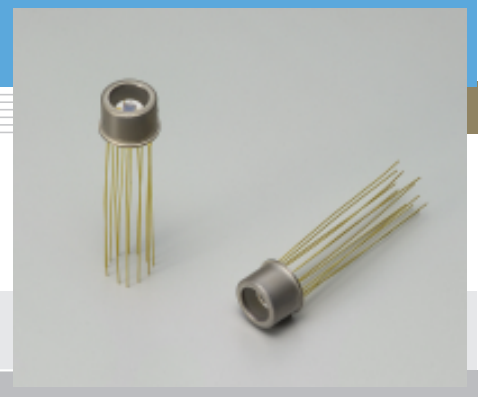


Two-color detector K3413-05/-08/-09

Wide spectral response range from UV to IR



K3413-05/-08/-09 are hybrid detectors containing an infrared-transmitting Si photodiode mounted over an InGaAs PIN photodiode, along the same optical axis. This structure delivers a wide spectral response range from 0.25 μm to nearly 1.7 μm . The built-in thermoelectric cooler maintains a constant temperature during operation, allowing precision measurement with an improved S/N ratio.

Features

- Wide spectral response range
- Allows same optical path design
- One-stage thermoelectrically cooled type

Applications

- Spectrophotometers
- Laser monitors
- Flame monitors
- Radiation thermometers

General ratings / Absolute maximum ratings

Type No.	Package	Cooling	Detector element	Active area (mm)	Absolute maximum ratings				
					Thermistor allowable dissipation (mW)	TE-cooler allowable current (A)	Reverse voltage V_R (V)	Operating temperature T_{opr} ($^{\circ}\text{C}$)	Storage temperature T_{stg} ($^{\circ}\text{C}$)
K3413-05	TO-8	One-stage TE-cooled	Si	2.4×2.4	0.2	1.5	5	-40 to +70	-55 to +85
			InGaAs	$\phi 0.5$			20		
K3413-08			Si	2.4×2.4			5		
			InGaAs	$\phi 1$			2		
K3413-09			Si	2.4×2.4			5		
			InGaAs	$\phi 1$			10		

Electrical and optical characteristics (Typ. $T_a=25^{\circ}\text{C}$, unless otherwise noted)

Type No.	Detector element	Measurement condition Element temperature T ($^{\circ}\text{C}$)	Peak sensitivity wavelength λ_p (μm)	Photo sensitivity S $\lambda=\lambda_p$ (A/W)	Dark current I_D $V_R=10\text{ mV}$		Shunt Resistance R_{sh} (M Ω)	D^* $\lambda=\lambda_p$ (cm \cdot Hz $^{1/2}$ /W)	Rise time t_r $V_R=0\text{ V}$ $R_L=1\text{ k}\Omega$ 10 to 90 % (ns)	Terminal capacitance C_t $V_R=5\text{ V}$ $f=1\text{ MHz}$ (pF)
					Typ. (nA)	Max. (nA)				
K3413-05	Si	25	0.94	0.45	50 (pA)	100 (pA)	200	1.4×10^{13}	200 *3	60 *5
	InGaAs	-10	1.55	0.55	0.05 *1	0.25 *1	3000	1.2×10^{13}	1.5 *4	12
K3413-08	Si	25	0.94	0.45	50 (pA)	100 (pA)	200	1.4×10^{13}	200 *3	60 *5
	InGaAs	-10	2.30	0.60	1.5 (μA) *2	7.5 (μA) *2	0.03	7.4×10^{10}	23 *4	200 *2
K3413-09	Si	25	0.94	0.45	50 (pA)	100 (pA)	200	1.4×10^{13}	200 *3	60 *5
	InGaAs	-10	1.55	0.55	0.07 *2	0.35 *2	1500	1.2×10^{13}	7 *4	90

