

Dual Photodiode PR5001 /-ARC



2 Photodiodes in One Chip for Spacially Resolved Light Detection

The PR5001 is a dual-element Si photodiode moulded into a small plastic leadless optical package. Produced as one chip, the photodiodes offer a very good symmetry, low dark current and high sensitivity.

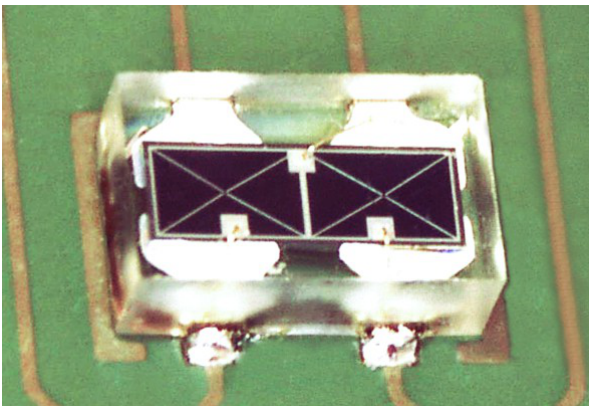
Apart from the standard version **PR5001**, the **PR5001-ARC** features an antireflective layer, smoothing the spectral sensitivity and providing a high good matching from part to part.

FEATURES

- Low dark current
- Low capacitance
- Good matching between photodiodes

TYPICAL APPLICATIONS

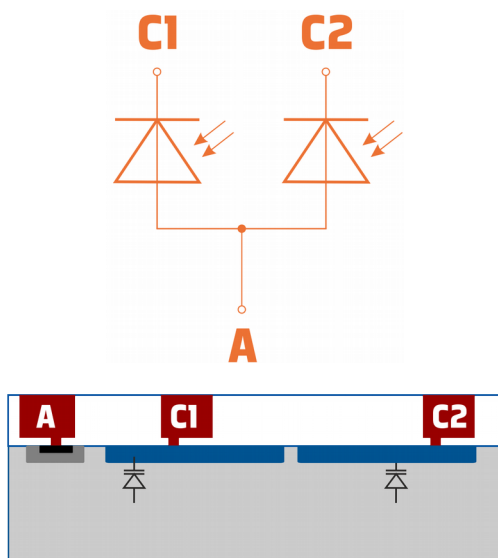
- Laser beam alignment
- Opto encoders
- Position detection
- Differential light measurement



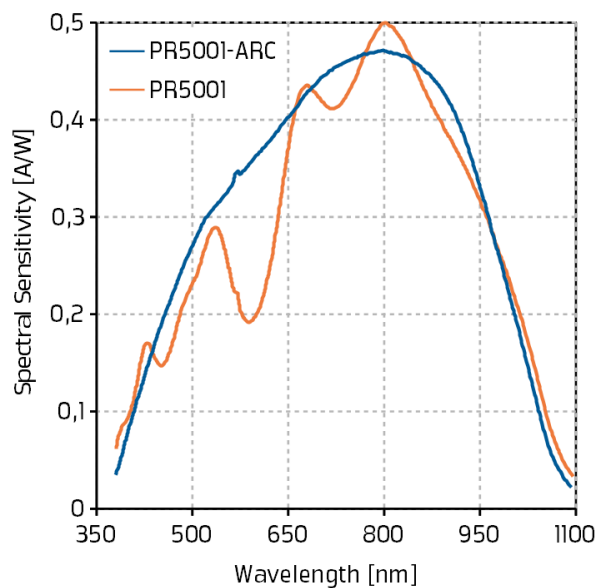
KEY CHARACTERISTICS

Parameter	Typ	Unit
package size	2,9 x 1,8 x 0,9	mm ³
photodiode size	2 x 0,78	mm ²
peak wavelength (-ARC)	800	nm
dark current @ 40°C / Vr = 1 V	14	pA
capacitance @ Vr = 2 V	40	pF

CIRCUIT



SPECTRAL SENSITIVITY



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Electrical and optical Characteristics

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Units
V_{C-A}	$V(A) - V(C1, C2)$	-0,3	35	V
T_S	storage temperature	-40	85	°C
T_{peak}	soldering peak temperature		260	°C
P_{tot}	total power dissipation		100	mW

ELECTRICAL CHARACTERISTICS

Ta = 27°C, unless otherwise noted.

