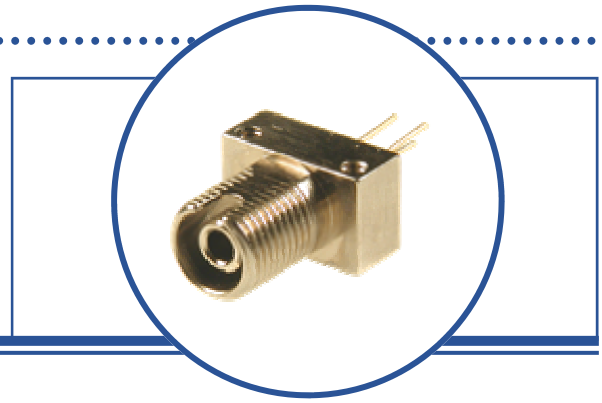
Vertical Cavity Surface Emitting Laser in FC Optical Sub-Assembly

TT electronics
OPTEK Technology

OPV314F, OPV314YF, OPV315F, OPV315YF

- 850 nm VCSEL technology, up to 2.5 Gbps data rate
- High thermal stability with Microbead lens
- High optical coupling to MM fiber with FC style receptacle
- Recommended for multimode fiber applications
- Burned in for communication level reliability



The OPV31XF and OPV31XYF are a high performance 850nm Vertical Cavity Surface Emitting Laser (VCSEL) packaged for high speed communication links. OPV31XF combines all the performance advantages of a VCSEL with the addition of a power monitor diode for precise control of optical power. The VCSEL is a current device assuming the forward voltage drop, from 1.6 to 2.2 volts, is achieved.

The OPV31XF and OPV31XYF are electrically and optically identical, they differ only in pin out. Refer to the charts below.

The OPV315 devices have an attenuation coating on the interior surface of the lens. The coating reflects about 40% of the light reducing noise in special applications, preventing overdriving of sensitive detectors and doubling monitor current.

These product's include a combination of features including high speed with high output power and a concentric beam there by making it an ideal transmitter for integration into all types of data communications equipment.

Applications include:

- Fibre Channel
- Gigabit Ethernet
- ATM
- VSR (Very Short Reach)
- Intra-system links
- Optical backplane interconnects.

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

Ordering Information

Please order part number:

OPV314F—Common VCSEL Cathode / Pin Diode Anode
OPV314YF—Common VCSEL Anode / Pin Diode Cathode
OPV315F—Common VCSEL Cathode / Pin Diode Anode, Attenuated Power
OPV315YF—Common VCSEL Anode / Pin Diode Cathode1, Attenuated Power

OPV314F, OPV315F	
Pin	**Connection**
1	VCSEL Anode
2	VCSEL Cathode/PD Anode
3	PD Cathode

OPV314YF, OPV315YF	
Pin	**Connection**
1	VCSEL Cathode
2	VCSEL Anode/PD Cathode
3	PD Anode

OPTEK Technology Inc.— 1645 Wallace Drive, Carrollton, Texas 75006
Phone: (800) 341-4747 FAX: (972) 323– 2396 sensors@optekinc.com www.optekinc.com