*1: $V_R=5\text{ V}$

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

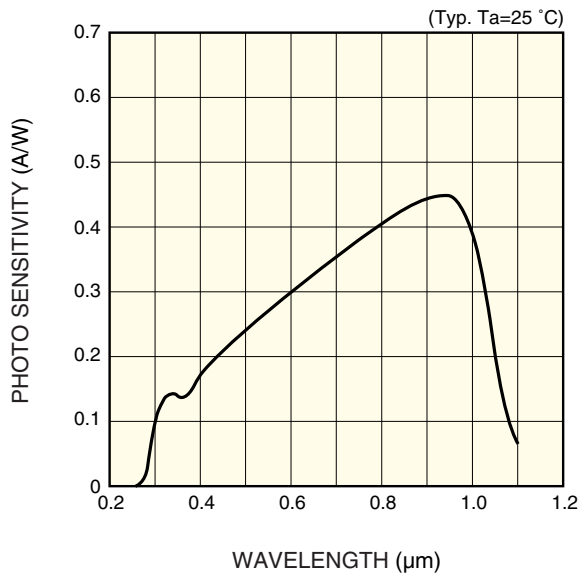
*3: $\lambda=655\text{ nm}$

*4: $V_R=5\text{ V}$, $R_L=50\ \Omega$

*5: $V_R=0\text{ V}$, $f=10\text{ kHz}$

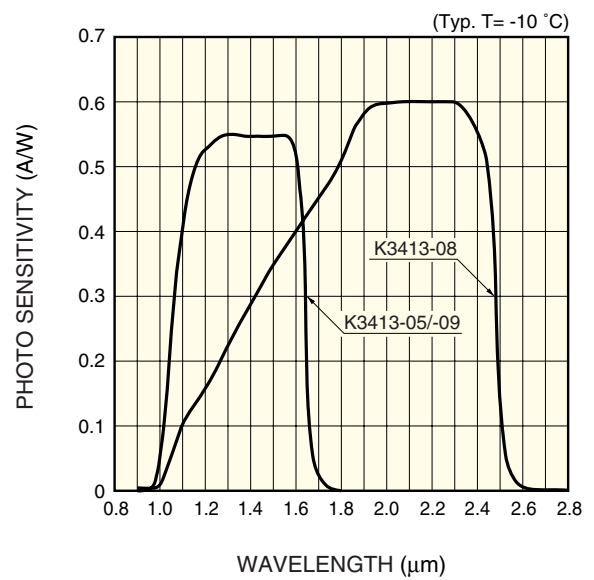
■ Spectral response

Si photodiode



KIRDB0199EA

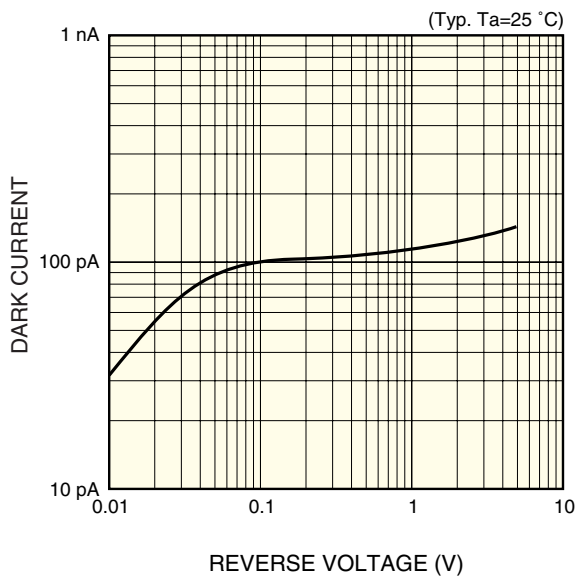
InGaAs PIN photodiode



KIRDB0212EA

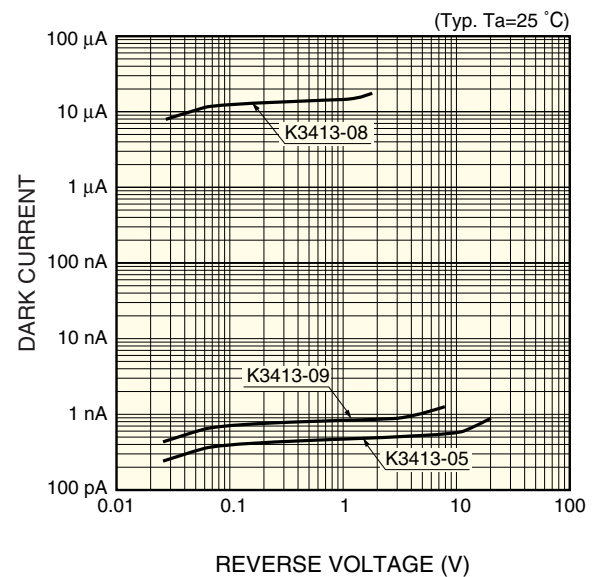
■ Dark current vs. reverse voltage

Si photodiode



KIRDB0200EA

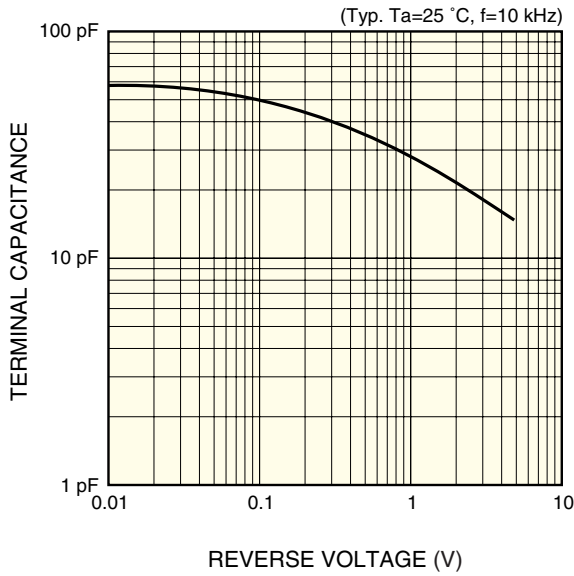
InGaAs PIN photodiode



KIRDB0213EA

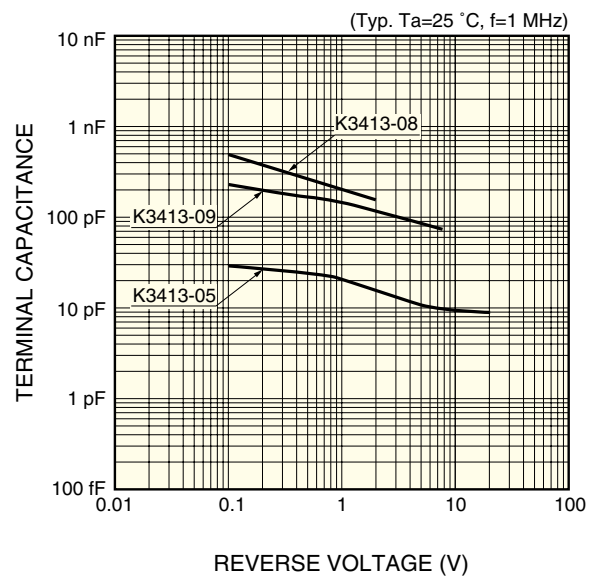
