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. In combination with our low-noise, programmable current amplifier iAMP-700 the pin modules are suitable for applications where a transformation from small signals into manageable output voltages are required.

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
- Compatible with iAMP-700 (application note available on request)

Applications

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

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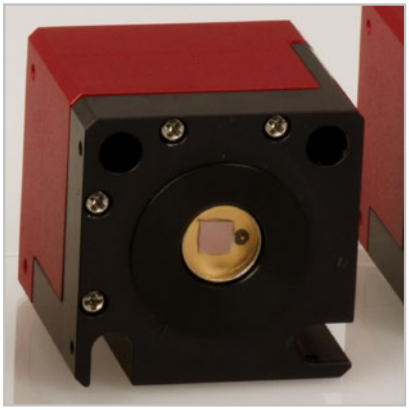
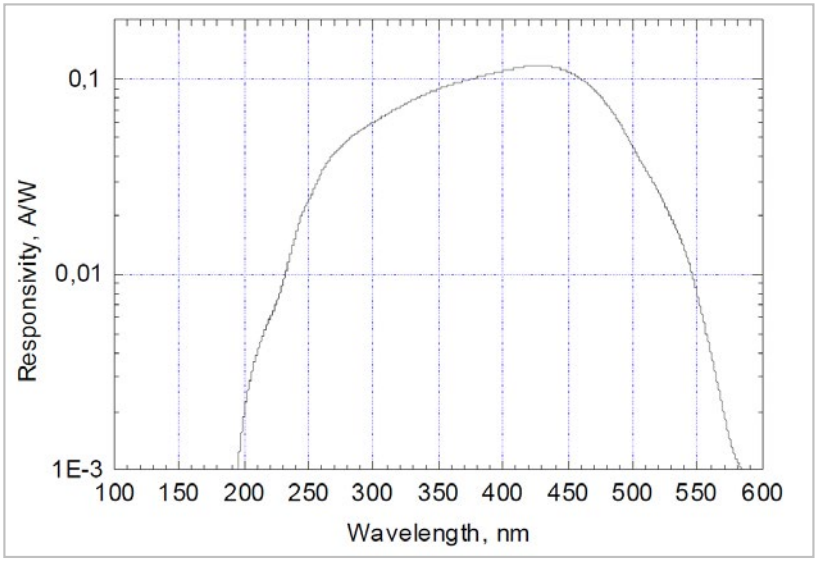
P-CUBE-10
UV optimized – GaP module

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)



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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% Sλ	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
Responsitivity 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

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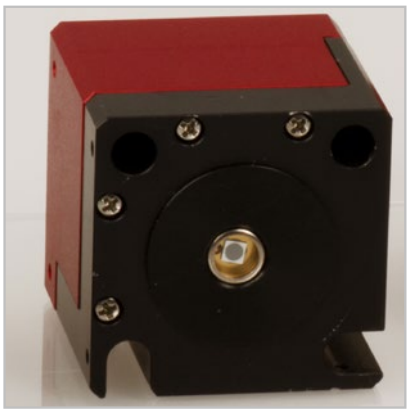
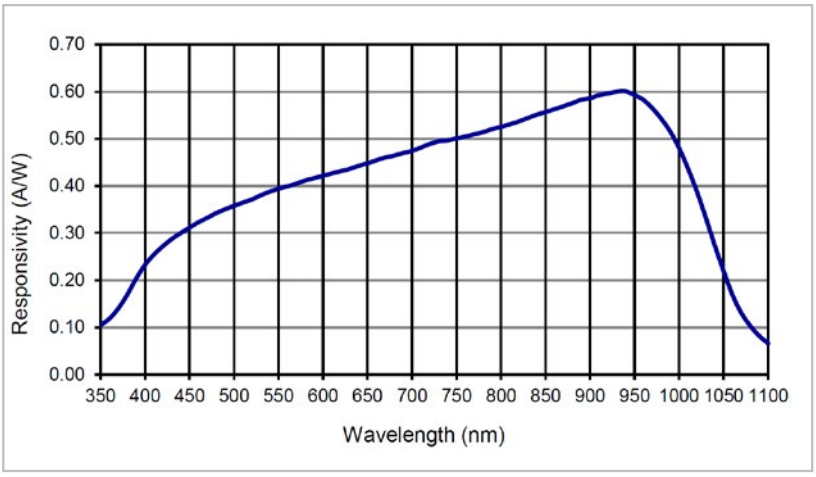
P-CUBE-20
Blue enhanced – Si module

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)



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P-CUBE-Series
High Sensitive PIN Detector Modules

