

P-CUBE-Series High Sensitivity PIN Detector Modules

Description

The P-CUBE-series manufactured by LASER COMPONENTS has been designed for customers interested in experimenting with low noise silicon or InGaAs pin detectors.

Integrated in a small package the P-CUBE-series could be assembled in to an optical set up very easy.

The optional FC connector provides a convenient method for connecting the detector to the sample using an optical fiber.

Custom designed modules and OEM versions are available on request.



Features

- Integrated Si- or InGaAs-PIN-photodiode
- Spectral range from 190 nm – 2200 nm
- Low noise
- Easy handling
- Compact

Applications

- Low-light-level detection
- Power meter
- Optical Communication Systems
- Gas Analysis
- Medical Engineering and Equipment
- Fluorescence Detector
- Spectroscopy

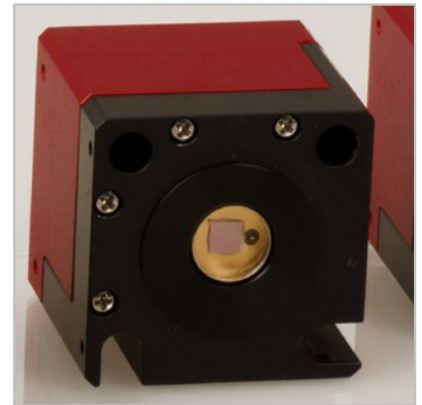
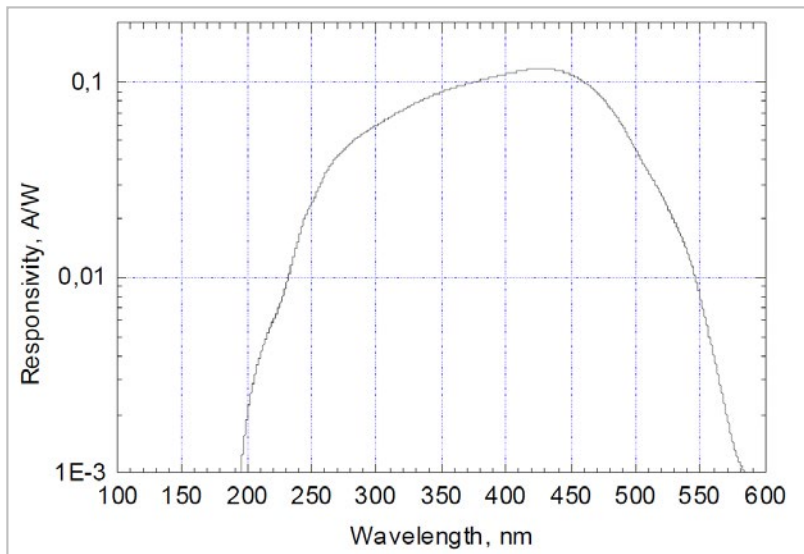
P-CUBE-10

UV optimized – GaP module

Description

The P-CUBE-10 has an integrated GaP photodiode with wide bandwidth and high spectral sensitivity in the UV and visible range (190 nm – 570 nm). The cube is a good choice for medical engineering (dermatology), output check of UV-lamps and oil or gas burner flame, measurement and control of ecological parameters, radiation control for a solarium or UV water purification facilities.

Spectral Response (Top = 25°C)



Technical Specifications (Top = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Active Area	A	-	10.90	-	mm ²
Temperature coefficient of I _D	T _C (I _D)		7.00		%/K
Operating Temperature	T _{amb}	-40	-	125	°C
Storage Temperature	T _{stg}	-40	-	125	°C
Acceptance angle at 50% S _λ	Φ		135.00		deg.

Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit
Dark Current	V _R = 5 V	I _D		20.00	80	pA
Peak sensitivity wavelength	V _R = 0 V	λ _p		440.00		nm
Responsivity at λ _p	V _R = 0 V	S _λ	0.13	0.16		A/W
Sensitivity range at 1%	V _R = 0 V	λ _{min} , λ _{max}	190		570	nm
Spectral bandwidth at 50%	V _R = 0 V			180		nm
Shunt Impedance	V _R = 10 mV		50	70		GΩ
Noise equivalent power	λ=440 nm	NEP		1.5E-14		W/√Hz
Specific detectivity	λ=440 nm	D*		2.2E+12		cm * √Hz * W ⁻¹
Junction capacitance	V _R = 0 V	C _J		2.6		nF

