

LA PT20HP1

Phototransistor 20 mil



Light Avenue Premium Edition detector series is designed for high performance consumer applications. This device is a silicon NPN phototransistor chip with high radiant sensitivity. It is sensitive to visible and near infrared light. Emitter and base is on top of the chip.

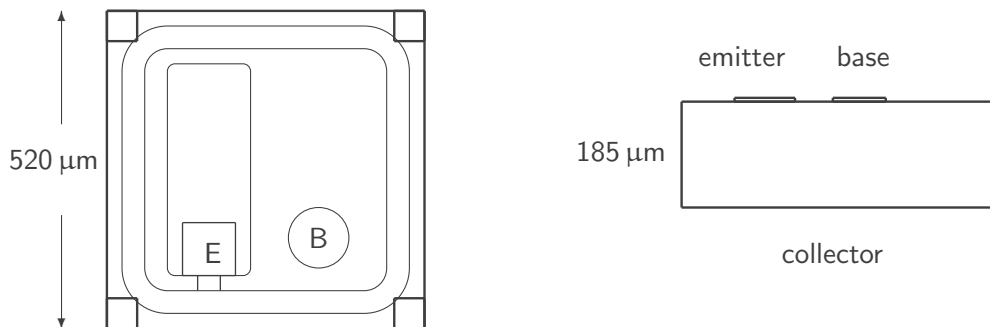
Features

- High sensitivity silicon NPN phototransistor
- Suitable for visible and IR radiation
- Radiant sensitive area: 0.14mm^2

Applications

- Electronic controls
- Sensors

Delineation



Mechanical characteristics

| DESCRIPTION | MINIMUM | TYPICAL ¹ | MAXIMUM |
|-----------------------------------|---------------------|----------------------|---------|
| Chip length | (μm) | 520 | |
| Chip height | (μm) | 185 | |
| Bond pad emitter | (μm^2) | 100 x 100 | |
| Diameter bond pad base | (μm) | 100 | |
| Frontside contacts, base, emitter | Al | | |
| Backside contact, collector | AuSb | | |
| Die attach | Epoxy bonding | | |

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

| PARAMETER | SYMBOL | CONDITION | MIN. | TYP. ¹ | MAX. | UNIT |
|-------------------------------------|-----------------|---|------|-------------------|------|---------------|
| Collector emitter breakdown voltage | $V_{(BR),CEO}$ | $I_C = 1 \text{ mA}$ | 70 | | | V |
| Collector dark current | I_{CE0} | $V_{CE} = 20 \text{ V}, E = 0$ | | 1 | | nA |
| Collector light current | I_{ca} | $E_e = 1 \text{ mW/cm}^2$ $V_{CE} = 5 \text{ V}, \lambda = 950 \text{ nm}$ | 0.43 | | 0.77 | mA |
| Wavelength of peak sensitivity | λ_p | | | 825 | | nm |
| Range of spectral bandwidth | $\lambda_{0.1}$ | | | 440 - 1070 | | nm |
| Rise time | t_r | $V_{CE} = 5 \text{ V}, I_C = 2 \text{ mA},$ $R_L = 100 \Omega$ | | 4.3 | | μs |
| Fall time | t_f | $V_{CE} = 5 \text{ V}, I_C = 2 \text{ mA},$ $R_L = 100 \Omega$ | | 7.7 | | μs |

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

| PARAMETER | SYMBOL | VALUE | UNIT |
|-------------------------------|-----------|------------|------------------|
| Collector emitter voltage | V_{CE0} | 70 | V |
| Emitter collector voltage | V_{EC0} | 5 | V |
| Collector current | I_C | 50 | mA |
| Operating temperature range | T_{op} | -40...+100 | $^\circ\text{C}$ |
| Storage temperature range | T_{st} | -40...+100 | $^\circ\text{C}$ |
| Detector junction temperature | T_j | 100 | $^\circ\text{C}$ |

Notes:

- The measurements are based on samples of die which are mounted on a TO-header without resin coating
- The usage of detectors in life-support devices or systems has to be expressly and written authorized by the supplier!
- Dice are shipped on blue foil with or without frame and have therefore to be stored between 15 and 30 $^\circ\text{C}$ and below 60% relative humidity.
- Lead free product - RoHS compliant.
- The information in this document is subject to change without notice and describes the die generally. It shall not be considered as assured characteristics or detailed specification.
- 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.

- All chips are checked according to the "Failure Catalog of Light Avenue dice" dated 2009-11-14. The visual inspection shall be made in accordance with the "specification of visual inspection as referenced". The visual inspection of chip backside is performed with stereo microscope with incident light and 40x to 80x magnification. The quality inspection (final visual inspection) is performed by production. An additional visual inspection step as special release procedure by QM is not installed. If this document is not familiar to you, please request it at your next sales office.
- The hermetically sealed shipment lots shall be opened in temperature and moisture controlled cleanroom environment only. It is mandatory to follow the rules for disposition of material that can be hazardous for humans and environment.
- Product must be handled only at ESD safe workstations. Standard ESD precautions and safe work environments are as defined in MIL-HDBK-263.
- Singulated die are not to be handled with tweezers. A vacuum wand with non metallic ESD protected tip should be used.

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¹Typical (Typ) data are defined as long-term production mean values. These values are not specified and only given for information.

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.