

# Vertical Cavity Surface Emitting Laser in TO-46 Package

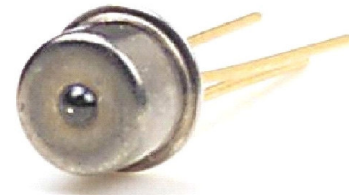


## OPV314, OPV314Y

## Technical Data

### Features

- 850nm VCSEL Technology
- Data rates up to 2.5 Gbps
- High thermal stability
- Low drive current/high output density
- Narrow and concentric beam angle
- Recommended for multimode fiber applications
- TO-46 package with microbead lens
- Burned in for communication level reliability
- Monitor photodiode



### Description

The OPV314 is a high performance 850nm VCSEL packaged for high speed communication links. OPV314 combines all the performance advantages of a VCSEL with the addition of a power monitor diode for precise control of optical power.

The OPV314Y is identical electrically and optically and differs only in pin out. Refer to mechanical drawings for details.

Features including high speed, high output power and concentric beam makes it an ideal transmitter for integration into all types of data communications equipment.

Applications include:

- ◆ Fibre Channel
- ◆ Gigabit Ethernet
- ◆ ATM
- ◆ VSR
- ◆ Intra-system links
- ◆ Optical backplane interconnects.

### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

|                                       |                      |
|---------------------------------------|----------------------|
| Storage Temperature                   | -40°C to +100°C      |
| Operating Temperature                 | 0°C to +70°C         |
| Soldering Lead Temperature            | 260°C for 10 Seconds |
| Maximum Forward Peak Current          | 20 mA                |
| Maximum Reverse Voltage               | 10 V                 |
| Max. Continuous Optical Power at 70°C | 1.1 mW               |



Additional laser safety information can be found on the Optek website. See application #221. Classification is not marked on the device due to space limitations. See package outline for centerline of optical radiance. Operating devices beyond maximum rating may cause devices to exceed rated classification

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# OPV314, OPV314Y Technical Data



## Electrical/Optical Characteristics (at 25 °C unless otherwise specified)

| SYMBOL                   | PARAMETER                              | MIN  | TYP       | MAX  | UNITS | TEST CONDITION                   |
|--------------------------|--|------|-----------|------|-------|----------------------------------|
| $P_{OT}$                 | Total Power Out                        | 1.40 |           |      | mW    | $I_F = 7 \text{ mA}$             |
| $I_{TH}$                 | Threshold Current                      | 0.80 |           | 3.00 | mA    | Note 1                           |
| $V_F$                    | Forward Voltage                        | 1.60 |           | 2.20 | V     | $I_F = 7 \text{ mA}$             |
| $I_R$                    | Reverse Current                        |      |           | 35   | nA    | $V_R = 5 \text{ V}$              |
| $R_S$                    | Series Resistance                      | 20   |           | 55   | ohms  | Note 2                           |
| $\eta$                   | Slope Efficiency                       | 0.28 |           | 0.60 | mW/mA | Note 3                           |
|                          | Linearity                              | 0.00 |           |      |       | Note 4                           |
| $\lambda$                | Wavelength                             | 840  | 850       | 860  | nm    |                                  |
| $\Delta\lambda$          | Optical Bandwidth                      |      |           | 0.85 | nm    |                                  |
| $t_r/t_f$                | Rise and Fall Time                     |      | 100       |      | ps    | 20% to 80%                       |
| $N_{RI}$                 | Relative Intensity Noise               |      | -123      |      | db/Hz |                                  |
| $\Delta I_{TH}/\Delta T$ | Temp Coefficient of Threshold Current  |      | $\pm 1.0$ |      | mA    | 0° - 70° C, Note 1               |
| $\Delta\lambda/\Delta T$ | Temp Coefficient of Wavelength         |      | 0.06      |      | %/°C  | 0° - 70° C, $I_F = 7 \text{ mA}$ |
| $\Delta V_F/\Delta T$    | Temperature Coefficient for VF         |      | -2.5      |      | mV/°C | 0° - 70° C, $I_F = 7 \text{ mA}$ |
| $\Delta\eta/\Delta T$    | Temperature Coefficient for Efficiency |      | -0.5      |      | %/C   | 0° - 70° C, Note 3               |

