

LA PD12083HP1

PIN Photodiode chip 120 x 83 mil



Light Avenue Premium Edition detector series is designed for high performance consumer applications. This chip is a high speed and high sensitive PIN photodiode chip with 5.5 mm² sensitive area and with a peak sensitivity at 970 nm. Anode and cathode are the bond pads on top.



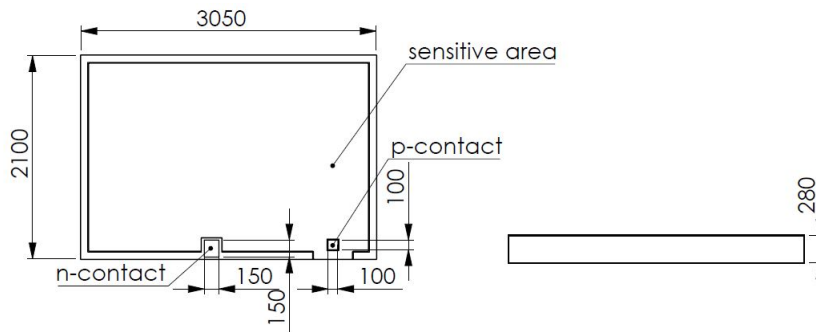
Features

- High sensitivity silicon PIN photodiode
- Anode and cathode on top

Applications

- Sensor
- Industrial electronics
- Data transmission
- Alarm and safety equipment
- High speed photodetector

Delineation



All dimensions in μm .

Mechanical characteristics

DESCRIPTION		MINIMUM	TYPICAL ¹	MAXIMUM
Chip size	(μm)	3000 x 2050	3050 x 2100	3100 x 2150
Chip height	(μm)	260	280	300
Sensitive area	(mm ²)		5.5	
Bond pad diameter Anode	(μm)	85 x 85	100 x 100	115 x 115
Bond pad diameter Cathode	(μm)	130 x 155	150 x 175	165 x 190
Top contact		Anode (p), AlSi / Cathode (n), AlSi		
Die attach		Epoxy bonding		

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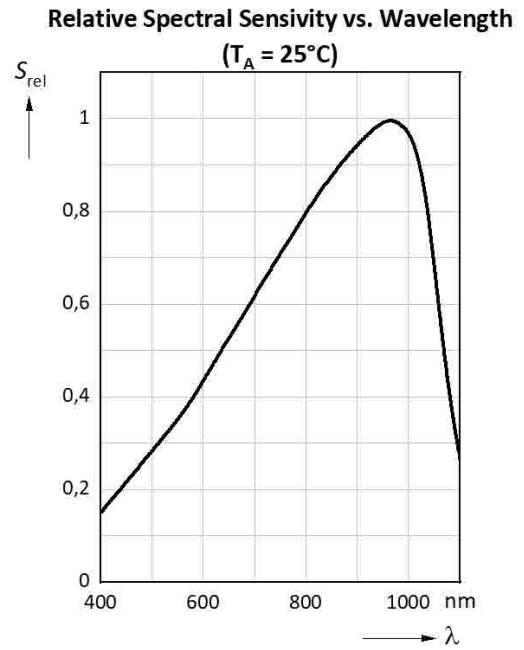
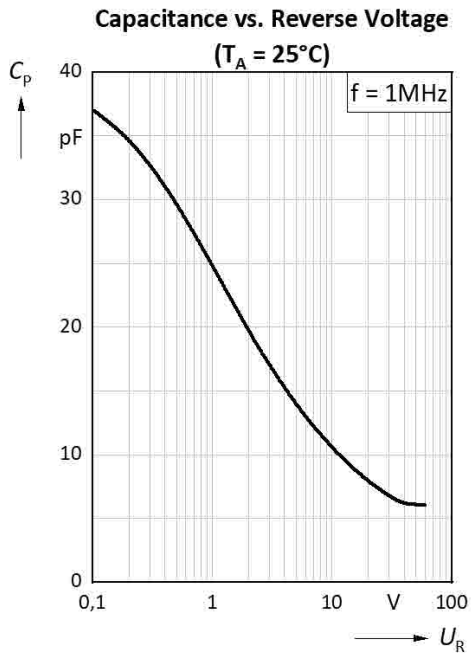
Electro-optical characteristics ($T_A = 25^\circ\text{C}$)²

