

3mm Round Standard T-1 With Flange Type  
Silicon PIN Photodiode  
Technical Data Sheet

Part No.: LL-304PDD2E



**Features:**

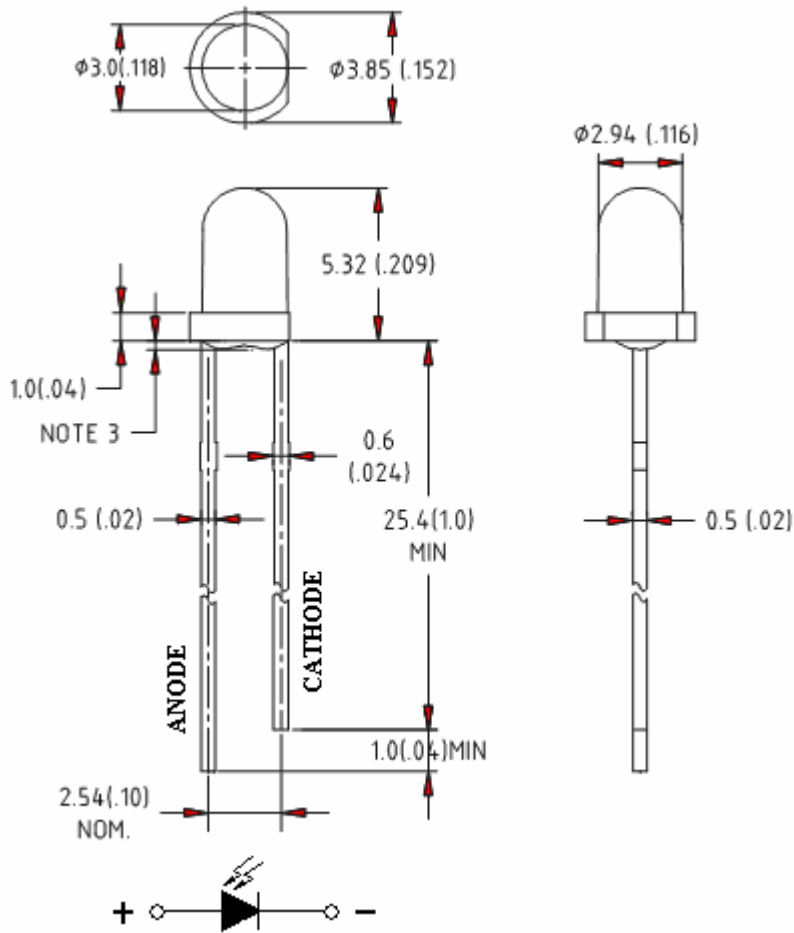
- ◇ Fast response time.
- ◇ High photo sensitivity.
- ◇ Small junction capacitance.
- ◇ The product itself will remain within RoHS compliant Version.

**Descriptions:**

- ◇ The LL-304PDD2E is a high speed and high sensitive PIN photodiode in a standard  $\phi 3$  epoxy package. Due to its water clear epoxy the device is sensitive to visible and infrared radiation.

**Applications:**

- ◇ High speed photo detector.
- ◇ Automatic door sensor.
- ◇ Security system.
- ◇ Game machine.
- ◇ Camera.

**Package Dimension:**


| Part No.    | Chip Material | Lens Color | Source Color      |
|-------------|---------------|------------|-------------------|
| LL-304PDD2E | Silicon       | Black      | Infrared Receiver |

**Notes:**

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25$  mm (.010") unless otherwise noted.
3. Protruded resin is 1.00 mm (.039") max.
4. Specifications are subject to change without notice.

**Absolute Maximum Ratings at Ta=25°C**

| Parameters  | Symbol | Max.           | Unit |
|---|--------|----------------|------|
| Power Dissipation                                     | PD     | 150            | mW   |
| Reverse Voltage                                       | VR     | 32             | V    |
| Operating Temperature Range                           | Topr   | -25°C to +80°C |      |
| Storage Temperature Range                             | Tstg   | -40°C to +85°C |      |
| Lead Soldering Temperature<br>[4mm (.157") From Body] | Tsld   | 260°C          |      |