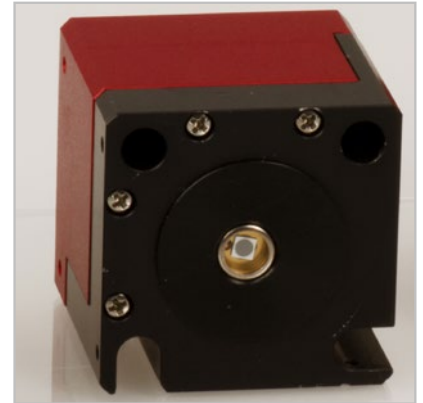
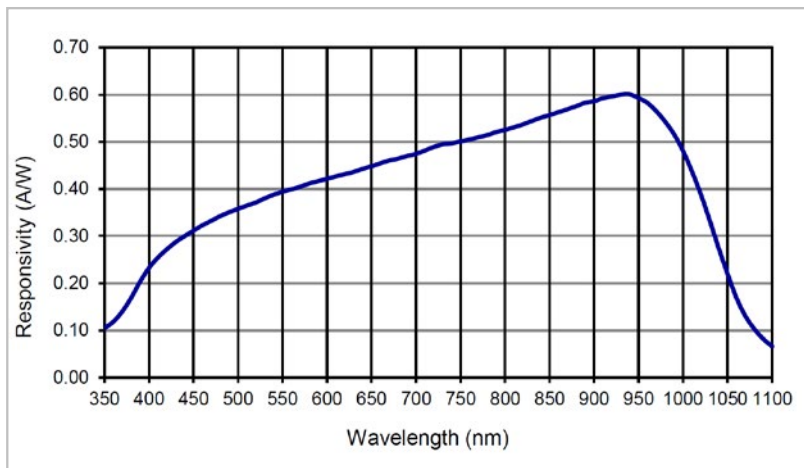
P-CUBE-20

Blue enhanced – Si module

Description

The P-CUBE-20 has an integrated blue enhanced photodiode with high speed and high spectral sensitivity in the UV, visible and NIR range (200 nm – 1050 nm). The cube is a good choice for UV exposure measurements, pollution monitoring, medical equipment or fluorescence detection.

Spectral Response (Top = 23°C)



Technical Specifications (Top = 23°C)

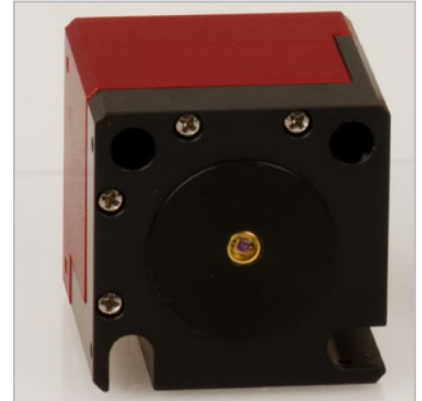
Parameter	Symbol	Min.	Typ.	Max.	Unit
Diameter of Active Area	\varnothing		2.52		mm
Active Area	A	-	5	-	mm ²
Operating Temperature	T_{amb}	-40	-	100	°C
Storage Temperature	T_{stg}	-55	-	125	°C
Max Reverse Voltage	V_{max}			50	V
Peak DC Current				10	mA

Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit
Dark Current	$V_R = 5\text{ V}$	I_D		0.1		nA
Responsivity	$\lambda = 410\text{ nm}$			0.22		A/W
	$\lambda = 550\text{ nm}$			0.37		A/W
Rise Time	$V_R = 0\text{ V};$ $\lambda = 410\text{ nm}$ $R_L = 50\ \Omega$	t_r		100		ns
	$V_R = 5\text{ V};$ $\lambda = 410\text{ nm}$ $R_L = 50\ \Omega$	t_r		20		ns
Break Down Voltage	$I_R = 2\ \mu\text{A}$	V_{BR}	30	50		V
Shunt Resistance	$V_R = 10\text{ mV}$		400	600		M Ω
Noise equivalent power	$V_R = 5\text{ V}$ $\lambda = 410\text{ nm}$	NEP		2.60E-14		W/ $\sqrt{\text{Hz}}$
Capacitance	$V_R = 0\text{ V}$	C		65		pF
	$V_R = 5\text{ V}$	C		20		pF