Technical Specifications (Top = 23°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Diameter of Active Area	∅		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 V	I_D		0.1		nA
Responsivity	λ= 410 nm			0.22		A/W
	λ= 550 nm			0.37		A/W
Rise Time	V_R= 0 V; λ= 410 nm R_L= 50 Ω	t_r		100		ns
	V_R= 5 V; λ= 410 nm R_L= 50 Ω	t_r		20		ns
Break Down Voltage	I_R= 2 µA	V_{BR}	30	50		V
Shunt Resistance	V_R= 10 mV		400	600		MΩ
Noise equivalent power	V_R= 5 V λ=410 nm	NEP		2.60E-14		W/√Hz
Capacitance	V_R= 0 V	C		65		pF
	V_R= 5 V	C		20		pF

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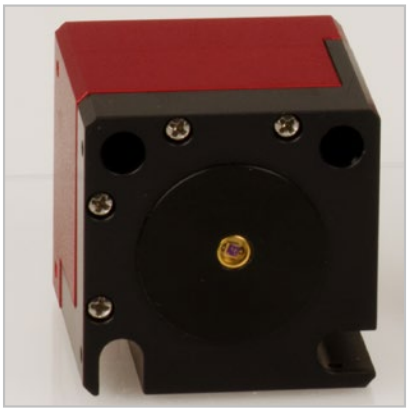
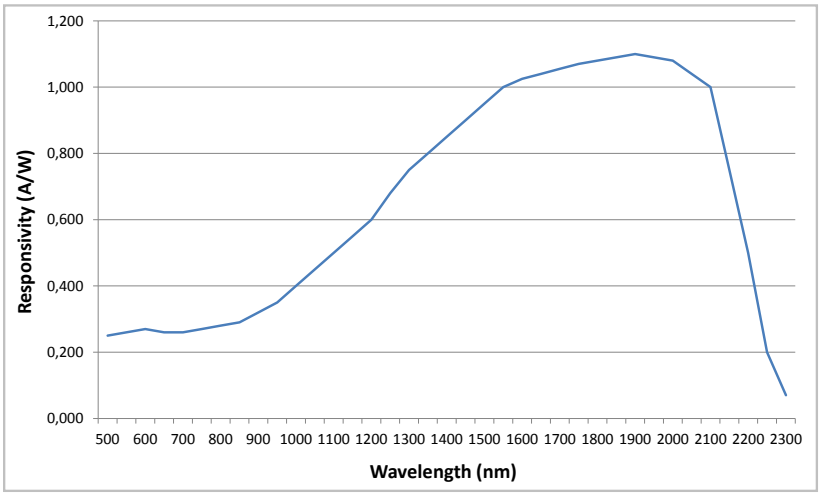
P-CUBE-40
Enhanced InGaAs module

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)



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Technical Specifications (Top = 23°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Diameter of Active Area	∅		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 V	λ_P		1900		nm
Responsitivity at λ_P	V_R= 0 V	S_λ	1.1			A/W
Shunt Impedance	V_R= 10 mV		250			kΩ
Specific detectivity	1 kHz	D*	1.20E+05			cm*√Hz*W^{-1}
Noise Equivalent Power	λ= 1900 nm	NEP		1.20E-13		W/√Hz

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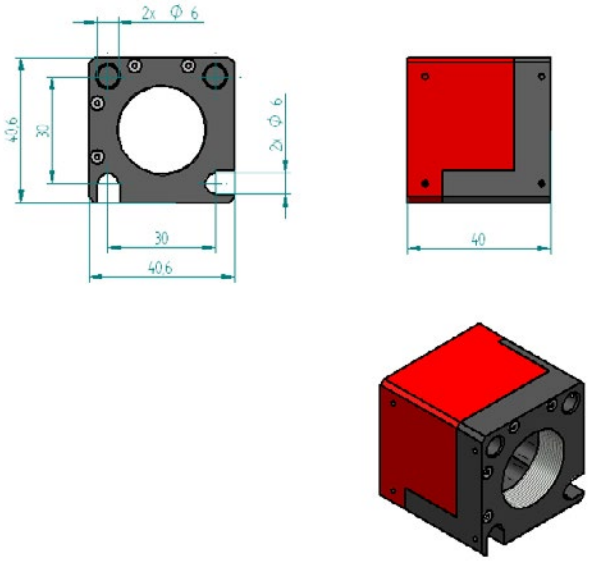
P-CUBE-Series
High Sensitive PIN Detector Modules

Product Number Designation

P – CUBE – XX – (FC)

XX	(FC)
10 (GaP module, 190 nm - 570 nm)	FC connector (optional)
20 (Si module, 200 nm - 1050 nm)	
40 (InGaAs module, 800 nm - 2200 nm)	

Package Drawings



Dimensions in [mm]

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