

# BW10-1654-T-TO

**BANDWIDTH10, LTD.****Description:**

Bandwidth10's BW10-1654-T-TO is part of a family of lasers based on the innovative High Contrast Grating (HCG) single mode 1654 nm VCSEL.

**Applications:**

- Optical gas sensing (CH<sub>4</sub>)
- Range Finding
- OTDR
- Optical communications (U-band)

**Features:**

- TO-56 7Pin Small Form Footprint
- Aspherical lens cap
- Integrated TEC (Temperature Stabilization)
- CW Optical Output Power
- Single Mode VCSEL (~1654 nm)
- Fast Wavelength Tuning
- Internal optical isolator with isolation ratio >20 dB

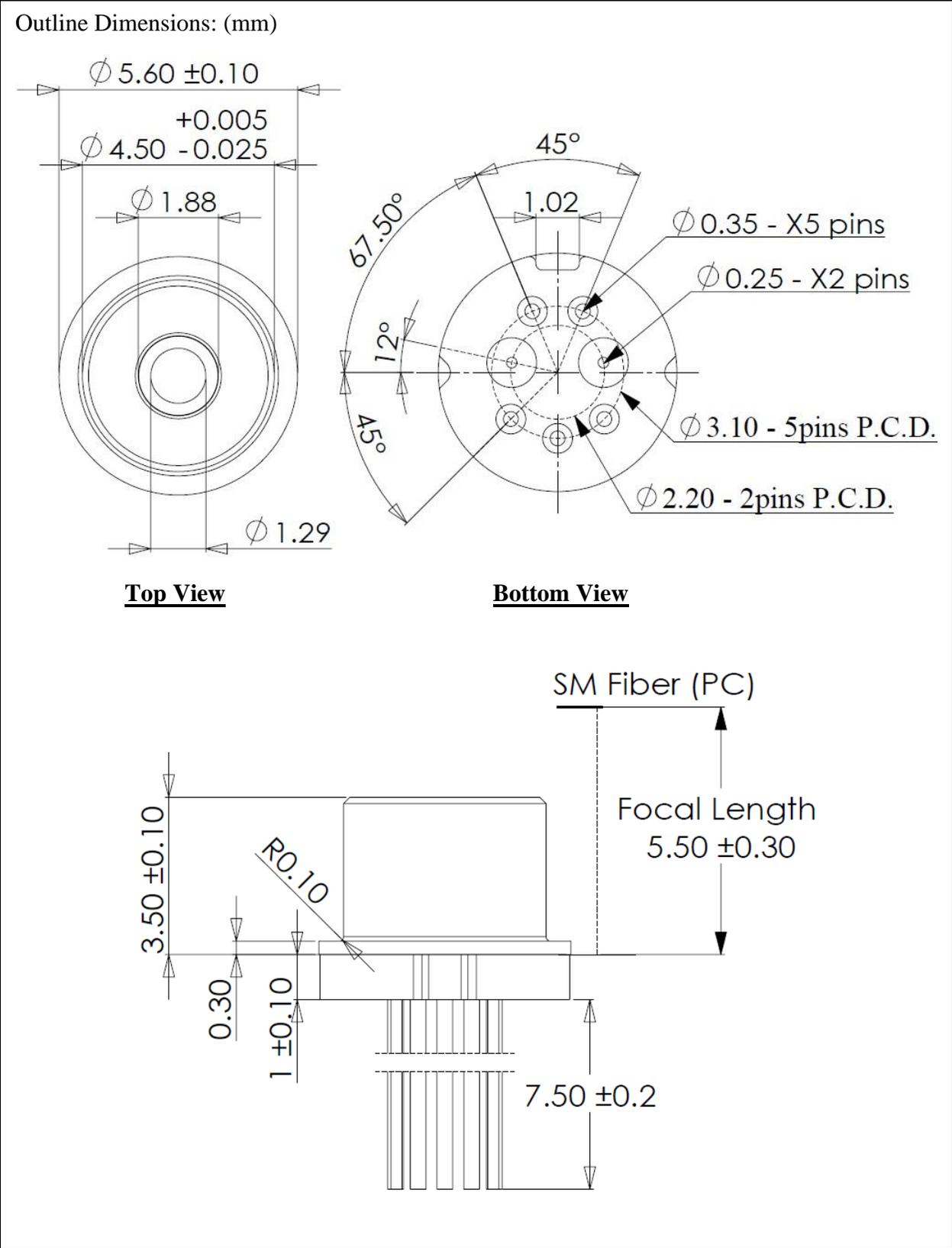
**Pin Assignment and Drawing**

**Bottom View**

PIN NUMBERS	ASSIGNMENT
P1	TEC (+)
P2	LD (-)
P3	TUNING Vt (-)
P4	THERMISTOR (-)
P5	THERMISTOR (+)
P6	LD (+) & Vt (+)
P7	TEC (-)

**CAUTION:** Device is sensitive to electrostatic discharge.

**Dimensional Drawing**



**Absolute Maximum Ratings**

Parameter	Symbol	Ratings	Unit
Storage Temperature	T <sub>stg</sub>	-20 to +85	°C
Operating Case Temperature	T <sub>c</sub>	-5 to +70	°C
Forward Current of VCSEL	I <sub>LD</sub>	30	mA
Reverse Voltage of VCSEL	V <sub>LD</sub>	3	V
Soldering Temperature	T <sub>sld</sub>	350 (10 sec.)	°C

**General Specification and Operating Table**

Parameter	Symbol	Values			Unit
		Min	Typical	Max	
Optical Output Peak Power @25° C TEC temperature over tuning range	P	-3		+6	dBm
Operating Bias Current	I <sub>op</sub>	0	25	30	mA
Operating TEC Temperature range	T <sub>op</sub>	5	20	35	°C
Threshold Current	I <sub>th</sub>		14	16	mA
Laser Drive Voltage	V <sub>cc</sub>	0	1.5	2.5	V
Resistance	R <sub>s</sub>		20		Ω
Center Wavelength	λ		1654		nm
Guaranteed Tuning Range	Δλ	4	8		nm