■ Terminal capacitance vs. reverse voltage

Si photodiode



KIRDB0202EA

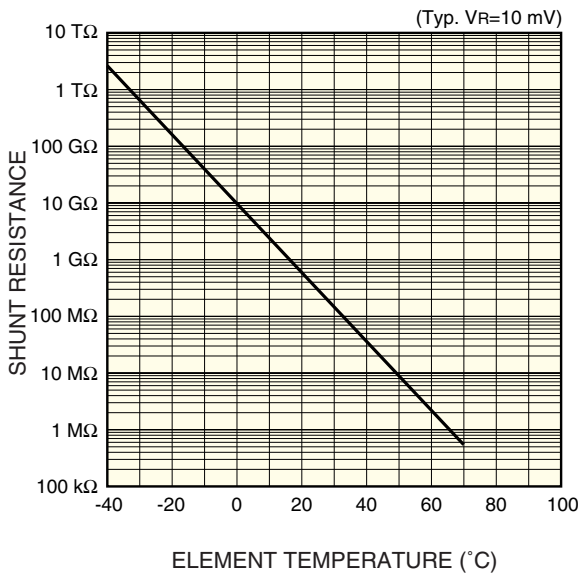
InGaAs PIN photodiode



KIRDB0214EA

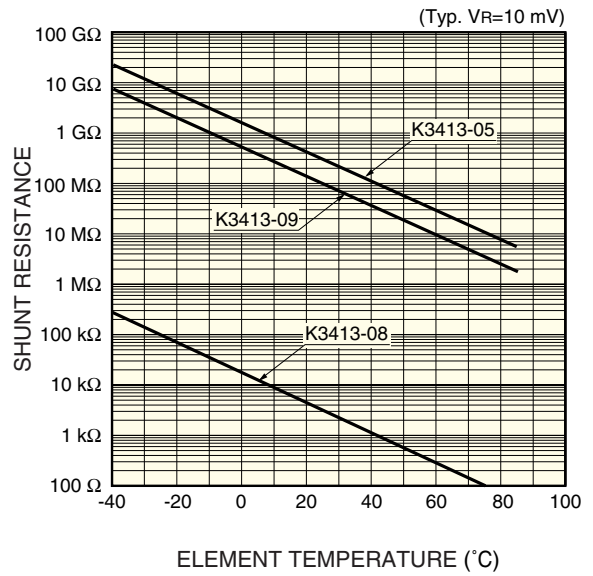
■ Shunt resistance vs. element temperature

Si photodiode



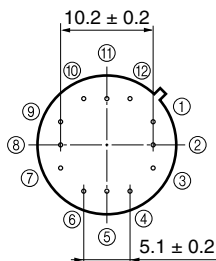
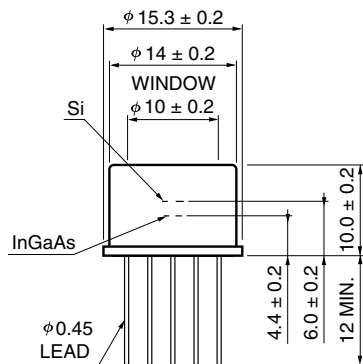
KIRDB0204EA

InGaAs PIN photodiode



KIRDB0215EA

■ Dimensional outline (unit: mm)



- ① InGaAs (ANODE)
- ② InGaAs (CATHODE)
- ③ TE-COOLER (-)
- ④ TE-COOLER (+)
- ⑤ THERMISTOR
- ⑥ Si (CATHODE)
- ⑦ Si (ANODE)

KIRDA0156ED

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