# LA PD120BP1

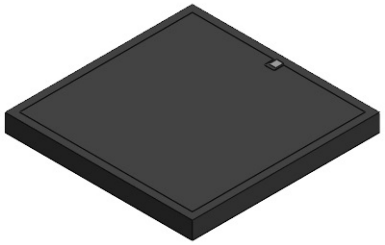
Premium Edition Blue enhanced PIN photodiode 120 mil

LIGHT AVENUE
A Brand of Chips 4 Light GmbH

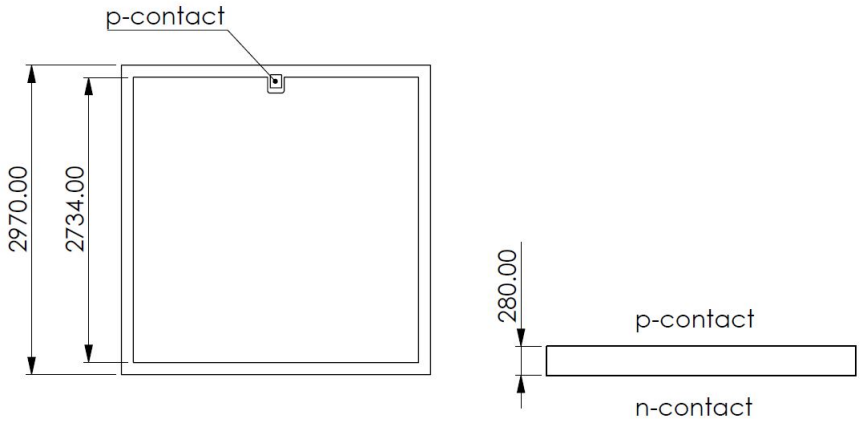
Light Avenue Premium Edition detector series is designed for high performance consumer applications. This chip is a high sensitive PIN photodiode chip with 7.7 $mm^2$ sensitive area detecting blue enhanced visible and near infrared radiation with a peak sensitivity at 940 nm. Anode is the bond pad on top of the chip.

## Features

- High sensitivity silicon PIN photodiode
- Radiant sensitive area: 7.7 $mm^2$
- Suitable for visible and IR radiation
- Blue enhanced sensitivity



## Delineation




## Mechanical characteristics

| DESCRIPTION | | MINIMUM | TYPICAL[1] | MAXIMUM |
|---|---|---|---|---|
| Chip size | (µm) | 2870 | 2970 | 3070 |
| Chip height | (µm) | 250 | 280 | 310 |
| Bond pad diameter | (µm) | 90 | 120 | 140 |
| Top contact | | Anode (p), aluminum | | |
| Bottom contact | | Cathode (n), NiV | | |
| Die attach | | Epoxy bonding | | |



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## Electro-optical characteristics ($T_A = 25°C$)[2]

| PARAMETER | SYMBOL | CONDITION | MIN. | TYP.[1] | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Forward voltage | $V_F$ | $I_F = 50\,mA$ | | 1.0 | 1.3 | V |
| Breakdown voltage | $V_{BR}$ | $I_R = 100\,\mu A$<br>$E_e = 0\,mW/cm^2$ | 25 | | | V |
| Reverse dark current | $I_{r0}$ | $V_R = 10\,V$<br>$E_e = 0\,mW/cm^2$ | | 2 | 5 | nA |
| Junction capacitance | $C_D$ | $V_R = 3\,V$<br>$E_e = 0\,mW/cm^2$<br>$f = 1\,MHz$ | | 30 | | pF |
| Junction capacitance | $C_D$ | $V_R = 0\,V$<br>$E_e = 0\,mW/cm^2$<br>$f = 1\,MHz$ | | 90 | | pF |
| Reverse light current | $I_{ra}$ | $V_R = 5\,V$<br>$\lambda = 400\,nm$<br>$E_e = 1\,mW/cm^2$ | | 13 | | µA |
| Maximum sensitivity | $\lambda_p$ | | | 940 | | nm |
| Spectral bandwidth | $\lambda_{0.1}$ | | | 350 ... 1100 | | nm |
| Rise and fall time | $t_r, t_f$ | $V_R = 5\,V$<br>$\lambda = 850\,nm$<br>$R_L = 500\,\Omega$ | | 50 | | ns |

## Maximum ratings ($T_A = 25°C$)[3]

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| Operating temperature range | $T_{op}$ | -40...100 | °C |
| Junction temperature | $T_j$ | 100 | °C |




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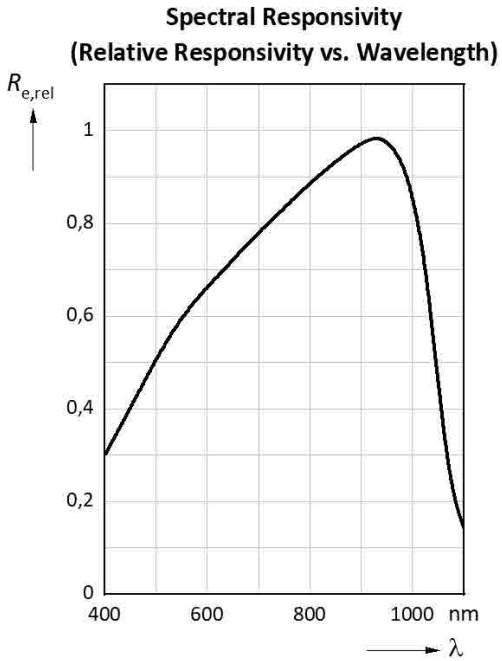
## Typical characteristics graphs





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### 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: $T_a = 15 \ldots 30°C$; relative humidity: < 60%, vertical storage). Therefore we ship the dice without any limitation of shelf life. 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. 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) only. 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.

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[1]Due to the special conditions of the manufacturing processes of detectors, 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.

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

[3]Maximum ratings are package dependent and may differ from package to package.

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