

PD 100

Silicon and InGaAs photodiodes for fast power measurement

Key features at a glance

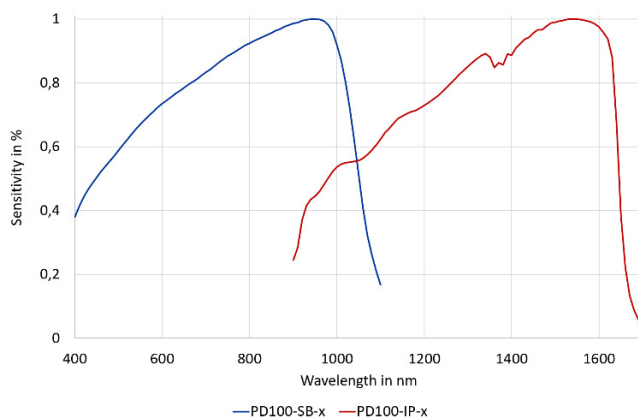
- ▲ Si: 400 – 1100 nm / InGaAs: 900 – 1700 nm
- ▲ Short rise/fall times for measurement of pulsed sources
- ▲ Calibration data in 10 nm steps stored on PD 100
- ▲ Integration in DLL or SpecWin Pro (from V4.0): Calculation of absolute power from PD readout, calibration data and DUT spectrum; LIV measurement support



The PD 100 photodiodes are Instrument Systems' high-performance detectors for emission power measurements of devices in the VIS to NIR spectral region, covering a spectral range from 400 nm up to 1100 nm (Si) and 900 nm to 1700 nm (InGaAs).

\\ FUNCTIONALITY

The photodiode enables fast measurement of radiant power, increasing productivity in production line applications and extends the measurement range of a spectroradiometer to low optical power, ideal for very weak sources. With the slanted design, the photodiode is fully compatible to Instrument Systems' integrating sphere portfolio ISP*B and ISP*PTFE with optically optimized port design. The PD 100 will not intersect the measurement plane making it ideal for moving applications in the machine environment.



▲ Sensitivity of PD 100 vs. wavelength (relative).

\\ CALIBRATION

The PD 100 is calibrated in 10 nm steps, with calibration data stored on the PD 100. These data can be read via the integrated USB and processed with the DLL or the SpecWin Pro user interface (from version 4.0) to provide absolute power readings.

Calibration	Available for	Wavelength range
CAL-1001	PD100-SB-*	400 nm – 1100 nm
CAL-1002	PD100-IP-*	900 nm – 1700 nm



▲ PD 100 photodiode mounted on an ISP integrating sphere.

\\ TECHNICAL SPECIFICATIONS

Model	PD100-SB-0001	PD100-SB-0002	PD100-IP-0001	PD100-IP-0002 (not calibratable)
General				
Detector material	Silicon (Si)		IndiumGalliumArsenide (InGaAs)	
Spectral range	400 – 1100 nm		900 – 1700 nm	
Peak sensitivity wavelength	960 nm		1550 nm	
Active diameter/area	5.8 mm x 5.8 mm		Ø 3 mm	
Rise/Fall time	40 µs (typ.)		5 µs (typ.)	
Typical conversion factor (ISP 100)	240 V/W (@ 940nm)	28 V/W (@ 940 nm)	2700 V/W (@ 1380 nm)	~12.5 V/W (@ 1380 nm)
Electrical data				
Output voltage	0 – 5 V		0 – 4 V	
Signal output	SMA			
Power supply	24 VDC			
PC interface	USB-B (calibration data, type, serial number)			
Miscellaneous				
Dimensions	Length: 53.4 mm, Diameter: 55 mm			
Operating conditions	Temperature: +15 °C to +35 °C (Ideal: +23 °C ±3 °C) Humidity: 70 % rH, non condensing (Ideal: 45 % ±10 %)			
Weight	0.16 kg			
Mechanical interface (flange) to	ISP 75B (BaSO ₄) ISP 100B (BaSO ₄)	ISP 75B (BaSO ₄) ISP 100B (BaSO ₄)	ISP 75-PTFE ISP 100-PTFE ISP 150-PTFE ISP 250-PTFE	ISP 75-PTFE ISP 100-PTFE ISP 150-PTFE ISP 250-PTFE
Valid standards	Tested and approved for operation in Europe, South Korea and North America.			

\\ TECHNICAL SPECIFICATIONS

Si models	PD100-SB-0001		PD100-SB-0002	
Mounted on /@ wavelength	ISP 75B (BaSo ₄)	ISP 100B (BaSo ₄)	ISP 75B (BaSo ₄)	ISP 100B (BaSo ₄)
Power range				
@ 450 nm (blue)	1 μW – 27 mW	2 μW – 42 mW	10 μW – 250 mW	15 μW – 350 mW
@ 550 nm (green)	800 nW – 20 mW	1.3 μW – 31 mW	7.5 μW – 195 mW	11 μW – 260 mW
@ 630 nm (red)	700 nW – 18 mW	1.2 μW – 28 mW	6.5 μW – 166 mW	10 μW – 230 mW
@ 940 nm	530 nW – 13 mW	900 nW – 21 mW	5 μW – 123 mW	7 μW – 180 mW
Measurement uncertainties				
400 – 449 nm	> 4 %	> 4 %	> 10 %	> 15 %
450 – 509 nm	1.5 – 3 %	1.5 – 3 %	3 – 8 %	5 – 10 %
510 – 599 nm	1 %	1 %	2 – 3 %	3 – 4 %
600 – 999 nm	1 %	1 %	1.5 – 2 %	2 – 2.5 %
1000 – 1100 nm	1 – 3 %	1 – 3 %	1.5 – 8 %	2 – 10 %

InGaAs models	PD100-IP-0001				PD100-IP-0002 (not calibratable)
Mounted on /@ wavelength	ISP 75-PTFE	ISP 100-PTFE	ISP 150-PTFE	ISP 250-PTFE	ISP *-PTFE
Power range					
@ 1050 nm	1.1 μW – 0.5 mW	2 μW – 1 mW	4.6 μW – 2.2 mW	12.7 μW – 6.1 mW	Developed for higher power up to approx. 200 μW – 1 W depending on ISP size.
@ 1380 nm	1.8 μW – 0.8 mW	3.2 μW – 1.5 mW	7.2 μW – 3.4 mW	20 μW – 9.6 mW	
Measurement uncertainties					
900 – 999 nm	2.5 – 4 %				-
1000 – 1109 nm	2.5 %				-
1110 – 1409 nm	1 – 1.5 %				-
1410 – 1659 nm	1.5 – 4.5 %				-
1660 – 1700 nm	> 9 %				-

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