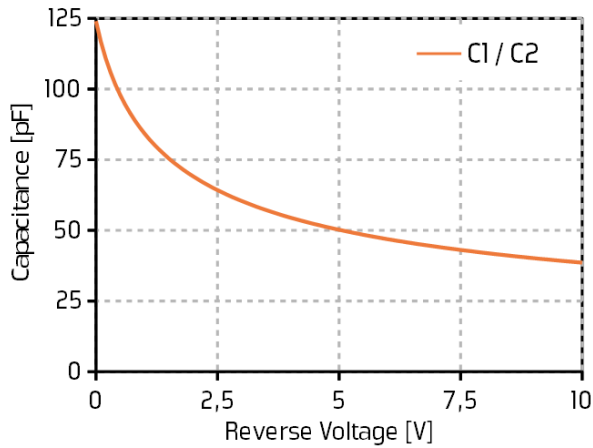
Symbol	Parameter	Conditions	Min	Typ	Max	Units
T_A	operating ambient temperature		-40		85	°C
$V_{r(A-C)}$	reverse voltage $V(A) - V(C)$				28	V
A_{PD}	active area (geometrical)	C1, C2 width height		1145 738		μm μm
		inactive area (pads) effective active area		0,064 0,781		mm^2 mm^2
I_d	dark current	C1, C2 $V_r = 10\text{V}$		10		μA
$\Delta I_d / \Delta T$	temperature coefficient of dark current	C1, C2 $V_r = 10\text{V}$		10		%/K
λ_{peak}	peak sensitivity wavelength	C1, C2 PR5001-ARC		800		nm
S_{peak}	peak sensitivity	C1, C2 PR5001-ARC		0,47		A/W
C_{j0}	zero-bias junction capacitance	C1, C2 $V_r = 0\text{V}$, $f = 1\text{MHz}$		125		pF
C_j	biased junction capacitance	C1, C2 $V_r = 10\text{V}$, $f = 1\text{MHz}$		38		pF

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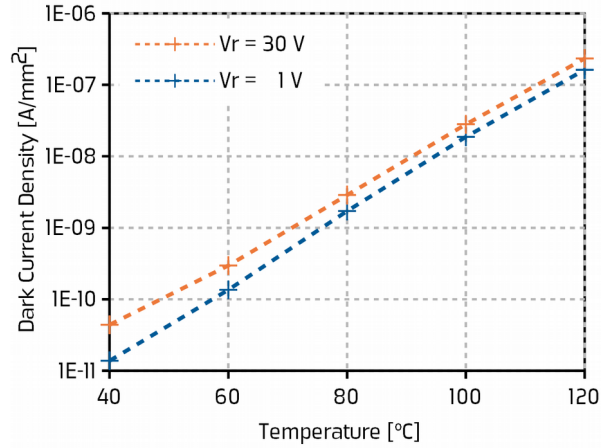


Electrical and Optical Characteristics

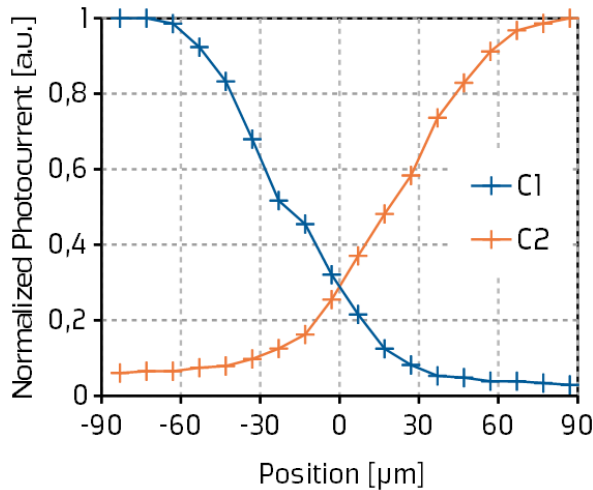
CAPACITANCE VS. REVERSE VOLTAGE



DARK CURRENT VS. TEMPERATURE



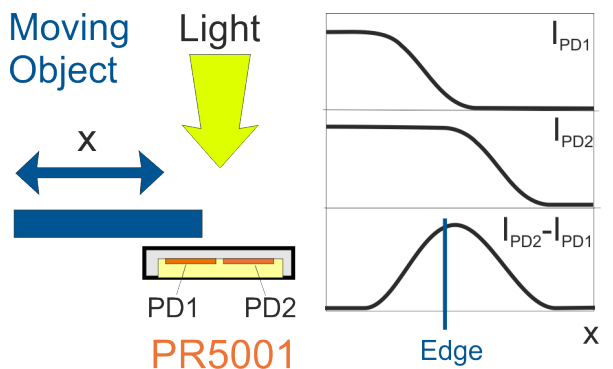
CHANNEL SEPARATION



The crosstalk between both photodiodes C1/C2 was measured with a wavelength of 660 nm. The crossover of a light spot with a diameter of 100 µm from one photodiode to the other has been resolved with increments of 10 µm. The photocurrent was measured with an applied reverse voltage of 4 V.

