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Vertical Cavity Surface Emitting Laser in TO-46 Package

TT electronics
OPTEK Technology

OPV302

- 850nm VCSEL technology
- High thermal stability
- Low drive current
- High output power
- Narrow Beam Angle



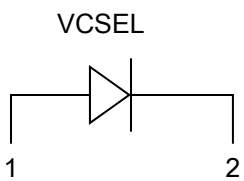
The OPV302 is a Vertical Cavity Surface Emitting Laser (VCSEL) packaged in a dome lens TO-46 package. VCSELs offer many advantages in sensing applications when compared to infrared LEDs. These devices require substantially lower drive currents to obtain the same amount of output power as LEDs. This feature allows VCSELs to be used in low power consumption applications such as battery operated equipment.

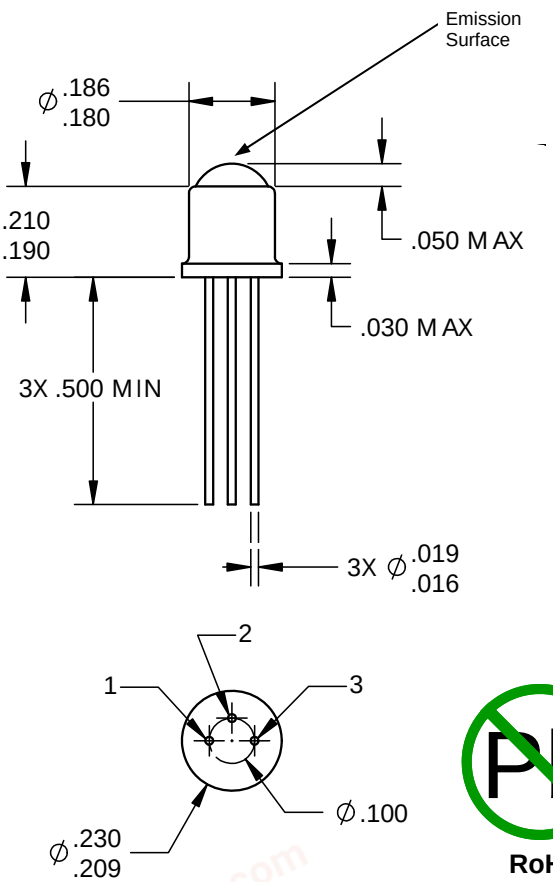
The dome lens packaging creates a narrow beam angle from the device. Long distance applications may benefit from this feature as secondary optics may be eliminated, reducing total system cost. The OPV302 is optically and spectrally compatible with Optek's standard detector products such as the OP800 series phototransistors, OP830 series photodarlingtons and the OP910 photodiode.

Applications

- Non-contact position sensing
- Photoelectric sensors
- Optical encoders
- Light curtains

OPV302	
Pin	**Connection**
1	VCSEL Anode
2	VCSEL Cathode
3	No Connection







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.

Pb
RoHS

Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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VCSEL in TO-46 Package

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Absolute Maximum Ratings

T_A = 25° C unless otherwise noted

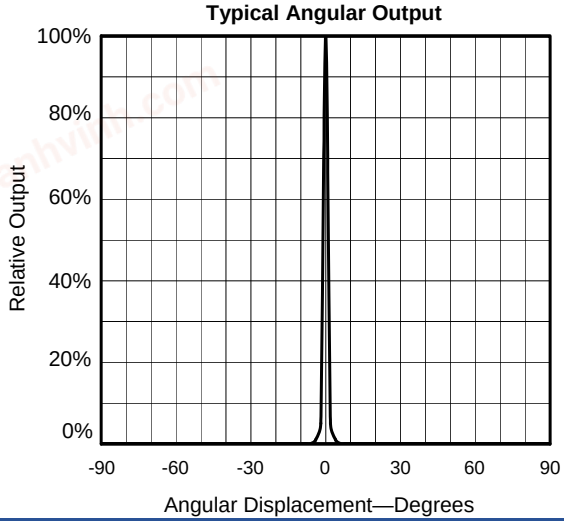
Storage Temperature Range	-40° to +100° C
Operating Temperature Range	0° to +85° C
Lead Soldering Temperature [1/16 inch (1.6mm) from case for 5 sec with soldering iron]	260° C(1)
Maximum Forward Peak Current, Continuous	12 mA
Maximum Reverse Voltage	5 V
Maximum Forward Current, Pulsed (1µs P.W., 10% D.C.)	48mA

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
P_{OT}	Total Power Out	1.5			mW	I_F = 7 mA
I_{TH}	Threshold Current			3.0	mA	Note 2
V_F	Forward Voltage			2.2	V	I_F = 7 mA
I_R	Reverse Current			100	nA	V_R = 5 V
R_S	Series Resistance	20		55	ohms	Note 3
η	Slope Efficiency	0.28			mW/mA	Note 4
λ	Wavelength	840		860	nm	
$\Delta\lambda$	Optical Bandwidth			0.85	nm	
θ	Beam Divergence		4		Degrees	FWHM
$\Delta\eta/\Delta T$	Temp Coefficient of Slope Efficiency		-0.50		%/°C	(0° - 70°C), Note 4
$\Delta\lambda/\Delta T$	Temp Coefficient of Wavelength		0.06		nm/°C	(0° - 70°C)
ΔI_{TH}	Temp Variance of Threshold Current		±1.0		mA	(0° - 70°C), Note 2
$\Delta V_F/\Delta T$	Temp Coefficient for Forward Voltage		-2.5		mV/°C	(0° - 70°C)

NOTES:
(1) RMA flux is recommended. Solder dwell time can be increased to 10 seconds when flow soldering.
(2) 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.
(3) Series Resistance is the slope of the Voltage-Current line from 5 to 8 mA.
(4) Slope efficiency, is the slope of the best fit LI line from 5 mA to 8 mA with 0.25mA test intervals.

Typical Angular Output



Normalized Output Power vs. Forward Current

