $V_R = 10\text{ mV}$	D^* $\lambda = \lambda_p$	NEP $\lambda = \lambda_p$	Cut-off Frequency f_c $V_R = 5\text{ V}$ $R_L = 50\ \Omega$	Terminal Capacitance C_t $f = 1\text{ MHz}$	Maximum Reverse Voltage $V_R\text{ Max.}$
				0.78 μm (A/W)	1.3 μm (A/W)	1.55 μm (λ_p) (A/W)	Typ.	Max.						

Standard Types (0.9 to 1.7 μm)

G3476-01	①	TO-18	$\phi 0.08$	-	0.9	0.95	0.08	0.4	8000	5×10^{12}	2×10^{-15}	2 (GHz)	1	20
G3476-03			$\phi 0.3$	-	0.9	0.95	0.3	1.5	1000	5×10^{12}	4×10^{-15}	400	5	20
G3476-05			$\phi 0.5$	-	0.9	0.95	0.5	2.5	300	5×10^{12}	8×10^{-15}	200	12	20
G5832-01			$\phi 1.0$	-	0.9	0.95	1	5	100	5×10^{12}	2×10^{-14}	35	90	10
G5832-02	②	TO-5	$\phi 2.0$	-	0.9	0.95	5 *1	25 *1	25	5×10^{12}	4×10^{-14}	4 *1	550 *1	5
G5832-03			$\phi 3.0$	-	0.9	0.95	15 *1	75 *1	10	5×10^{12}	6×10^{-14}	2 *1	1000 *1	5
G5832-05	③	TO-8	$\phi 5.0$	-	0.9	0.95	25 *1	125 *1	3	5×10^{12}	1×10^{-13}	0.6 *1	3500 *1	2

16-element Array

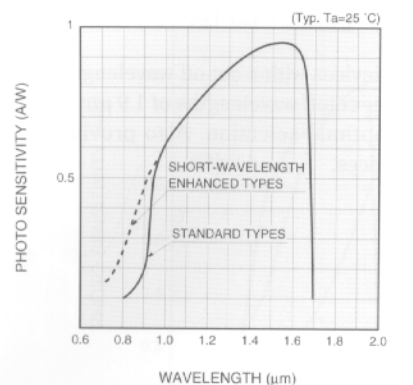
G7151-16	⑫	DIP	0.08×0.2 (16 elements)	-	0.9	0.95	0.2 *1	1 *1	3000	5×10^{12}	3×10^{-15}	500 *1	6 *1	5
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Short-wavelength (0.7 to 0.9 μm) Enhanced Types

G5125-03	①	TO-18	$\phi 0.3$	0.25	0.9	0.95	0.3	1.5	1000	5×10^{12}	4×10^{-15}	400	5	6
G5125-10			$\phi 1.0$	0.25	0.9	0.95	1	5	100	5×10^{12}	2×10^{-14}	40	30	6

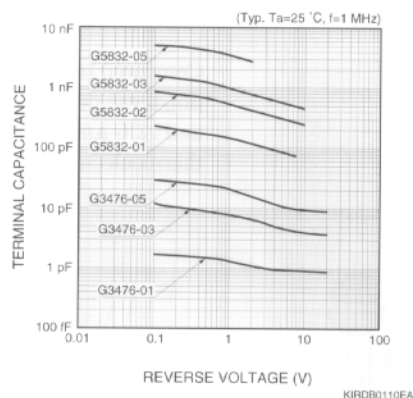
*1: $V_R = 1\text{ V}$

Spectral Response



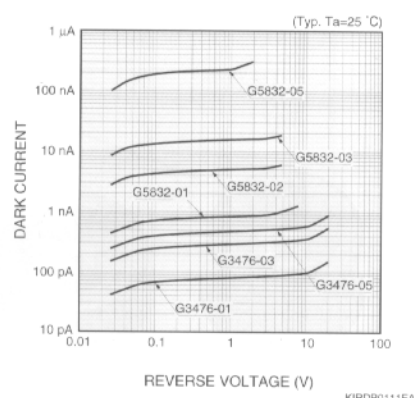
The cut-off wavelengths of the TE-cooled devices shift to shorter wavelengths as compared to the room temperature operating devices.
one-stage TE : 1.67 μm
two-stage TE : 1.65 μm

