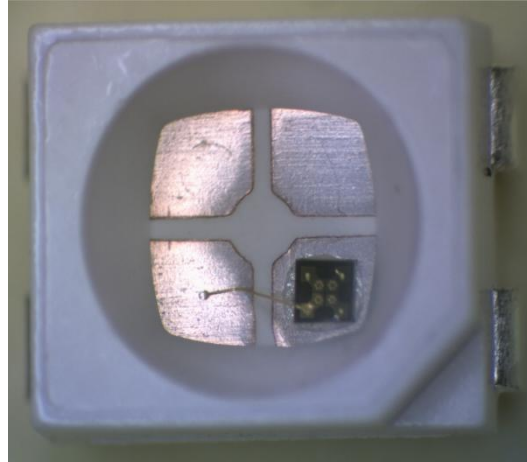


680nm Communications Grade VCSEL

680C-0000-x001, 680C-0000-x091*



PRODUCT DESCRIPTION

High-speed, 680nm Vertical Cavity Surface Emitting Laser (VCSEL) available in several packages (see Ordering Information below). This VCSEL is designed for data communications applications, particularly when using Polymer Optical Fiber (POF).

Features:

- Up to 3.5 Gbps†
- Circular beam with low divergence angle
- Low operating current

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.

† The eye diagrams on page 3 were taken on bare die with a high speed probe. Operation to at least 3 Gbps has also been verified using a TO-46 high speed package with a high speed test board with short leads between header and board. Signal integrity (eye diagram quality) is dependent on the packaging.

RoHS
Compliant





Absolute Maximum Ratings

Parameter	Symbol	Rating	Notes
Storage temperature		-40 to 125 °C	
Operating temperature (VCSEL)	Tv	-20 to 70 °C	
Lead solder temperature		260°C, 10 seconds	
CW current (VCSEL)		7 mA	(Note 1)
Maximum pulsed current		15 mA	<1µs pulse width, 1% duty cycle, T=30°C (Note 2)
Laser reverse voltage		5 V	(Note 3)

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 Operating Temp (Tv) =30°C & Operating Current=5mA unless otherwise stated)

