

APD Module LCSA/LCIA-Series

DESCRIPTION

Laser Components' new range of APD modules has been designed for customers interested in experimenting with APDs. Featuring a low-noise silicon (or InGaAs) APD with matched preamplifier and integrated high voltage supply, the module offers everything needed to operate APDs easily and conveniently. In-built temperature compensation circuitry allows the APD to be operated at constant gain even if the ambient temperature changes. A 12 V DC supply is all that is needed to operate the module. The metal housing is fully nickel-plated, in order to reduce EMI emissions from the module, and to protect the module from any external EMI. Custom designed modules and OEM versions are available on request.



FEATURES

- High sensitivity
- Low noise
- Easy handling
- Single 12 V DC supply operation
- Compact

APPLICATIONS

- APD evaluation
- Range finding / LIDAR
- Optical Communication Systems
- Laser Scanners
- Spectroscopy
- Fluorescence
- Medical



Si-APD module

GENERIC CHARACTERISTICS At T = 25 °C

	Min.	Typ.	Max.	Units
Wavelength Range	400		1100	nm
Peak Sensitivity		905		nm

ABSOLUTE MAXIMUM RATINGS

	Min.	Typ.	Max.	Units
Supply Voltage		+ 12	+ 13.5	V
Operating Temperature	0		+ 50	°C
Storage Temperature	- 20		+ 70	°C
Maximum incident light level (cw operation)			10	mW
Output Voltage (50 Ω) (typical)			+ 1.6	V
(1 MΩ) (typical)			+ 2.5	V

TECHNICAL SPECIFICATIONS FOR 0.5 mm Si-APD-MODULE

Part Number	LCSA500-01	LCSA500-03	LCSA500-10	LCSA500-25	Units
Si-APD	SAR500	SAR500	SAR500	SAR500	
Active Area Diameter	0.5	0.5	0.5	0.5	mm
Wavelength Range	400 – 1000	400 – 1000	400 – 1000	400 – 1000	nm
Peak Sensitivity	905	905	905	905	nm
Bandwidth	DC – 1	DC – 3	DC – 10	DC – 25	MHz
Responsivity (minimum)					
540 nm	270	27	2.7	0.27	MV/W
650 nm	360	36	4	0.4	MV/W
905 nm	440	50	5	0.5	MV/W
NEP (maximum)					
540 nm	0.037	0.111	0.185	0.556	pW/rHz
650 nm	0.028	0.083	0.125	0.375	pW/rHz
905 nm	0.022	0.06	0.1	0.3	pW/rHz
Output Noise Density (maximum)	10000	3000	500	150	nV/rHz
Input Referred Noise Density (maximum)	1	3	5	15	pA/rHz

Note: Noise measured at 100 kHz



TECHNICAL SPECIFICATIONS FOR 1.5 mm Si-APD-Module

Part Number	LCSA1500-01	LCSA1500-03	LCSA1500-10	LCSA1500-25	Units
Si-APD	SAR1500	SAR1500	SAR1500	SAR1500	
Diameter	1.5	1.5	1.5	1.5	mm
Wavelength Range	400 – 1000	400 – 1000	400 – 1000	400 – 1000	nm
Peak Sensitivity	905	905	905	905	nm
Bandwidth	DC – 1	DC – 3	DC – 10	DC – 25	MHz
Responsivity (minimum)					
540 nm	270	27	2.7	0.27	MV/W
650 nm	360	36	4	0.4	MV/W
905 nm	440	50	5	0.5	MV/W
NEP (maximum)					
540 nm	0.037	0.111	0.185	0.556	pW/rHz
650 nm	0.028	0.083	0.125	0.375	pW/rHz
905 nm	0.022	0.06	0.1	0.3	pW/rHz
Output Noise Density (maximum)	10000	3000	500	150	nV/rHz
Input Referred Noise Density (maximum)	1	3	5	15	pA/rHz

Note:

Noise measured at 100 kHz.

LCSA1500-01 and LCSA1500-03 will saturate with high background light levels due to their very high sensitivity.

Operation in environments with high background levels (e.g. daylight) is therefore not recommended.

TECHNICAL SPECIFICATIONS FOR 3 mm Si-APD-Module

Part Number	LCSA3000-01	LCSA3000-03	LCSA3000-10	LCSA3000-25	Units
Si-APD	SAR3000	SAR3000	SAR3000	SAR3000	
					Units
Diameter	3	3	3	3	mm
Wavelength Range	400 – 1000	400 – 1000	400 – 1000	400 – 1000	nm
Peak Sensitivity	905	905	905	905	nm
Bandwidth	DC – 1	DC – 3	DC – 10	DC – 25	MHz
Responsivity (minimum)					
540 nm	270	27	2.7	0.27	MV/W
650 nm	360	36	4	0.4	MV/W
905 nm	440	50	5	0.5	MV/W
NEP (maximum)					
540 nm	0.037	0.111	0.185	0.037	pW/rHz
650 nm	0.028	0.083	0.125	0.375	pW/rHz
905 nm	0.022	0.06	0.1	0.3	pW/rHz
Output Noise Density (maximum)	10000	3000	500	150	nV/rHz
Input Referred Noise Density (maximum)	1	3	5	15	pA/rHz

Note:

Noise measured at 100 kHz.

