

## Datasheet of 25Gb/s 1310nm PIN Photodiode Chip

### Description

The PIN PD is a top-illuminated 25G InGaAs PIN photodiode, which is designed for high-speed 1310nm-1550nm uncooled digital applications, including 25G/100G Telecom and Datacom applications.

### Absolute Maximum Ratings

| Parameter             | Symbol   | Value       | Unit | Condition                         |
|-----------------------|----------|-------------|------|-----------------------------------|
| Reverse Voltage       | $V_R$    | 20          | V    |                                   |
| Forward Current       | $I_f$    | 10          | mA   |                                   |
| Optivcal Input Power  | $P_{in}$ | 10          | dBm  |                                   |
| Operating Temperature | $T_{op}$ | -40 to 90   | C    | In $N_2$ environment or in vacuum |
| Storage Temperature   | $T_{st}$ | -55 to +125 | C    |                                   |

### Electrical and Optical Characterizations: (T=25C unless otherwise noted)

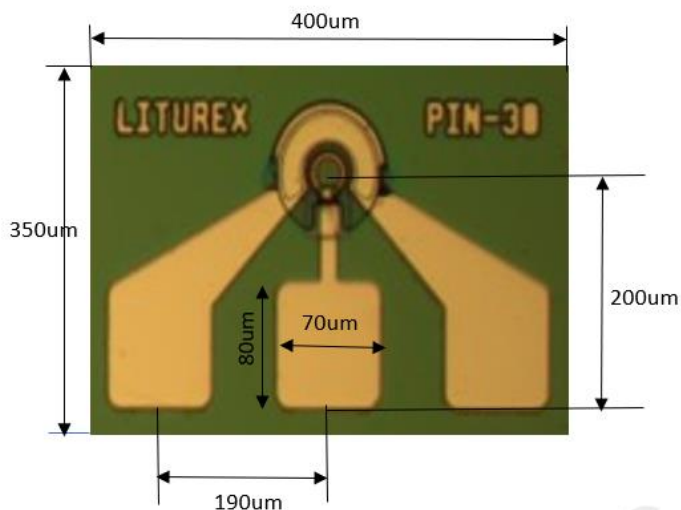
| Parameter            | Symbol        | Min. | Typ. | Max. | Unit    | Condition                                                           |
|----------------------|---------------|------|------|------|---------|---------------------------------------------------------------------|
| Active Area Diameter | $\phi$        |      | 20   |      | $\mu m$ |                                                                     |
| Operation Voltage    | $V_R$         | 1.5  | 2    |      | V       |                                                                     |
| Responsivity         | $\mathcal{R}$ | 0.8  |      |      | A/W     | $\lambda=1310nm$                                                    |
| Dark Current         | $I_D$         |      | 5    | 20   | nA      | $V_R=5V$ , 25C, EOL                                                 |
|                      |               |      |      | 500  | nA      | $V_R=5V$ , 85C, EOL                                                 |
| Capacitance          | C             | 50   |      | 100  | fF      | $V_R=2V$ , f=1MHz                                                   |
| Breakdown Voltage    | $V_{BD}$      | 30   |      |      | V       | $I_R=10uA$ , 25C                                                    |
| Reflectivity         | R             |      |      | 2    | %       | $\lambda=1260-1480nm$                                               |
| 3dB Bandwidth        | BW            | 20   |      |      | GHz     | $V_R=2V$ , $R_L=50\text{ Ohm}$ , $\lambda=1310nm$ , $P_{in}= -3dBm$ |

### Reliability Specification

- End of Life Criteria:  $I_d > 2\mu A$  at  $V_R = -5V$ , 90C
- Reliability Requirement: >20 years lifetime at 55C operation
- Reliability Test Form Factor: TO-Can
- Product Qualification:
  - 3 wafers from 3 different process runs, SS=30/wafer for each test
  - HTOL: -5V, 90C, 5000 hours
  - THB: 85C/85%RH, -5V, 500 hours

- THS: 85C/85%RH, no bias, 500 hours
- Wafer Qual:
  - HTOL: -5V, 90C, 100 hours, SS=30
  - THS: 85C/85%RH, no bias, 24 hours, SS=20
- ESD Threshold: HBM, CDM, MM (to be measured)

## Geometric Dimensions



| Parameter         | Dimensions       |
|-------------------|------------------|
| Die Length        | 400um+/-20um     |
| Die Width         | 350um+/-20um     |
| Die Thickness     | 150um+/-10um     |
| Aperture Diameter | 20um             |
| Anode Pad Size    | 80*70um          |
| Cathode Pad Size  | 80*70um          |
| Street width      | 40um, die to die |

## Revision Info

| Rev | Date       | Description     | Originator   |
|-----|------------|-----------------|--------------|
| 1.0 | 2020-02-28 | Initial Release | Patrick Chen |
| 2.0 | 2020-09-03 | Update geometry | Hanxing Shi  |
|     |            |                 |              |