**Electrical Optical Characteristics at Ta=25°C**

| Parameters                     | Symbol          | Min. | Typ. | Max. | Unit | Test Condition   |
|--------------------------------|-----------------|------|------|------|------|--|
| Rang of Spectral Bandwidth     | $\lambda_{0.5}$ | 840  | ---  | 1100 | nm   |  |
| Wavelength of Peak Sensitivity | $\lambda_p$     | ---  | 940  | ---  | nm   |  |
| Open-Circuit Voltage           | V <sub>OC</sub> | ---  | 0.42 | ---  | V    | Ee=5mW/cm <sup>2</sup><br>$\lambda_p=940\text{nm}$                           |
| Short-Circuit Current          | I <sub>SC</sub> | ---  | 30   | ---  | μA   | Ee=1mW/cm <sup>2</sup> ,<br>$\lambda_p=940\text{nm}$ ,<br>V <sub>R</sub> =5V |
| Reverse Light Current          | I <sub>L</sub>  | 1.0  | 3.0  | ---  |      |  |
| Dark Current                   | I <sub>D</sub>  | ---  | ---  | 10   | nA   | Ee=0mW/cm <sup>2</sup> ,<br>V <sub>R</sub> =10V                              |
| Reverse Breakdown              | BV <sub>R</sub> | 32   | 170  | ---  | V    | Ee=0mW/cm <sup>2</sup> ,<br>I <sub>R</sub> =100μA                            |
| Total Capacitance              | C <sub>t</sub>  | ---  | 5    | ---  | pF   | Ee=0mW/cm <sup>2</sup> ,<br>f=1MHZ,<br>V <sub>R</sub> =5V                    |
| Rise Time (10% TO 90%)         | T <sub>r</sub>  | ---  | 6    | ---  | ns   | R <sub>L</sub> =100Ω,<br>V <sub>R</sub> =10V                                 |
| Fall Time (90% TO 10%)         | T <sub>f</sub>  | ---  | 6    | ---  |      |  |