LCSA3000-01 and LCSA3000-03 will saturate with high background light levels due to their very high sensitivity.

Operation in environments with high background levels (e.g. daylight) is therefore not recommended.



InGaAs-APD module

GENERIC CHARACTERISTICS At T = 25 °C

	Min.	Typ.	Max.	Units
Wavelength Range	1000		1650	nm
Peak Sensitivity		1550		nm

ABSOLUTE MAXIMUM RATINGS

	Min.	Typ.	Max.	Units
Supply Voltage		+ 12	+ 13.5	V
Operating Temperature	0		+ 50	°C
Storage Temperature	- 20		+ 70	°C
Maximum incident light level (cw operation)			10	mW
Output Voltage			+ 2.5	V

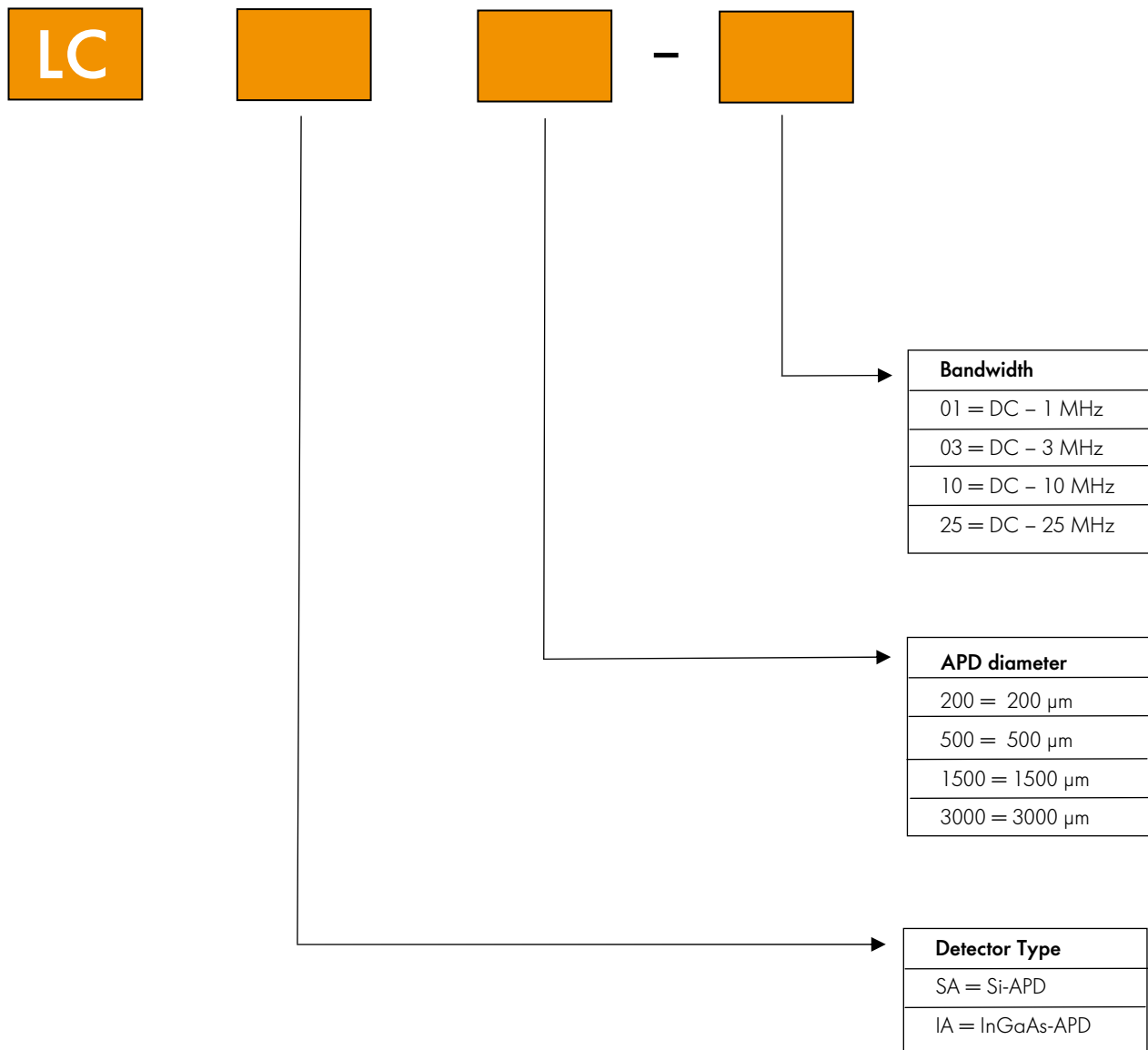
TECHNICAL SPECIFICATIONS FOR 200 µm InGaAs-APD-MODULES

