

Four Quadrant Photodiode PR5471 / 5472 / 5473



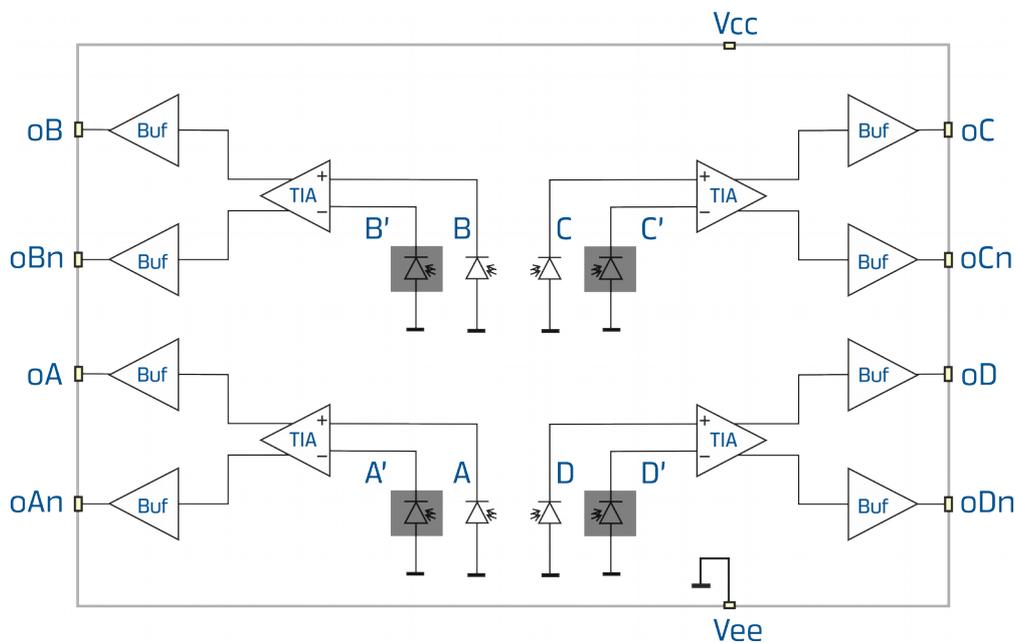
4-Quadrant Photodiodes with Voltage Output

PR547x are 4-Quadrant Photodiodes with photocurrent amplifier and voltage output. Interference and reflection on the photodiodes are reduced by an antireflective layer. Three different versions PR5471/2/3 are available with different electrical gains of 10, 25 and 100 mV output voltage per nA of photocurrent.

APPLICATIONS

- Light beam alignment
- 2D optical tracking
- tilt sensor

BLOCK DIAGRAM



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Electrical Characteristics

ABSOLUTE MAXIMUM RATINGS

Parameter	Min	Typ	Max	Units
V _{CC} (supply voltage)	-0.3		8	V
V _{PIN} (voltage @ other pins)	-0.3		V _{CC} +0.3	V
Storage Temperature Range	-55		125	°C
T _J (Junction Temperature)	-40		125	°C
Electrostatic Discharge (ESD) Protection @ all pins		HBM	4	kV

OPERATING CHARACTERISTICS

V_{CC} = 3.3 V, T_J = -40...85°C (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
V _{CC}	Supply voltage		3.0	3.3	5.5	V
I _{CC}	Supply current (no load)					mA
BW	Bandwidth			350		kHz

Output characteristics

V _O	Output voltage	no lighting		V _{CC} /2		V
V _{out}	Output voltage range	V _{CC} = 3.3 V	V _{CC} /2-0.75		V _{CC} /2+0.75	V
		V _{CC} = 5.0 V	V _{CC} /2-1.0		V _{CC} /2+1.0	V
I _{out}	Output current	V _{out} = V _{CC} /2±0.75V	-0.1		0.1	mA
S	Sensitivity (output differential voltage vs. photocurrent)	PR5471 PR5472 PR5473		25 100 10		mV/nA mV/nA mV/nA

Photosensors

A _{PD}	Photodiode active area	per channel		0.47		mm ²
λ _{ar}	Spectral application range	Se(λ _{ar})=0.25*λ _{peak}	400		1050	nm
λ _{peak}	Peak sensitivity	@ 800 nm		0.38		A/W