Optek
A subsidiary of
TT electronics plc
Issue A 04.04

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

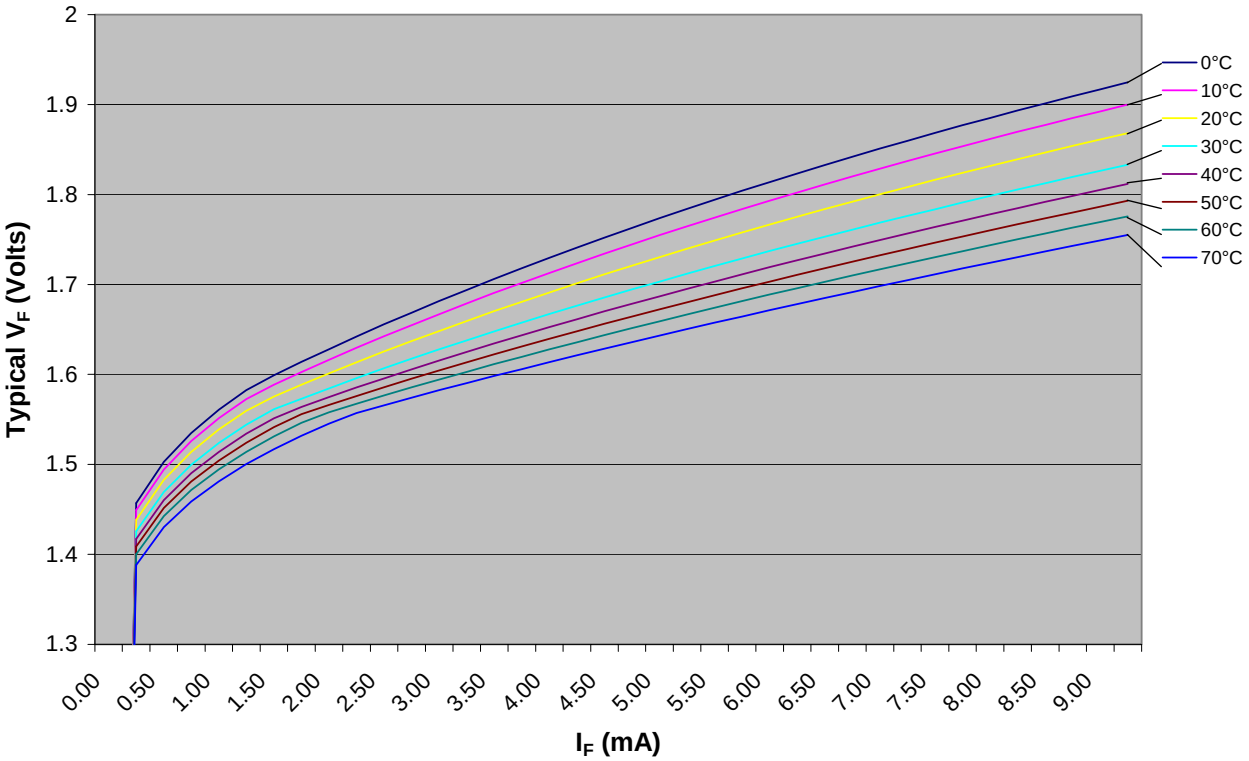
Storage Temperature	-40° C to +100° C
Operating Temperature	0° C to +70° C
Maximum Forward Peak Current	20 mA
Maximum Reverse Voltage	10 V
Lead Soldering Temperature (1/16" (1.6mm) from case for 5 seconds with soldering iron)	260° C (1)

