

850nm Multi-Mode VCSEL with Integrated Monitor Photodiode & Temperature Sensor 850M-0000-BCx1*



PRODUCT DESCRIPTION

Multi-transverse mode 850nm VCSEL with an integrated monitoring photodiode and temperature sensor in an industry standard TO-46 package. This product enables a very stable output power by measuring the emitted light directly (not reflected) from the VCSEL and makes the temperature available so the MPD's output (which is dependent on temperature) can be correctly interpreted.

Visible Vertical Cavity Surface Emitting Laser (VCSEL)

This coherent optical source is designed for OEM applications such as position sensing, motion control, medical devices, or short distance fiber communication. A VCSEL is ideal for:

- A source for high speed, short distance, optical communication applications
- Absorptive or spectroscopic sensors requiring a particular wavelength
- High resolution applications requiring a small spot size

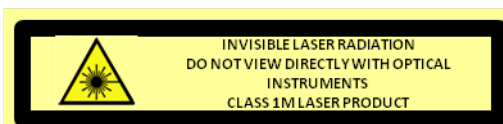
Features:

- Integrated photodiode monitor and temperature sensor for automated power control
- Superior temperature tracking linearity
- Low beam divergence angle
- Low operating current (<10mA)
- Circular beam profile
- Narrow spectral width (<1nm)

Package Details: See separate packages datasheet at <http://www.vixarinc.com/pdf/PackagesDS.pdf>

* -- "x" denotes the character position of option designators. See "Ordering Information" at end of datasheet for details.

RoHS
Compliant





Absolute Maximum Ratings

Storage temperature	-40°C to +125°C
Operating temperature	0°C to +85°C
Lead solder temperature	260°C, 10 sec
Laser continuous average current	8 mA
Laser reverse voltage	5V

Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only. Functional operation of the device at these or any other conditions beyond those indicated for extended periods of time may affect device reliability.

Electro-Optical Characteristics

VCSEL

Parameter	Symbol	Units	Minimum	Typical	Maximum	Notes
Threshold current	I_{th}	mA	1.0	1.5	2.0	Room temperature
Peak Pulsed Current	I_{f-p}	mA	--	15	--	< 10 μ s duration 1% duty cycle
Maximum DC Current	I_{max}	mA			8	For reliable operation
Operating Voltage	V_f	Volts	2.0	2.4	2.7	$I_f = 5$ mA
Device series resistance	R_s	Ohms	100	120	150	$I_f = 5$ mA
Operating Wavelength	λ_{op}	nm	840	850	860	$I_f = 5$ mA
Wavelength temp coefficient	$d\lambda/dT$	nm/C	--	0.06	--	
Optical output power (25C)	$P_o(25)$	mW	1.0	1.3	1.5	
Slope efficiency	η	mW/mA	.35	0.40	0.55	Includes absorption by monitor photodiode
Spectral bandwidth-RMS	$\Delta\lambda$	nm	--	--	1	
Beam divergence		deg	--	15		FWHM
Reverse Breakdown	V_{br}	Volts	10	--	--	$I_r = 1$ nA
Rise time	t_r	ps	--	--	100	20-80 %
Fall time	t_f	ps	--	--	100	20-80 %
Relative Intensity Noise	RIN	dB/Hz	--	-130		$I_f = 7$ mA