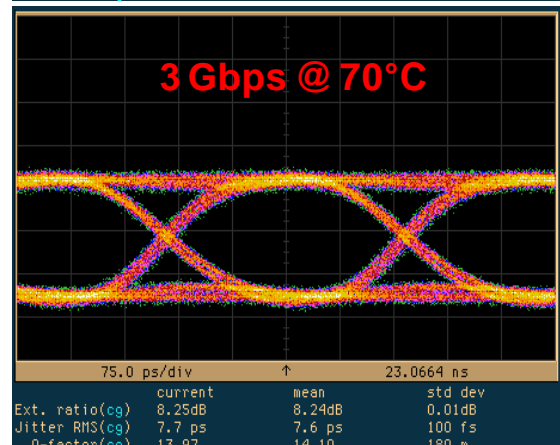
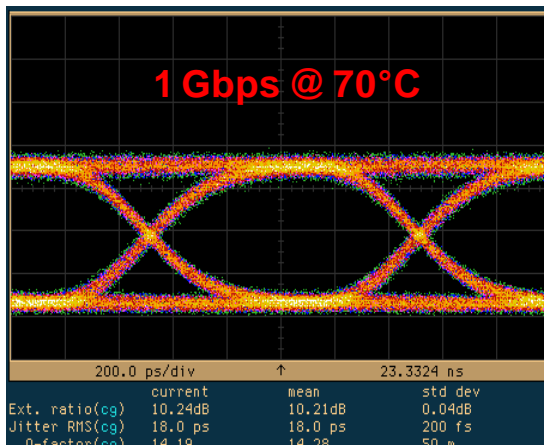
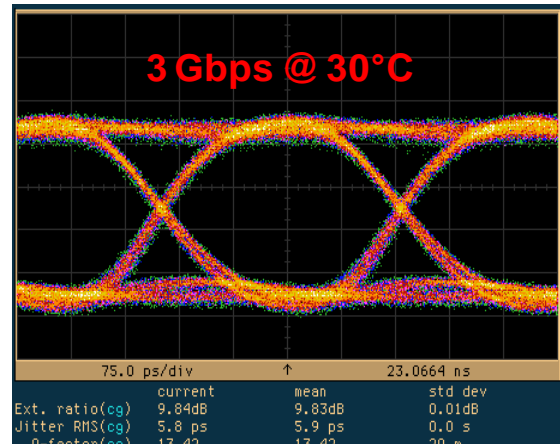
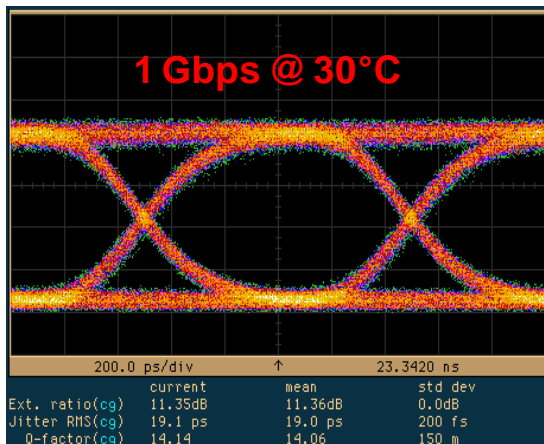
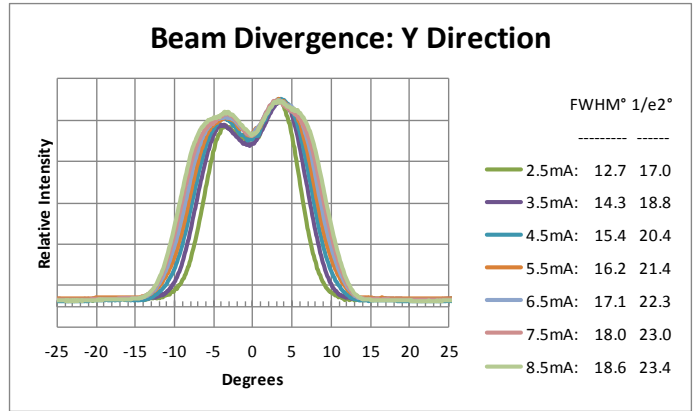
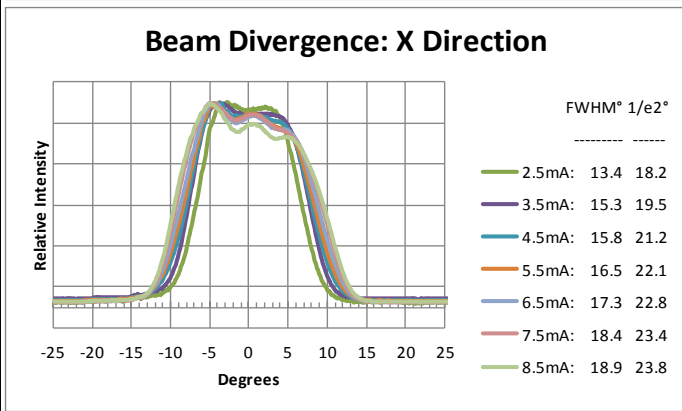
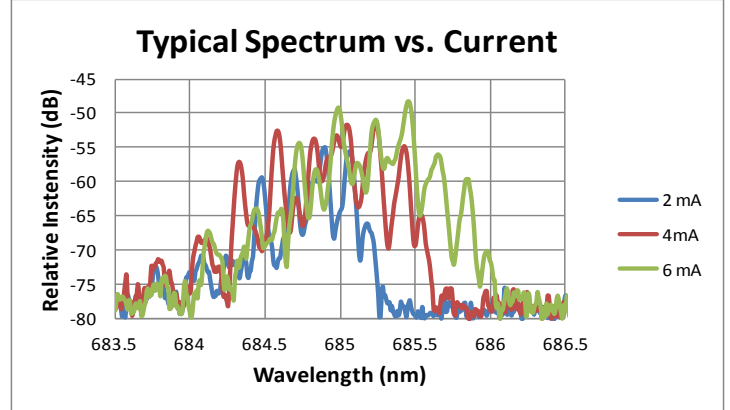
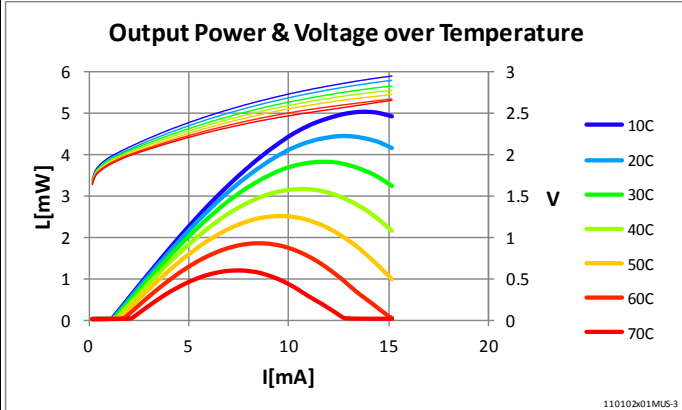
Parameter	Symbol	Units	Minimum	Typical	Maximum	Notes
Threshold current	Ith	mA	0.5	1.3	2	
Operating voltage	Vf	Volts	--	2.4	2.7	
Series resistance (VCSEL)	Rs	Ohms	--	100	--	
Slope efficiency	SE	mW/mA	--	0.5	--	
Optical output power	Lop	mW	1.7	2.2	2.7	T=30°C
Optical output power	Lop	mW	--	--	--	T=50°C
Optical output power	Lop	mW	--	0.9	--	T=70°C
Reverse breakdown voltage		V	10	--	--	Ir ≤ 1nA
Operating wavelength	λop	nm	675	680	695	
Spectral width (RMS)	Δλ	nm	--	--	3	
Beam divergence 1/e2		deg	--	21	--	Whole angle
Beam divergence FWHM	FWHM	deg	--	16	--	Whole angle
Wavelength temp. coefficient		nm/°C	--	0.045	--	
Rise time		ps	--	--	80	20%-80%
Fall time		ps	--	--	80	20%-80%
Relative intensity noise	RIN		--	-130	--	DC to 3 GHz
Modulation bandwidth (-3 dB)	BW	GHz	5	--	--	