## Photodiode Electrical Characteristics (at 25 °C unless otherwise specified)

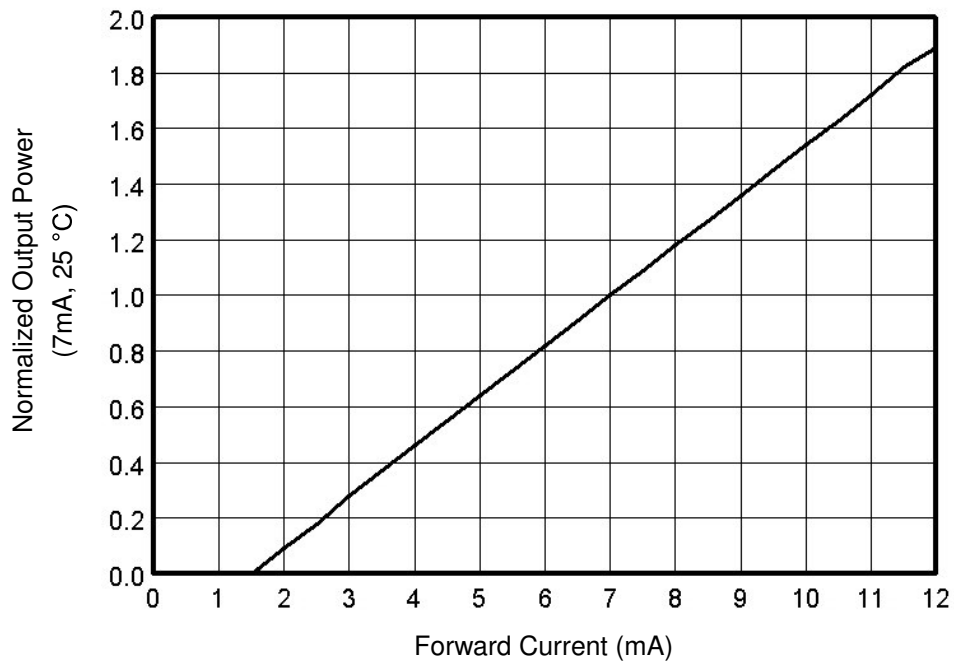
| SYMBOL    | PARAMETER                    | MIN | TYP | MAX | UNITS         | TEST CONDITION                             |
|-----------|------------------------------|-----|-----|-----|---------------|--|
| $I_{RPD}$ | Reverse Current, photo diode |     |     | 30  | nA            | $V_R = 5 \text{ V}$                        |
| $I_{M1}$  | Monitor Current              | 40  |     |     | $\mu\text{A}$ | $I_F = 7 \text{ mA}$ , $V_R = 5 \text{ V}$ |
| $I_{M2}$  | Monitor Current              | 45  |     |     | $\mu\text{A}$ | $P_O = 2 \text{ mW}$ , $V_R = 5 \text{ V}$ |

### NOTES:

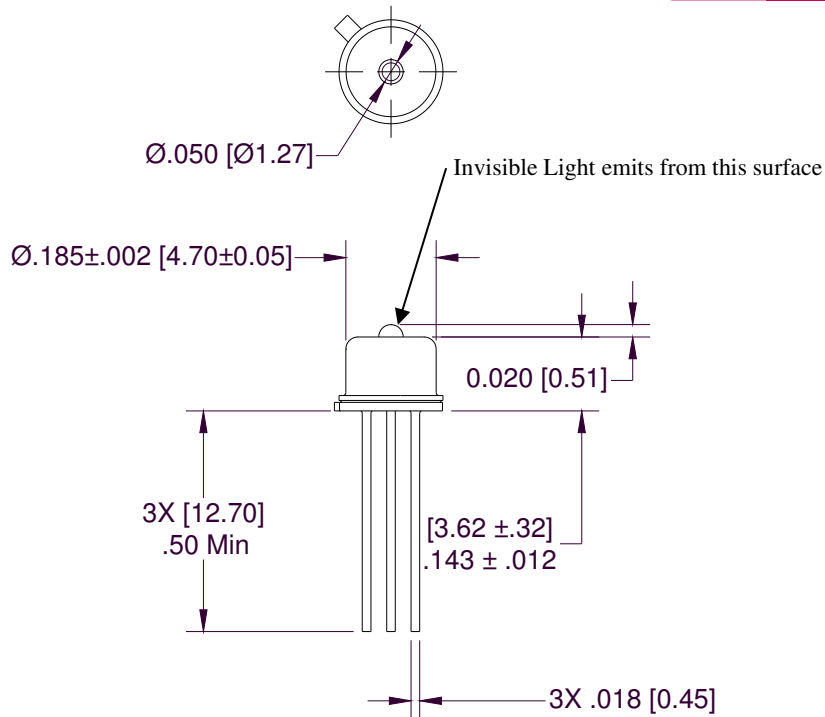
- (1) Threshold Current is based on the two line intersection method specified in Telcordia GR-468-Core. Line 1 from 4 mA to 6 mA. Line 2 from 0 mA to 0.5 mA.
- (2) Series Resistance is the slope of the Voltage-Current line from 5 to 8 mA.
- (3) Slope efficiency, is the slope of the best fit LI line from 5 mA to 8 mA using no larger than .25 mA test interval points.
- (4) Using data points taken for slope efficiency above,  $\Delta L/\Delta I$  shall be calculated for each adjacent pair of points.



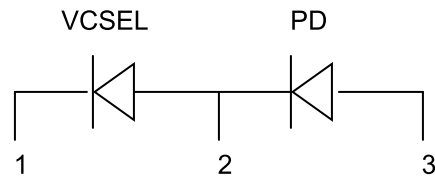
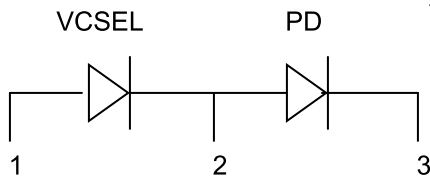
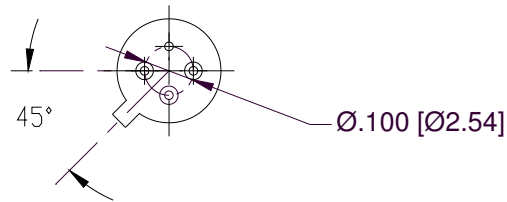
### Normalized Output Power vs. Forward Current



# OPV314, OPV314Y Technical Data



- 1) Tolerances are  $\pm 0.005$  unless otherwise specified
- 2) Dimensions in inches [mm]



| OPV314 |                        |
|--------|------------------------|
| Pin    | Connection             |
| 1      | VCSEL Anode            |
| 2      | VCSEL Cathode/PD Anode |
| 3      | PD Cathode             |

| OPV314Y |                        |
|---------|------------------------|
| Pin     | Connection             |
| 1       | VCSEL Cathode          |
| 2       | VCSEL Anode/PD Cathode |
| 3       | PD Anode               |