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

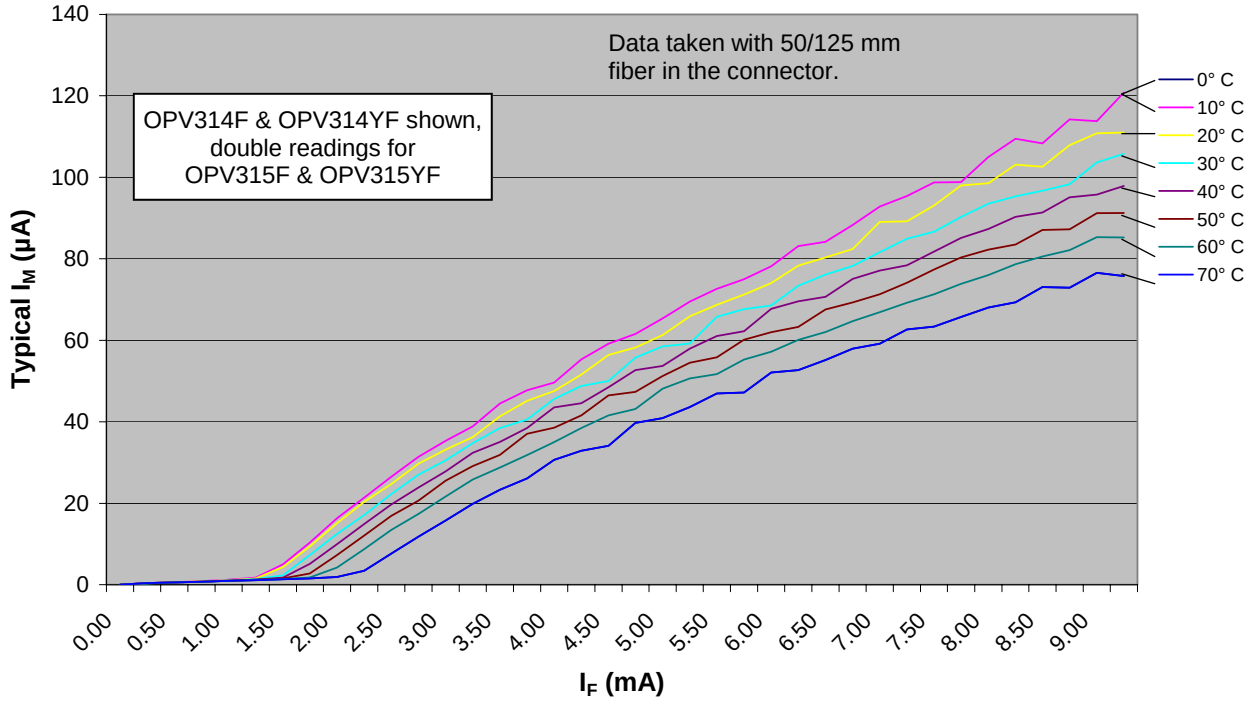
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITION
P_{T50}	Total Coupled Power (OPV314, OPV314Y)	500			µW	I_F = 7 mA, Fiber 50/125µm
	(OPV315, OPV315Y)	250			µW	
I_{TH}	Threshold Current	0.8		3.0	mA	Note1
V_F	Forward Voltage	1.6		2.2	V	I_F = 7 mA
I_R	Reverse Current			35	nA	V_R = 5 V
R_S	Series Resistance	20		55	ohms	Note 2
η	Slope Efficiency (OPV314, OPV314Y)	50			µW/mA	Note 3
	(OPV315, OPV315Y)	25			µW/mA	
I_{RPD}	Reverse Current, photo diode			30	nA	V_R = 40 V
I_M	Monitor Current (OPV314, OPV314Y)	50			µA	I_F = 7 mA, V_R = 5 V
	(OPV315, OPV315Y)	100			µA	
λ	Wavelength	840		860	nm	
Δλ	Optical Bandwidth			0.85	nm	
t_r	Rise Time		90		ps	20% to 80%
t_f	Fall Time		120		ps	80% to 20%
N_{RI}	Relative Intensity Noise		-123		db/Hz	
Δη/ΔT	Temp Coefficient of Slope Efficiency		-0.4		%/°C	(0° - 70° C)
$\Delta I_{TH}/\Delta T$	Temp Coefficient of Threshold Current		±0.1		mA	0° - 70° C
Δλ/ΔT	Temp Coefficient of Wavelength		0.06		nm/°C	0° - 70° C
ΔVf/ΔT	Temperature Coefficient for VF		-2.5		mV/°C	

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. Measured with a 50/125 µm fiber.
(4) Linearity—Using data points taken for slope efficiency above, data L/delta I shall be calculated for each adjacent pair of points.

