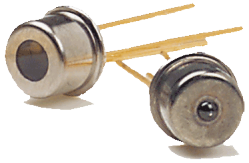
Vertical Cavity Surface Emitting Laser

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 on-axis 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

RoHS

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 center-line of optical radiance. Operating devices beyond maximum rating may result in hazardous radiation exposure.

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Electrical Specifications

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

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 center-line of optical radiance. Operating devices beyond maximum rating may result in hazardous radiation exposure.

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Electrical Specifications

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

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

(5) ESD Class 1

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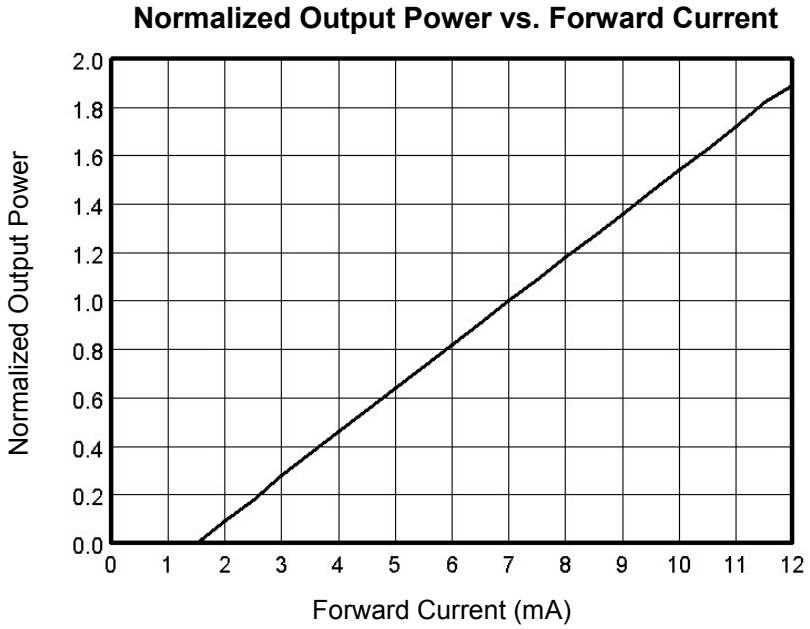
Performance



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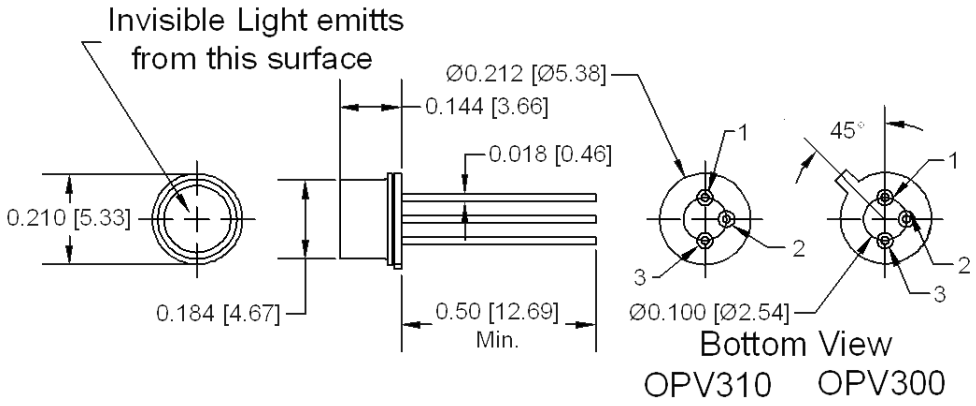
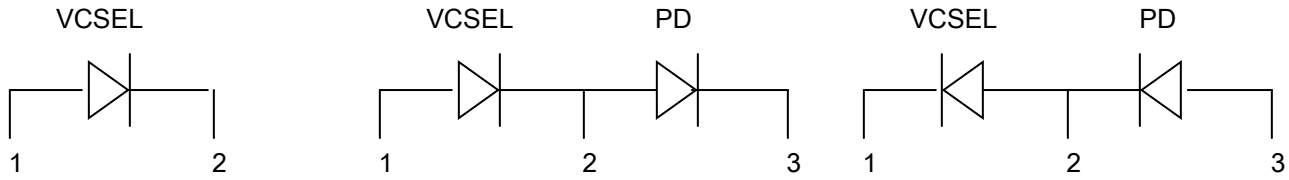
Performance