Guaranteed start wavelength at 25°C, I <sub>op</sub> and V <sub>tune</sub> =0V		1654			nm
Guaranteed stop wavelength at 25°C, I <sub>op</sub> and V <sub>tune</sub> =max				1653	nm
Max. Mechanical Tuning Response	f <sub>max</sub>	100		-	kHz
Side-mode suppression ratio	SMSR	30	40		dB
Linewidth (-3 dB FWHM), CW I <sub>bias</sub> =I <sub>op</sub>	σ			300	MHz
Relative Intensity Noise	RIN			-128	dB/Hz
Tuning Voltage	V <sub>tune</sub>	0	Test Sheet	Test Sheet	V
Tuning Current	I <sub>tune</sub>	0	-	100	μA
TEC Voltage	V <sub>TEC</sub>		0.35	1.5	V
TEC Current	I <sub>TEC</sub>		0.05	0.6	A

**Electrostatic Discharge (ESD)**

LD+/LD- ESD classification: Class 1A, Human Body Model (HBM).

Vt- ESD classification: Class 0, Human Body Model (HBM).

Since this is an ESD sensitive device, proper ESD precautions (limit exposure to below 100V HBM) should be taken during every step of the assembly process.

Standard ESD testing was to MIL-STD-883, Human Body Model, with 3 pulses forward/reverse applied to the signal leads. Failure is defined as a measurable (>10%) change in a key parameter, optical output power for the tunable VCSEL. The LD+/LD- and Vt- of VCSEL TOSA fails at 350 Volts and <50 Volts respectively for damage to the laser chip, with a decrease in optical power output.

**Order and Contact Information**

Model Number	Contact Information
<p style="text-align: center;">BW10-1654-T-TO</p> <p>Please specify center wavelength in the purchase order</p>	<p style="text-align: center;">Bandwidth 10 Ltd. 2080 Addison Street, Suite 2 Berkeley, CA 94704, USA</p> <p style="text-align: center;"><a href="mailto:info@bandwidth10.com">info@bandwidth10.com</a></p>