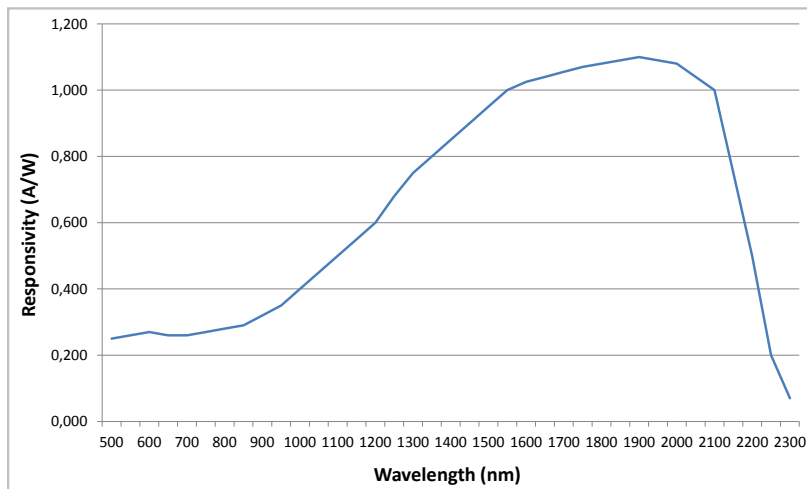
P-CUBE-40 Enhanced InGaAs module

Description

The P-CUBE-40 has an integrated high performance InGaAs photodiode operating over the spectral range from 800 nm to 2200 nm. This detector provides fast rise time, uniformity of response, excellent sensitivity, and long term reliability for a wide range of applications (Gas analysis, Raman spectroscopy, IR fluorescence, Chemical detection, Optical communication, Optical power monitoring, Laser diode monitoring)



Spectral Response (Top = 23°C)

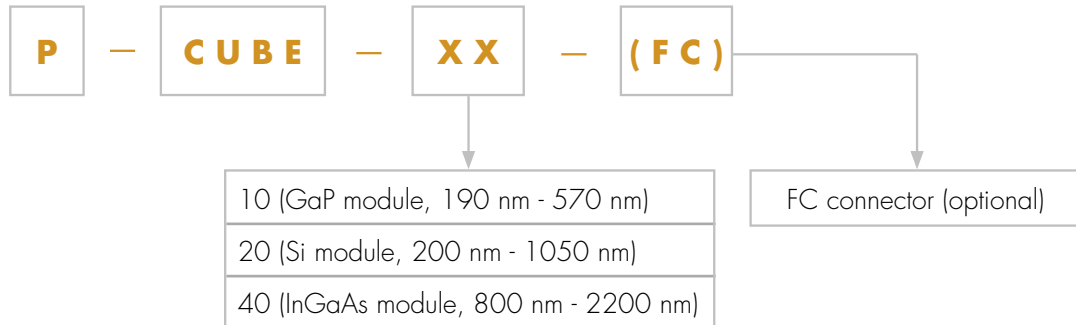


Technical Specifications (Top = 23°C)

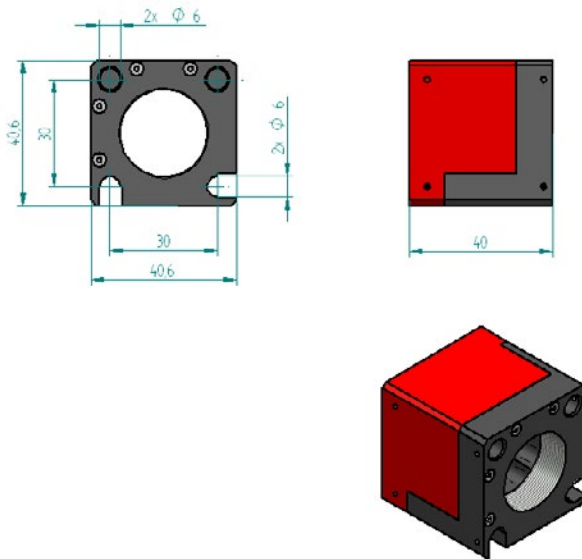
Parameter	Symbol	Min.	Typ.	Max.	Unit
Diameter of Active Area	\varnothing		0.25		mm
Operating Temperature	T_{amb}	-40	-	85	°C
Storage Temperature	T_{stg}	-40	-	125	°C
Max Reverse Voltage	V_{Rmax}		0.50		V

Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit
Dark Current	V_{Rmax}	I_D		0.70	1	nA
Peak sensitivity wavelength	$V_R = 0\text{ V}$	λ_p		1900		nm
Responsivity at λ_p	$V_R = 0\text{ V}$	S_λ	1.1			A/W
Shunt Impedance	$V_R = 10\text{ mV}$		250			k Ω
Specific detectivity	1 kHz	D^*	1.20E+05			cm [*] √Hz*W ⁻¹
Noise Equivalent Power	$\lambda = 1900\text{ nm}$	NEP		1.20E-13		W/√Hz

Product Number Designation



Package Drawings



Dimensions in [mm]