Part Number	LCIA200-01	LCIA200-03	LCIA200-10	LCIA200-25	Units
InGaAs-APD	IAE200	IAE200	IAE200	IAE200	
Diameter	200	200	200	200	µm
Wavelength Range	900 – 1700	900 – 1700	900 – 1700	900 – 1700	nm
Peak Sensitivity	1550	1550	1550	1550	nm
Bandwidth	DC – 1	DC – 3	DC – 10	DC – 25	MHz
Responsivity (minimum)					
1550 nm	80	8	0.8	0.08	MV/W
NEP (maximum)					
1550 nm	0.125	0.375	0.625	1.875	pW/rtHz
Output Noise Density (maximum)	10000	3000	500	150	nV/rtHz
Input Referred Noise Density (maximum)	1	3	5	15	pA/rtHz

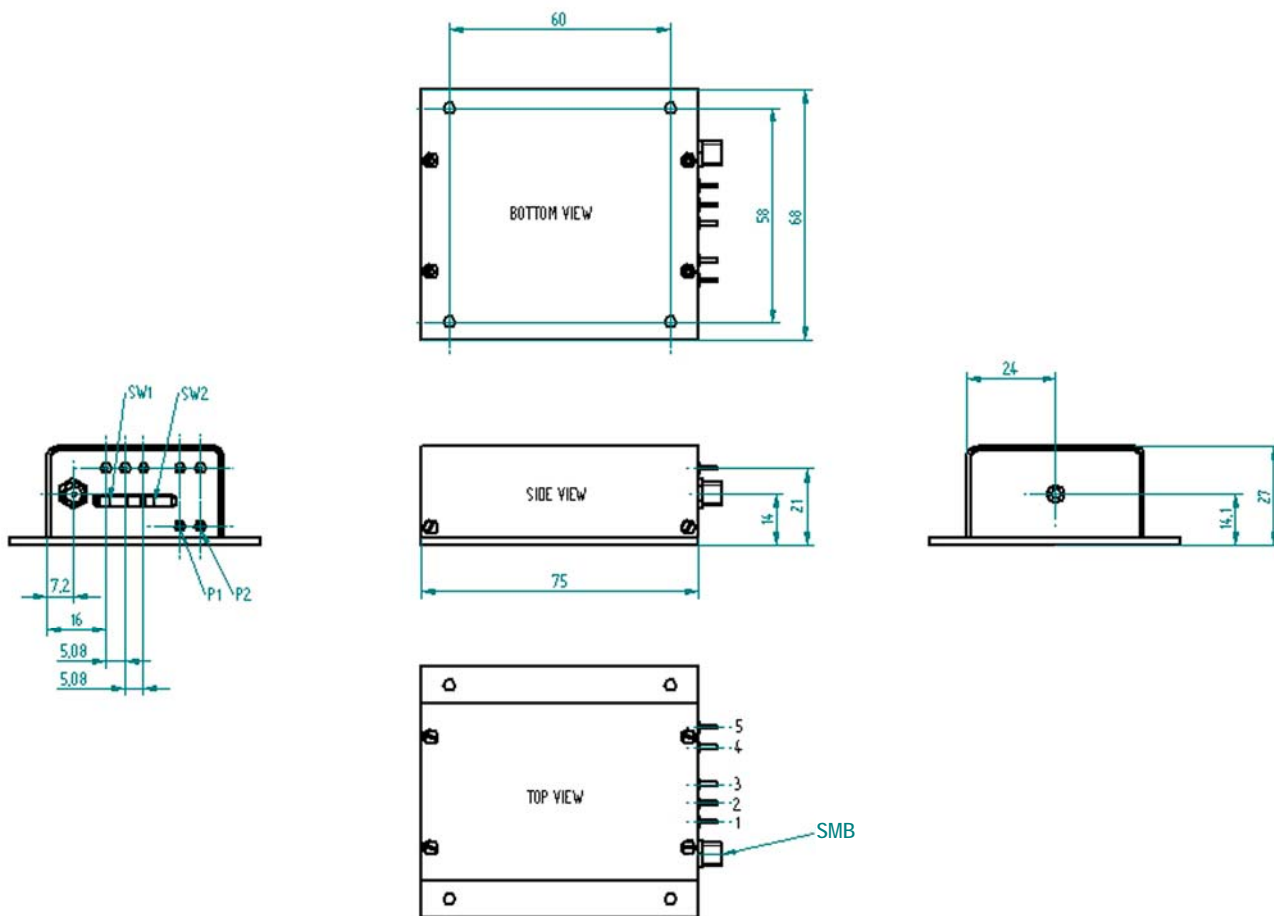
Note: Noise measured at 100 kHz



PRODUCT NUMBER DESIGNATIONS



PACKAGE DRAWINGS



Other packages and OEM versions are available on request.

PIN CONFIGURATION

Pin	Name	Function	Characteristic
1	+ VB	Supply Voltage	+ 12 V DC (typical)
2	GND	Ground	-
3	V _{mon}	Monitor	[0 ... 5] V
4		R _{TK}	Poti
5		R _{TK}	Poti
SW1		ADJ / T _{com}	-
SW2		R _{TK}	on/off
P1		HV (Gain)	-
P2		R _{TK}	-

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