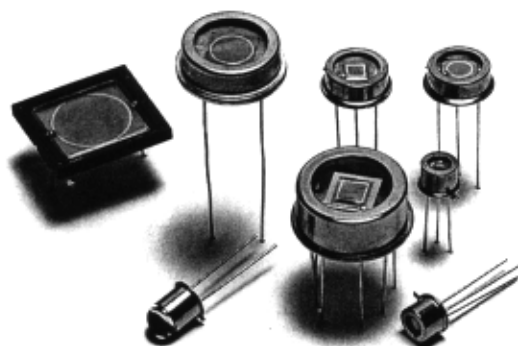


Ge Photodiodes (Non-cooled Types)

Spectral Response Range: 0.8 to 1.8 μm

NIR (Near Infrared) detectors for stable operation at room temperature



■ High stability over extended time periods

Ge photodiodes are planar type photovoltaic devices that provide stable responsivity over extended time periods.

■ Lower temperature detection limit: 200 °C approx.

■ ACCESSORIES (Optional)

Preamplifier for Ge photodiodes C4159

■ SPECIFICATIONS (Common)

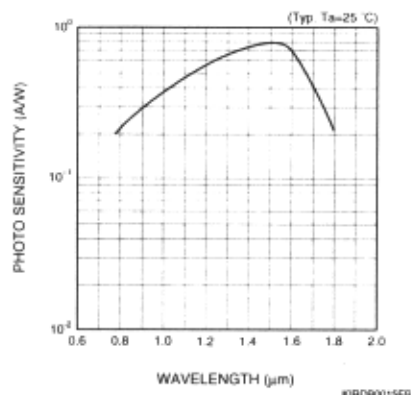
Peak Wavelength	1.55 μm
Window Material	Borosilicate glass *
Operating Temperature	-40 to +70 °C
Storage Temperature	-55 to +85 °C

* Non-reflective coating on the window surface is available on request.
Please consult our sales office.

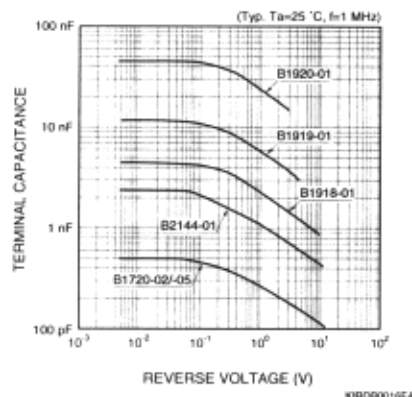
(Unless otherwise noted, Typ. $T_a=25$ °C)

Type No.	Outline No. (P. 34, 35)	Package	Active Area (mm)	Photo Sensitivity S $\lambda=\lambda_p$ (A/W)	Short Circuit Current I_{sc} 100 μA , 2856 K		Dark Current I_D $V_R=10$ mV		Shunt Resistance R_{sh} $V_R=10$ mV (k Ω)	D^* $\lambda=\lambda_p$ ($\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$)	NEP $\lambda=\lambda_p$ 10 to 90 % (W/Hz ^{1/2})	Rise Time t_r $V_R=0$ V $R_L=1$ k Ω (μs)	Terminal Capacitance C_t $V_R=0$ V $f=1$ MHz (nF)	Maximum Reverse Voltage V_R Max. (V)
					Min. (μA)	Typ. (μA)	Typ. (μA)	Max. (μA)						
B1720-02	7	TO-18	$\phi 1$	0.8	1	1.4	0.3	0.6	33	1×10^{11}	8×10^{-13}	3	0.4	10
B1720-05	8		$\phi 1$ (Lens type)	0.8	9	12	0.3	0.6	33	1×10^{11}	8×10^{-13}	3	0.4	10
B2144-01	9	TO-5	$\phi 2$	0.8	4	6	1.2	2.4	8	1×10^{11}	1×10^{-12}	5	2	10
B1918-01			$\phi 3$	0.8	10	13	2	4	5	1×10^{11}	2×10^{-12}	7	4.5	10
B1919-01	10	TO-8	$\phi 5$	0.8	24	30	4	8	2.5	1×10^{11}	2×10^{-12}	11	10	5
B1920-01	11	Ceramic	$\phi 10$	0.8	90	120	20	40	0.5	1×10^{11}	4×10^{-12}	35	50	3