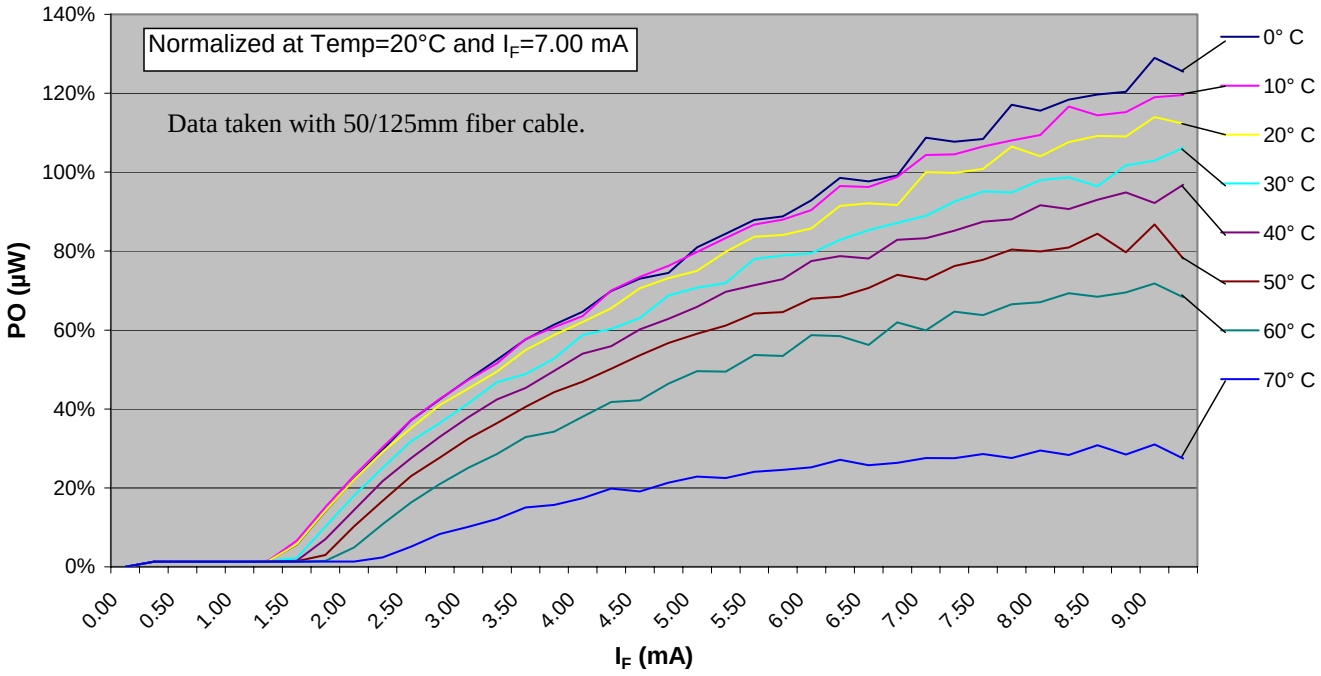
Forward Voltage (V_F) vs Forward Current (I_F) vs Temperture



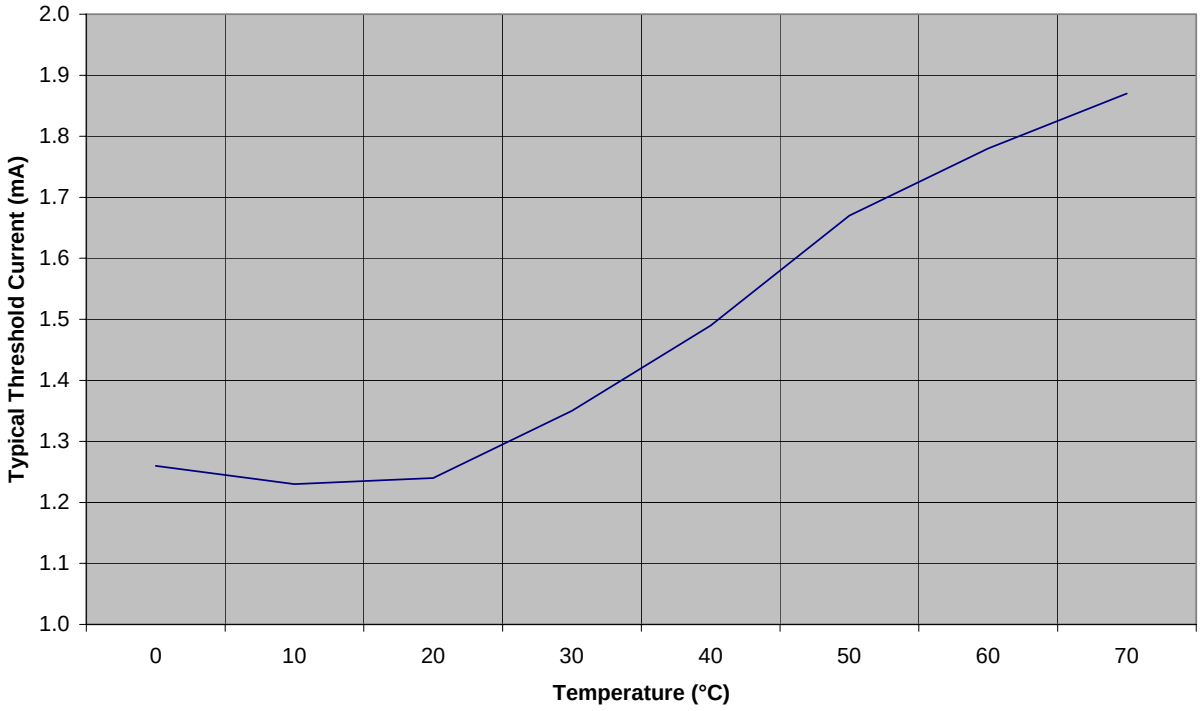
Monitor Diode Current (I_M) vs Forward Current (I_F) vs Temperature