**Notes:**

1.  $\theta_{1/2}$  is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

**Typical Electrical / Optical Characteristics Curves**  
 (25°C Ambient Temperature Unless Otherwise Noted)

Fig.1 Power Dissipation vs. Ambient Temperature

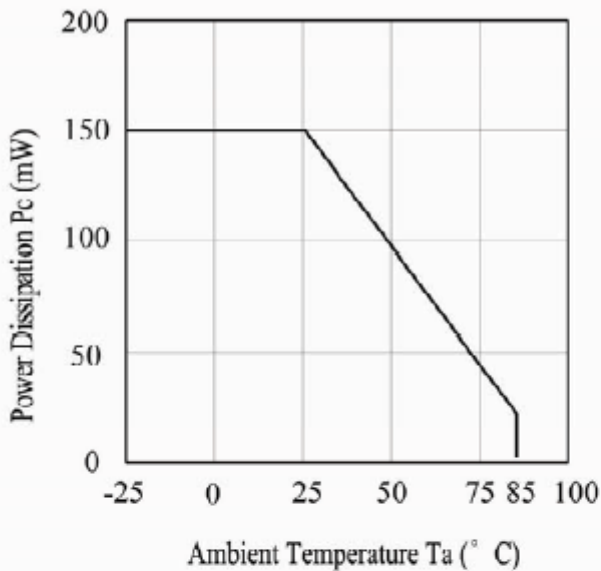


Fig.2 Spectral Sensitivity

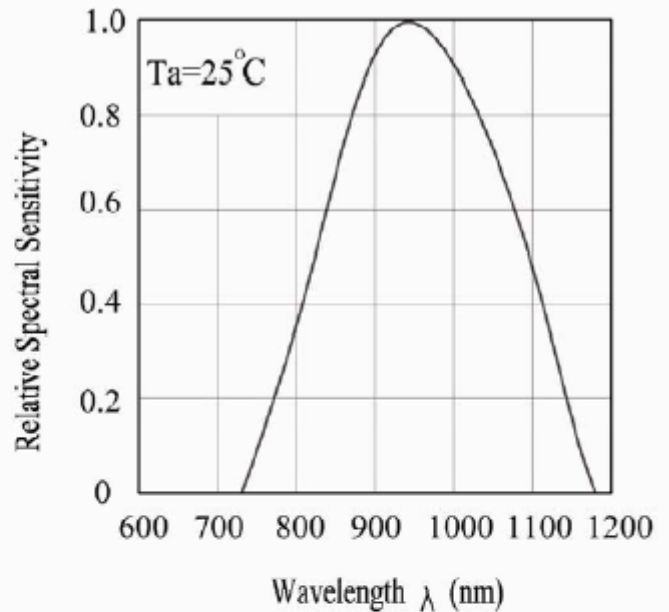


Fig.3 Dark Current vs. Ambient Temperature

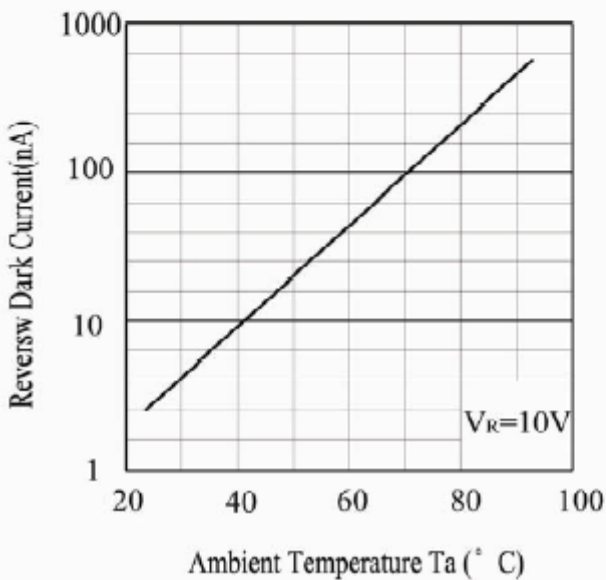


Fig. 4 Reverse Light Current vs.  $E_e$

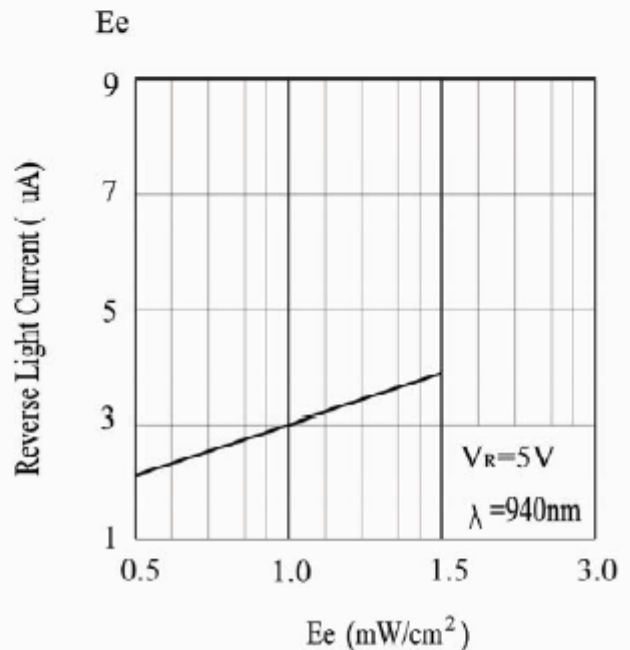




Fig.5 Terminal Capacitance vs. Reverse Voltage

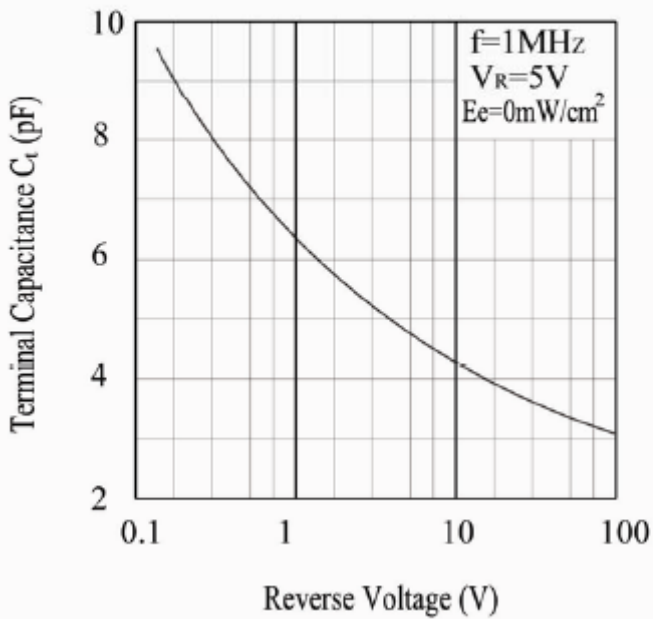
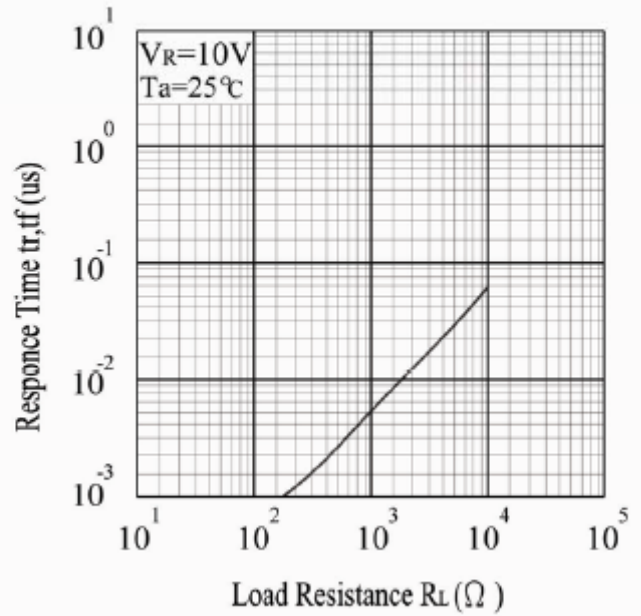


Fig.6 Response Time vs. Load Resistance



**Please read the following notes before using the datasheets:**

**1. Over-current-proof**

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

**2. Storage**

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package, the LEDs should be kept at 30°C or less and 90%RH or less.

2.3 The LEDs should be used within a year.

2.4 After opening the package, the LEDs should be kept at 30°C or less and 70%RH or less.

2.5 The LEDs should be used within 168 hours (7 days) after opening the package.

**3. Soldering Condition**

3.1 Pb-free solder temperature profile.

3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the LEDs during heating.

3.4 After soldering, do not warp the circuit board.

**4. Soldering Iron**

Each terminal is to go to the tip of soldering iron temperature less than 260°C for 5 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

**5. Repairing**

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

**6. Caution in ESD**

Static Electricity and surge damages the LED. It is recommended to use a wrist band or anti-electrostatic glove when handling the LED. All devices equipment and machinery must be properly grounded.