Terminal Capacitance vs. Reverse Voltage



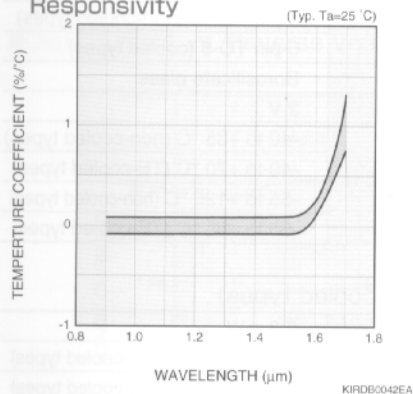
For high-speed applications, the lead length should be as short as possible to minimize the terminal capacitance.

Dark Current vs. Reverse Voltage

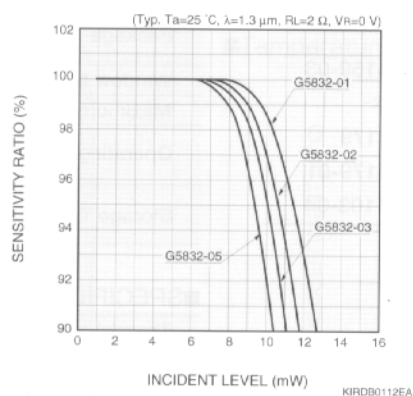


The dark current increases with the application of reverse voltage, but the frequency response and linearity are improved.

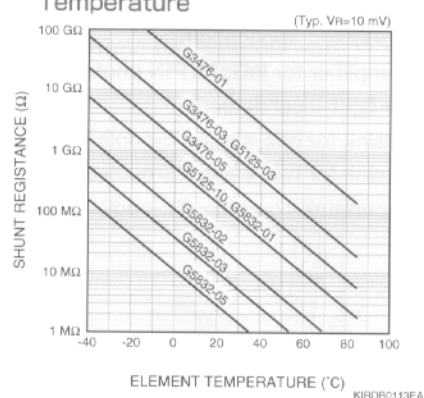
Temperature Characteristic for Responsivity



Linearity



Shunt Resistance vs. Temperature



Type No.	Outline No. (P. 34)	Package	Active Area (mm)	Measurement Temperature (°C)	Photo Sensitivity S		Dark Current ID VR=1 V		Shunt Resistance Rsh VR=10 mV (MΩ)	D* $\lambda=\lambda_p$ (cm • Hz ^{1/2} /W)	NEP $\lambda=\lambda_p$ (W/Hz ^{1/2})	Cut-off Frequency fc VR=1 V RL=50 Ω (MHz)	Terminal Capacitance Ct VR=1 V f=1 MHz (pF)	Maximum Reverse Voltage VR Max. (V)
					1.3 μm (A/W)	1.55 μm (λ_p) (A/W)	Typ.	Max.						

One-stage TE-cooled Types (0.9 to 1.67 μm)

G5832-11	4	TO-8	$\phi 1.0$	-10	0.9	0.95	0.07	0.35	1500	2×10^{13}	5×10^{-15}	18	150	5
G5832-12			$\phi 2.0$				0.3	1.5	300		1×10^{-14}	4	550	
G5832-13			$\phi 3.0$				1	5	100		2×10^{-14}	2	1000	
G5832-15			$\phi 5.0$				2.5	12.5	30		3×10^{-14}	0.6	3500	

Two-stage TE-cooled Types (0.9 to 1.65 μm)

G5832-21	5	TO-8	$\phi 1.0$	-20	0.9	0.95	0.03	0.15	3000	3×10^{13}	3×10^{-15}	18	150	5
G5832-22			$\phi 2.0$				0.15	0.75	600		7×10^{-15}	4	550	
G5832-23			$\phi 3.0$				0.5	2.5	200		1×10^{-14}	2	1000	
G5832-25			$\phi 5.0$				1.2	6	60		2×10^{-14}	0.6	3500	

Precautions for Use

Refer to "Precautions for Handling InGaAs PIN Photodiodes" on page 50.

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