Considering a beam diameter of 100 µm and a gap between both photodiodes of 50 µm, the observed behaviour is consistent with almost sharp channel separation.

EDGE DETECTOR



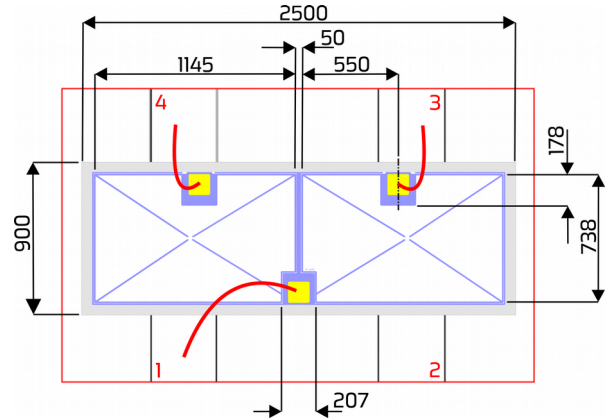
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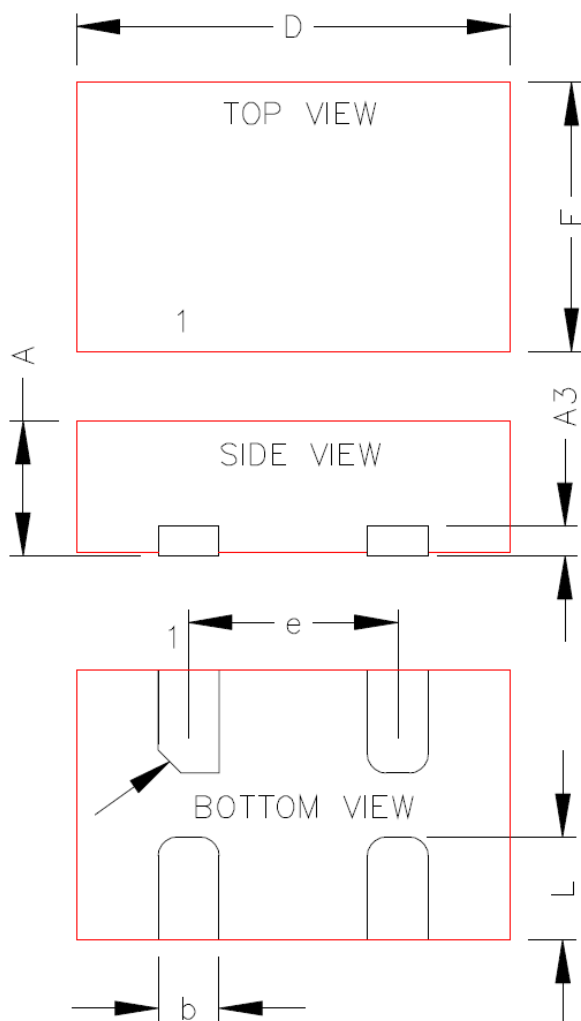
Package Information

LAYOUT AND PIN CONFIGURATION

Pin No.	Pin Name	PIN Function Description
1	A	Common Anode
2		Not connected
3	C2	Cathode photo diode 2
4	C1	Cathode photo diode 1



PACKAGE DIMENSIONS (ODFN)



	Min	Typ	Max	Unit
A	0,85	0,9	0,95	mm
A3		0,20 REF.		mm
b	0,35	0,4	0,45	mm
D	2,8	2,9	3	mm
E	1,7	1,8	1,9	mm
e		1,4 BSC*		mm
L	0,6	0,7	0,8	mm

* Basic Spacing Between Centers

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Package Information

SOLDERING INFORMATION

A lead-free solder profile with a peak temperature of 260°C or less, according to J-STD-020 should be followed.

Parts should be handled in accordance with the moisture sensitivity level as indicated on the moisture barrier bag, but at least to MSL 3.

Any parts without or with unsealed moisture barrier bag must be dry-baked according to JEDEC guidelines before soldering. Manual soldering must be done with utmost care.

Direct infrared heating should be avoided; pure convection heating is recommended.

TAPE & REEL

Reel diameter: 7" (178 mm)

Tape width: 8 mm

Quantity per reel: 3,000

Packaging: moisture barrier bag

Orientation of ICs in tape: Pins 3 and 4 towards sprocket holes

BARE DIES

PR5010 is available as bare dies on request on tested and sawn wafers or in wafflepack.

Please contact us for minimum order quantities and delivery times.

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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