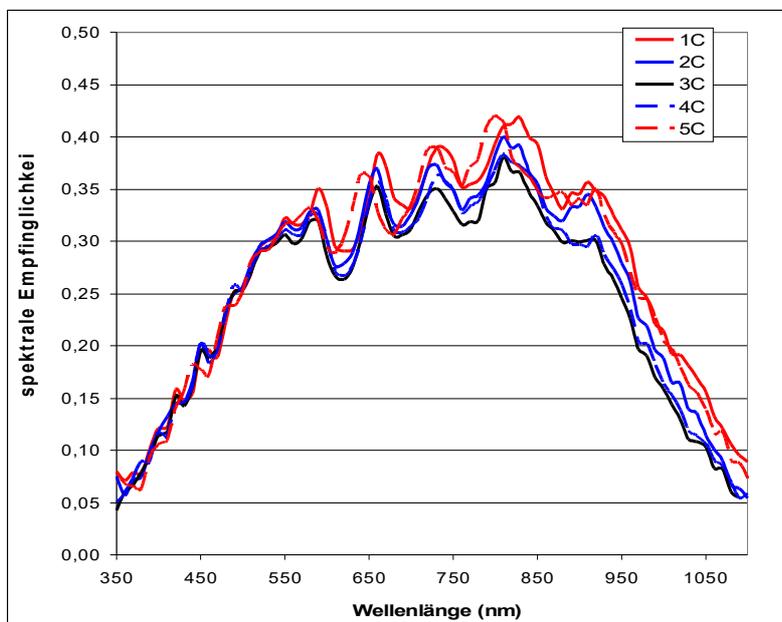
Thermal properties

T _J	Junction temperature	operating	-40		85	°C
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SPECTRAL SENSITIVITY

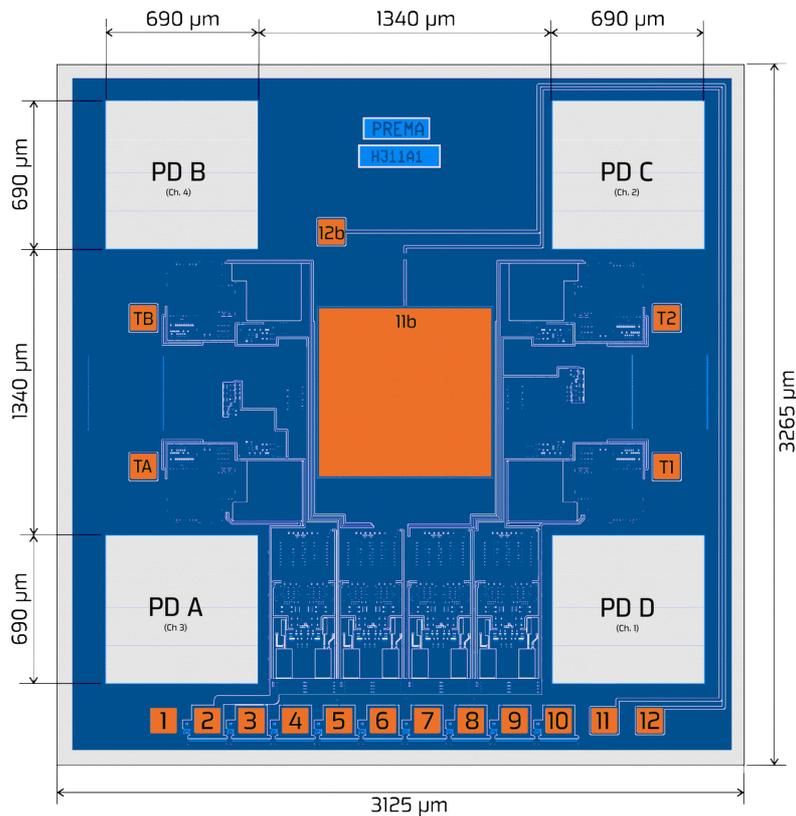


Spectral sensitivity in A/W as function of the wavelength in nm for different samples. The position of local minima and maxima may vary.

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Photodiodes – Dimensions



General dimensions:

- Die size: 3,125 µm x 3,265 µm (measured between centres of scribe lane)
- Photodiodes active area: approx. 690 µm x 690 µm x 4
- Pad window: 120 µm x 120 µm

PAD DESCRIPTION

Pin No	Pin Name	Pin Function Description
1	Vee	negative supply voltage
2	Vcc	positive supply voltage
3	oDn	D channel negative output
4	oD	D channel positive output
5	oCn	C channel negative output
6	oC	C channel positive output
7	oBn	B channel negative output

Pin No	Pin Name	Pin Function Description
8	oB	B channel positive output
9	oAn	A channel negative output
10	oA	A channel positive output
11/11b	LED_BS	LED backside connection
12/12b	LED_TS	LED topside connection

Test pads are to be used for chip test only and not described in this document.

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