PARAMETER	SYMBOL	CONDITION	MIN.	TYP. ¹	MAX.	UNIT
Breakdown voltage	V_{BR}	$I_R = 100 \mu\text{A}, E = 0$	60			V
Reverse dark current	I_{ro}	$V_R = 10 \text{V}, E = 0$		0.1	5	nA
Doide capacitance	C_D	$V_R = 0 \text{V}, f = 1 \text{MHz}, E = 0$		42		pF
Reverse light current	I_{ra}	$V_R = 5 \text{V}, \lambda = 890 \text{nm}, E_e = 1 \text{mW}/\text{cm}^2$		40		μA
Angle of half sensitivity	φ			± 60		°
Maximum sensitivity	λ_p			970		nm
Spectral bandwidth	$\lambda_{0.5}$		640		1070	nm
Rise time	t_r	$V_R = 5 \text{V}, R_L = 50 \Omega, \lambda = 870 \text{nm}$		130		ns
Fall time	t_r	$V_R = 5 \text{V}, R_L = 50 \Omega, \lambda = 870 \text{nm}$		130		ns

Maximum ratings ($T_A = 25^\circ\text{C}$)³

PARAMETER	SYMBOL	VALUE	UNIT
Reverse voltage	V_R	60	V
Junction temperature	T_j	100	°C
Operating temperature range	T_{op}	-40...100	°C
Storage temperature range	T_{st1}	-40...100	°C
Storage temperature range on foil	T_{st2}	-40...50	°C

Typical characteristics graphs



Handling and storage conditions

Storage time for wafers in sealed condition is not limited by the die itself, but may be limited by the adhesion of the blue foil (storage ambient conditions: $T_a = 15 \dots 30^\circ\text{C}$; relative humidity: $< 60\%$, vertical storage). Customer has to make sure that there is no glue from the adhesive foil on the backside either by a die shear test or by visual inspection of the backside before production. The hermetically sealed shipment lot shall be opened under temperature and moisture controlled cleanroom environment only. Customers have to follow the according rules for desposition as the material can be hazardous for humans and the environment. Chips are placed on a blue foil, which may contain the following substance in a concentration of circ.18% wt: Bis (2-ethyl(hexyl)phthalate) (DEHP) [CAS #: 117-81-7; EC # 204-211-0]. Dice have to be handled ESD sensitive.

Packing

Chips are placed on a blue foil inside a 6 inch ring or alternatively on a blue foil (mylar). For shipment the wafers of a shipment lot are arranged to stacks. Please use the recycling operators familiar to you. If required you can ask for our help. Please get in touch with your nearest sales office. By agreement we will take packing material back, if sorted. Transport costs of any kind must be paid by customers. For packing material that is returned to us unsorted or which we are not obliged to accept, any costs incurred will be invoiced to you.

Design objectives

The chip design was developed and released based on the producer's standard assembly procedures and packaging. Bond strength properties are in accordance to MIL-STD-750D, method 2037. Whether the chip fits to the customer's products with its according die and wire bond procedures and packaging must be evaluated by the customer himself. If workability problems arise after this release a mutually conducted problem solving procedure has to be set up, if the chips are suspected of contributing to the problems. The chips are produced with best effort, but on chip level a subset of the chip characteristics can be determined only. Performance of the chip in the customer's products can only be determined by the customer himself.

Returns and complaints

For complaints and returns of material a RMA-number is necessary. Samples for analysis purposes can be send to us without credit.

Shipping conditions

If not otherwise arranged, the "General Terms of Business of Light Avenue GmbH" apply for any shipment. If this document is not familiar to you, please request it at our nearest sales office.

Disclaimer

Attention please!

- **Components used in life-support devices or systems must be expressly authorized for such purpose!**

Critical components⁴ may only be used in life-support devices⁵ or systems with the express written approval by us.

- All products, product specifications and data to improve reliability, function, design or otherwise are subject to change without notice .
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- The information describes the type of component and shall not be considered as assured characteristics. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.
- Lead free product - RoHS compliant.
- The quality level of the final visual inspection shall comply to an AQL of 1.0 (according to MIL-STD-105E, level II), if the customer performs an incoming visual inspection of a shipment.

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- All chips are checked according to the producer's specification of the visual inspection. If this document is not familiar to you, please request it at our nearest sales office.

Changes

VERSION	DATE	CONTENT
1.0	21.01.2023	Change management has started, technical graphs have been added.

Published by:
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¹Due to the special conditions of the manufacturing processes of LED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.

²Measurements are done with an accuracy of $\pm 15\%$. Correlation to customer's equipment and products is required.

³Maximum ratings are package dependent and may differ between packages. The forward current is not limited by the die but by the effect of the LED junction temperature on the package. If you need more information on pulsed operation, please contact your next sales office about possible driving conditions. If not otherwise specified the maximum pulse current may not exceed the maximum current in continuous mode.

⁴A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or the effectiveness of that device or system.

⁵Life support devices or systems are intended(a) to be implanted in the human body, or(b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health and the life of the user may be endangered.