Vertical Cavity Surface Emitting Laser

OPV300, OPV310, OPV310Y, OPV314, OPV314Y



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
- Burned in for communication level reliability

Description:

The **OPV300 / OPV310 / OPV314** series are high performance 850nm Vertical Cavity Surface Emitting Laser (VCSEL). The **OPV300** and **OPV310** are designed to be utilized for sensing applications as well as air transmission of data. The **OPV314** is designed for high speed communication links. The **OPV310 / OPV314** combine all the performance advantages of a VCSEL with the addition of a power monitor diode for precise control of optical power. The **OPV310 and OPV314** have a back monitor photodiode used for optical power management or optical reception for data communication applications.

The **OPV300 / OPV310** have a flat lens while the **OPV314** has a microbead lens. Refer to mechanical drawings for details.

The high performance 850nm VCSEL is designed for applications where low current is required with high onaxis optical power. These product's combine features including high speed, high output optical power and concentric beam making it an ideal transmitter for integration into all types of data communications equipment as well as for reflective and transmissive switches.

Applications:

- Fiber Channel
- Gigabit Ethernet
- ATM
- VSR
- Intra-System links
- Optical backplane
 interconnects
- Reflective sensing
- Interruptive sensing
- Long distance spot illumination

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Operating Temperature Range	0°C to +70°C
Storage Temperature Range	-40°C to +100°C
Maximum Forward Peak Current, continuous	12 mA
Maximum Reverse Voltage	5 V
Max. Continuous Optical Power at 70° C	1.1 mW
Lead Soldering Temperature	260°C for 10 sec.
Maximum Forward Current, pulsed (1 µs P.W., 10% D.C.)	48 mA

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.





Additional laser safety information can be found on the Optek website. See application bulletin #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 result in hazardous radiation exposure.



Symbol Parameter Max Units **Test Conditions** Min Тур Total Power Out OPV300 / OPB310 1.50 Pot mW $I_F = 7 \text{ mA}$ **OPV314** 1.40 Threshold Current 0.80 3.00 mΑ Note 1 ITH Forward Voltage 1.60 2.20 V $I_F = 7 \text{ mA}$ V_{F} **Reverse Current** 100 $V_R = 5 V$ nA I_R Series Resistance Note 2 Rs 20 55 ohms Slope Efficiency 0.28 0.60 mW/mA Note 3 ŋ 0.00 Linearity Note 4 Wavelength 840 850 860 λ nm Δλ Optical Bandwidth 0.85 nm Beam Divergence (OPV300 / OPV310 only) $I_F = 7 \text{ mA}$, FWHM θ 24 Degree **Rise and Fall Time** 100 20% to 80% t_r/t_f ps N_{RI} **Relative Intensity Noise** -123 dB/Hz Temp Variance of Threshold Current ±1.0 0° - 70° C, Note 1 ΔI_{TH} mΑ Temp Coefficient of Wavelength $0^{\circ} - 70^{\circ} \text{ C}, I_{\text{F}} = 7 \text{ mA}$ 0.06 %/°C $\Delta \lambda / \Delta T$ Temperature Coefficient for VF -2.5 $0^{\circ} - 70^{\circ} \text{ C}, \text{ I}_{\text{F}} = 7 \text{ mA}$ $\Delta V_F \Delta T$ mV/°C 0° - 70° C, Note 3 Temperature Coefficient for Efficiency -0.5 %/°C $\Delta \eta / \Delta T$ Photodiode Electrical Characteristics (OPV310/OPV314 series) V_R = 5 V Reverse Current, photodiode 30 IRPD nA Monitor Current **OPV310** 30 $I_{F} = 7 \text{ mA}, V_{R} = 5 \text{ V}$ uА I_{M1} **OPV314** 40 40 $P_0 = 2 \text{ mW}, V_R = 5 \text{ V}$ Monitor Current **OPV310** uА I_{M2} **OPV314** 45

Electrical/Optical Characteristics (T_A = 25°C unless otherwise noted)

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.

(5) ESD Class 1

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VCSEL Cathode/PD Anode

PD Cathode

OPTEK Technology Inc.— 1645 Wallace Drive, Carrollton, Texas 75006

VCSEL Cathode

No Connection

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VCSEL Anode/PD Cathode

PD Anode

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