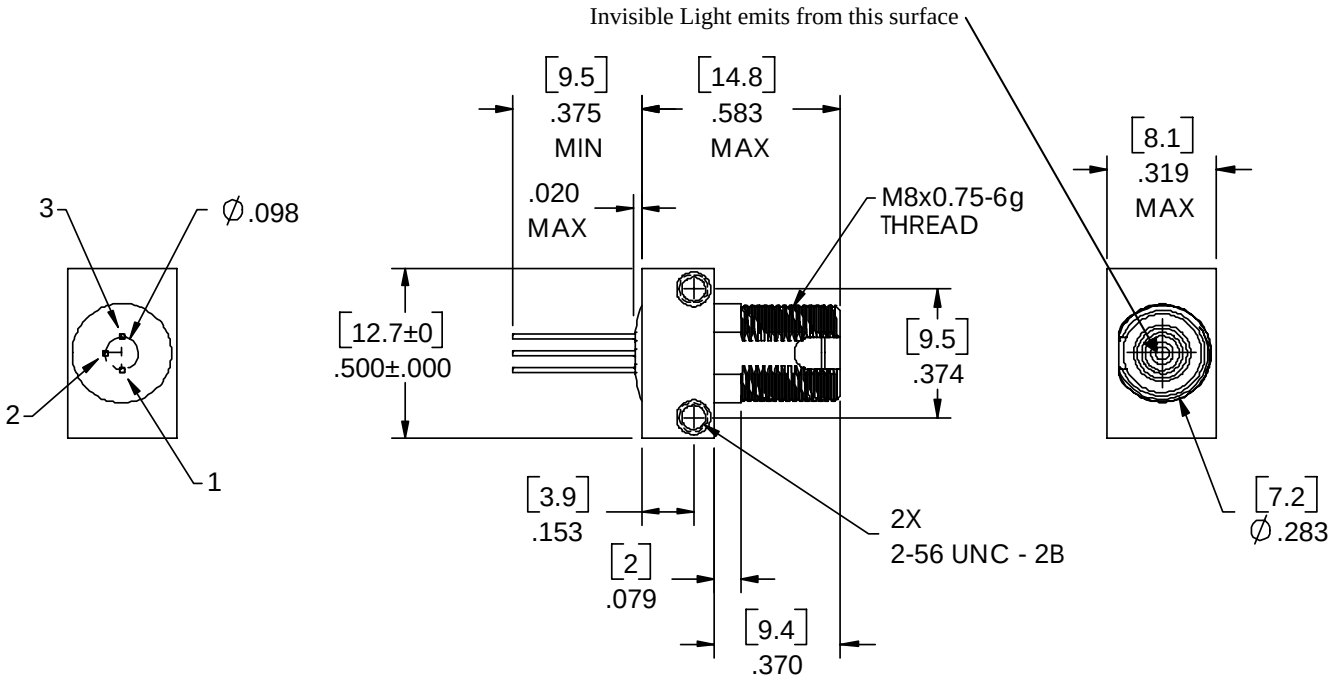


Power Out (PO) vs Forward Current (I_F) vs Temperature

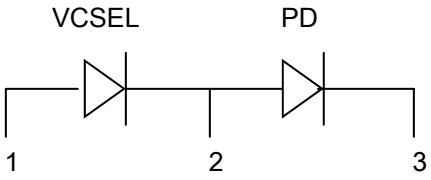


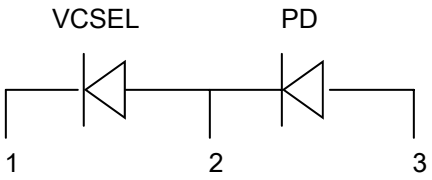
Threshold vs Temperature





DIMENSIONS ARE IN [MILIMITERS] AND INCHES.





OPV314F, OPV315F	
Pin	**Connection**
1	VCSEL Anode
2	VCSEL Cathode/PD Anode
3	PD Cathode

OPV314YF, OPV315YF	
Pin	**Connection**
1	VCSEL Cathode
2	VCSEL Anode/PD Cathode
3	PD Anode