Note 1: The maximum CW laser current in the Absolute Maximum Ratings is valid for the operating temperature noted at the top of this table; however, the maximum CW laser current decreases with increasing temperature. Contact Vixar for maximum CW laser current values at other temperatures.

Note 2: For details refer to the Vixar Application Note "Operation of VCSELs Under Pulsed Conditions".
(<http://www.vixarinc.com/technology/applicationnotes.html>)

Note 3: For details refer to the Vixar Application Note "VCSEL EOS/ESD Considerations and Lifetime Optimization".
(<http://www.vixarinc.com/technology/applicationnotes.html>)

TYPICAL PERFORMANCE CURVES:





ORDERING INFORMATION

Description	ESD Diode ⁽¹⁾	Package	Hermetically Sealed ⁽²⁾	Part Number
680 nm communications grade VCSEL		TO-46		680C-0000-B001
680 nm communications grade VCSEL	✓	TO-46		680C-0000-B091
680 nm communications grade VCSEL		TO-46	✓ ⁽²⁾	680C-0000-G001
680 nm communications grade VCSEL	✓	TO-46	✓ ⁽²⁾	680C-0000-G091
680 nm communications grade VCSEL		PLCC2 SMT		680C -0000-D001
680 nm communications grade VCSEL	✓	PLCC2 SMT		680C -0000-D091
680 nm communications grade VCSEL		PLCC4 SMT ⁽³⁾		680C -0000-C001
680 nm communications grade VCSEL	✓	PLCC4 SMT ⁽³⁾		680C -0000-C091

⁽¹⁾ Do not include an ESD diode if the part will be modulated at a frequency ≥ 35 MHz.

⁽²⁾ Hermetically sealed (recommended for multi-mode VCSELs operated in environments with high humidity or to maximize lifetime)

⁽³⁾ May require MOQ or NRE charge.



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