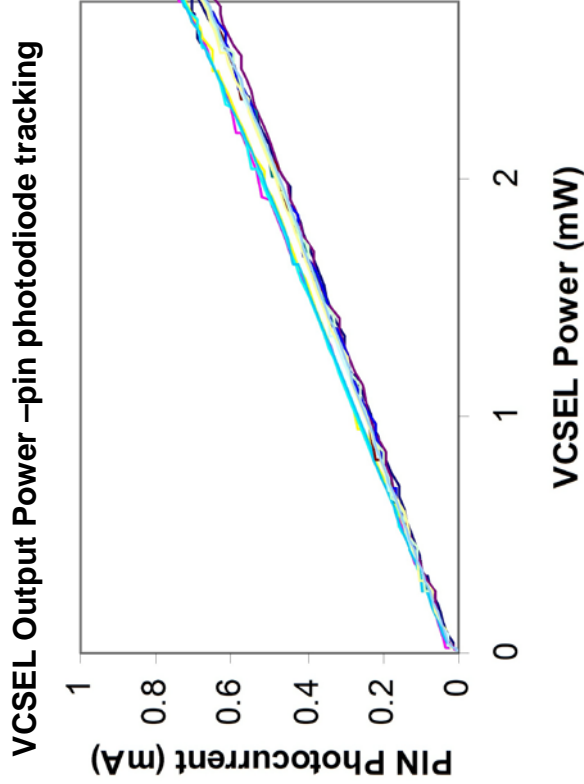
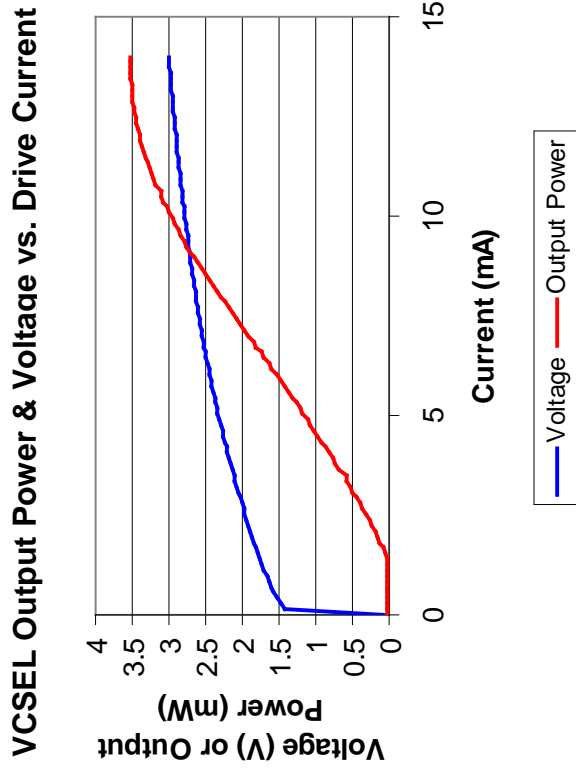
Monitor Photodiode

Parameter	Symbol	Units	Minimum	Typical	Maximum	Notes
Responsivity		mA/mW	0.25	0.26	0.27	Room temperature
Dark Current	I_d	nA	--	80	--	-5V bias, RT

Temperature Sensor

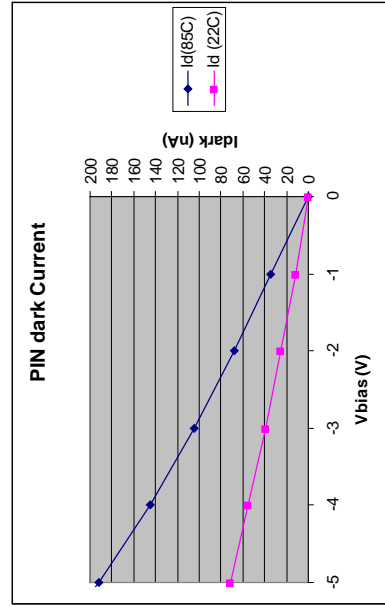
Parameter	Symbol	Units	Minimum	Typical	Maximum	Notes
Diode Temperature Sensitivity	dV/dT	mV/°C	--	-1.4	--	At 100 μ A forward bias

TYPICAL PERFORMANCE CURVES:

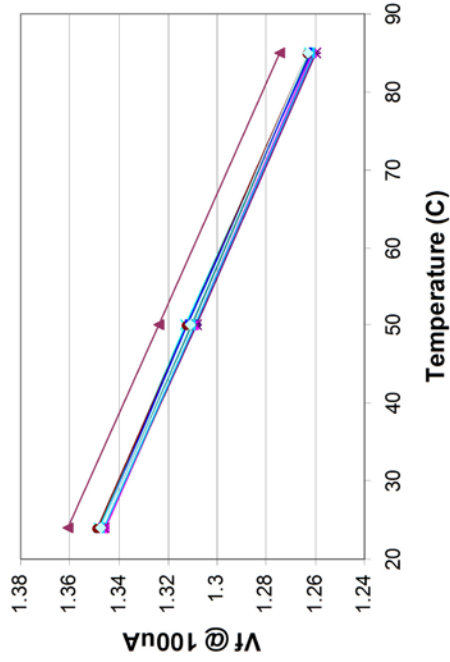


p-i-n Photodiode Dark Current

Temperature Response = -1.4mV/°C, Forward Voltage at 100µamp bias



Temperature Sensor Performance





ORDERING INFORMATION

Description	Part Number
850nm multi-mode VCSEL, Monitor Photodiode and Temperature Sensor in TO-46 package	850M-0000-BC01
850nm multi-mode VCSEL, Monitor Photodiode, Temperature Sensor, and ESD diode in TO-46 package	850M-0000-BC91



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