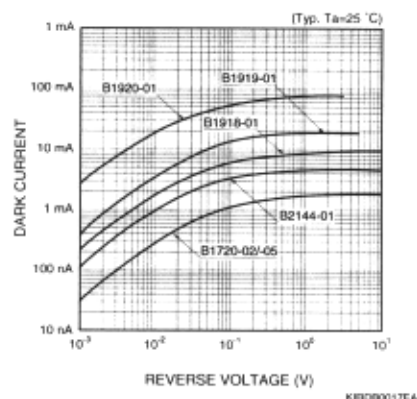
■ Spectral Response



■ Terminal Capacitance vs. Reverse Voltage

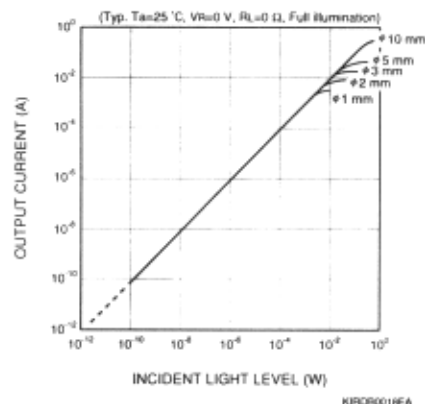


■ Dark Current vs. Reverse Voltage



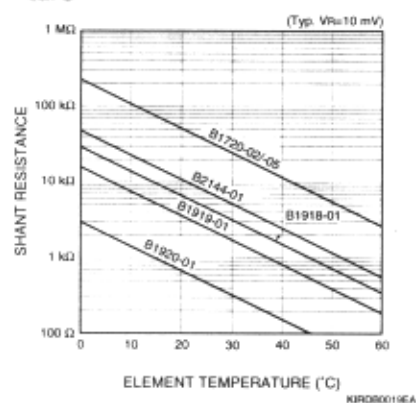
The dark current increases with the application of a reverse voltage, but the response speed and linearity are improved.

■ Linearity

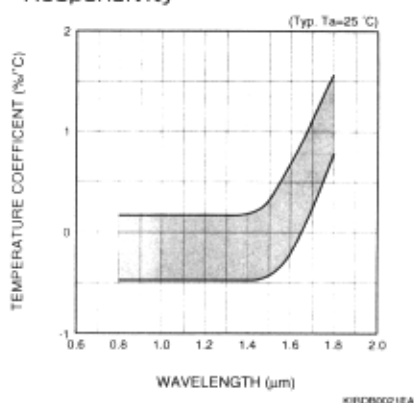


Increasing the load resistance provides higher output voltage, but the linearity limit becomes lower.

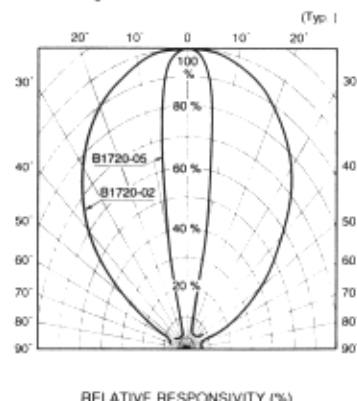
■ Shunt Resistance vs. Temperature



■ Temperature Characteristic for Responsivity



■ Directivity



Ge Photodiodes (Cooled Types)

Spectral Response Range: 0.8 to 1.8 μm

Achieving higher S/N by cooling



The characteristics of dark current and S/N can be improved effectively by cooling Ge photodiodes.

When cooled, it should be noted that the spectral response of Ge photodiodes shifts slightly to the short wavelength region.

■ Optimized for precision infrared photometry

■ Lower temperature detection limit: 200 °C approx.

One or Two-stage TE-cooled Types

Utilizing Peltier effect, these devices thermoelectrically cool the detector elements for reducing the dark current. Two-stage type cools the detector element down to -20 °C, while -10 °C cooling is realized by one-stage type. Dedicated heatsinks and temperature controllers are available both for one and two-stage types.

Metal Dewar Types

Dewar types hold liquid nitrogen for cooling the device down to -196 °C (77 K), allowing measurements with an excellent S/N. The large dewar capacity enables 8-hour continuous cooling.

Metal dewar types can be re-evacuated if necessary.

ACCESSORIES (Optional)

Heatsink for one-stage TE-cooled types	A3179
Heatsink for two-stage TE-cooled types	A3179-01
Temperature controller for TE-cooled types	C1103-04
Preamplifier for Ge photodiodes	C4159

SPECIFICATIONS (Common)

Package	TO-8 (one or two-stage TE-cooled types)
Window Material	Borosilicate glass (one or two-stage TE-cooled types) Sapphire glass (metal dewar types)
Thermistor Allowable Dissipation	0.2 mW
Peltier Element Allowable Current	1.5 A (one-stage types) 1.0 A (two-stage types)
Operating Temperature	-40 to +70 °C
Storage Temperature	-55 to +85 °C

(Unless otherwise noted, Typ.)