OPV300 & OPV310





OPV300	
Pin	**Connection**
1	VCSEL Anode
2	VCSEL Cathode
3	No Connection

OPV310	
Pin	**Connection**
1	VCSEL Anode
2	VCSEL Cathode/PD Anode
3	PD Cathode

OPV310Y	
Pin	**Connection**
1	VCSEL Cathode
2	VCSEL Anode/PD Cathode
3	PD Anode

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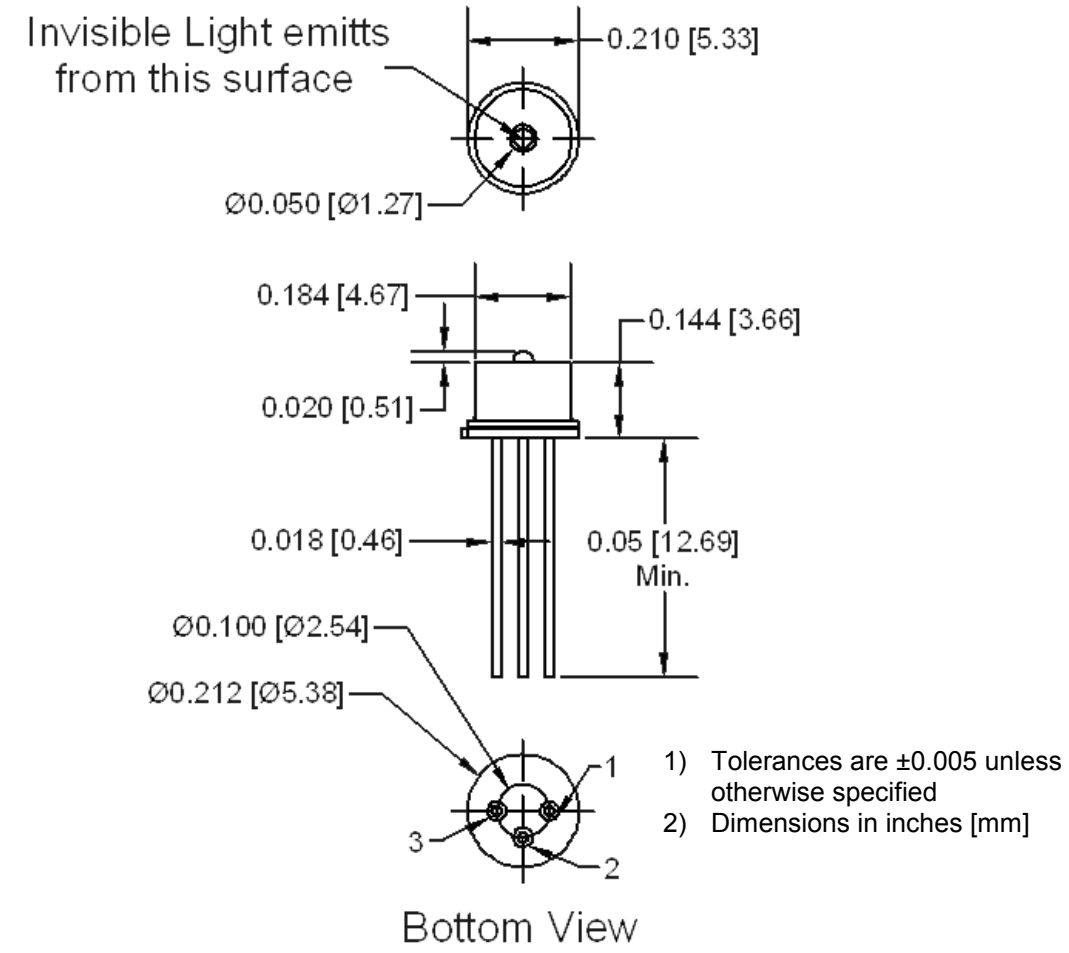
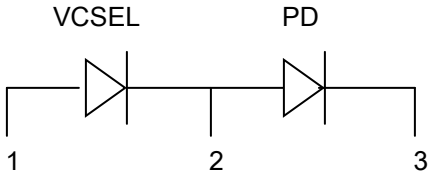
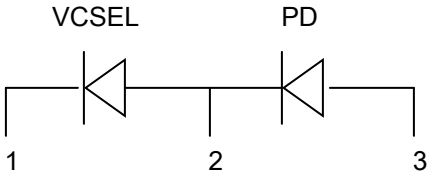
OPV314



1) Tolerances are ±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

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Issue	Change Description	Approval	Date
A	New Format Release	Walter Garcia Brooks	4/21/2008
A.1	Switch max ratings for Operating Temp & Storage Temp Range	Rick Cronan	6/20/08
A.2	Update Absolute Maximum Ratings chart & Electrical Characteristics	Harry Whitford	9/1/09
B	Change the Units for Temp Coefficient of Wavelength on the electrical table from %/deg. C to nm/ºC.	Harry Whitford	8/3/2015

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