Type No.	Outline No. (P. 34, 35)	Active Area (mm)	Measurement Temperature (°C)	Peak Sensitivity Wavelength λ_p (μm)	Photo Sensitivity S $\lambda = \lambda_p$ (A/W)	Short Circuit Current I _{sc} 100 lx, 2856 K		Dark Current I _o V _R =10 mV		Shunt Resistance R _{sh} V _R =10 mV (k Ω)	D* $\lambda = \lambda_p$ (cm · Hz ^{1/2} /W)	NEP $\lambda = \lambda_p$ (W/Hz ^{1/2})	Rise Time t _r V _R =0 V R _L =1 k Ω 10 to 90 %	Terminal Capacitance C _t V _R =0 V f=1 MHz	Maximum Reverse Voltage V _R Max.
						Min.	Typ.	Typ.	Max.						
						(μA)	(μA)	(nA)	(nA)				(μs)	(nF)	(V)

One-stage Thermoelectrically-cooled Types

B2538-05	①	φ5	-10	1.52	0.8	24	30	90	500	110	5×10^{11}	5×10^{-13}	11	10	5
----------	---	----	-----	------	-----	----	----	----	-----	-----	--------------------	---------------------	----	----	---

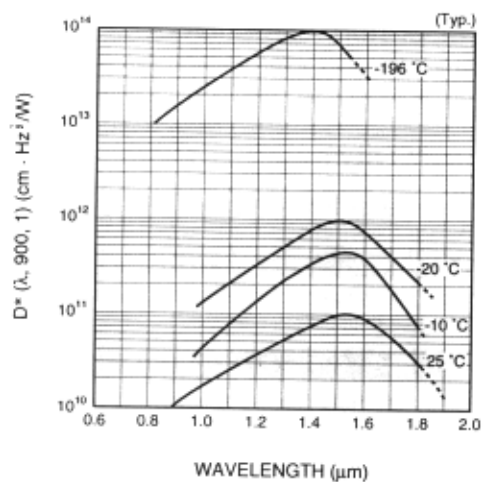
Two-stage Thermoelectrically-cooled Types

B2614-05	②	φ5	-20	1.52	0.8	24	30	30	150	330	1×10^{12}	3×10^{-13}	11	10	5
----------	---	----	-----	------	-----	----	----	----	-----	-----	--------------------	---------------------	----	----	---

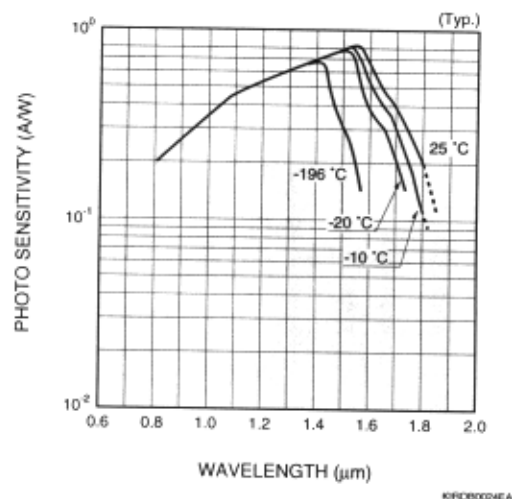
Metal Dewar Types

B6175-05	③	φ5	-196	1.4	0.75	14	18	2 (pA)	20 (pA)	5 (G Ω)	1×10^{14}	3×10^{-15}	7	3	5
----------	---	----	------	-----	------	----	----	--------	---------	-----------------	--------------------	---------------------	---	---	---

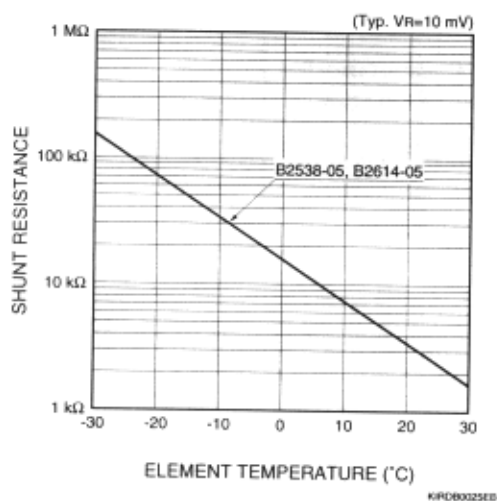
■ Spectral Response (D^*)



■ Spectral Response (Photo Sensitivity)



■ Shunt Resistance vs. Temperature



■ Connection Example (TE-cooled Types)

