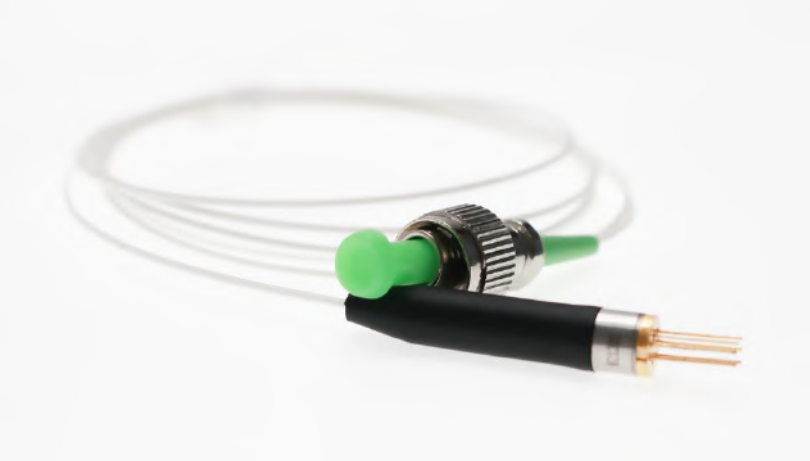
1567nm Pigtailed VCSEL laser (SM-28E Fiber coupled with FC/APC Connector)



Description

A Vertical-Cavity Surface-Emitting Laser (VCSEL) is a kind of semiconductor laser, whose laser is emitted perpendicular to the top surface. Developed on the basis of gallium arsenide semiconductor material, it is different from LED (Light Emitting Diode) and LD (Laser Diode). It consists of a mirror surface, an active layer and a metal contact layer. The two transmitting mirrors are P-type and N-type Bragg transmitters. The active region is composed of quantum hydrazine. A metal contact layer is made on the outer surface of the P-type DBR to form ohmic contact, and a circular outlet is made on the P-type DBR to output laser. It has a small far-field divergence angle, and the divergence angle beam is narrow and round. And the threshold current is low and the modulation frequency is high, which can reach 300KHz. The wavelength tuning can be realized by changing the laser current and temperature. Package with TEC and PD inside, which is specially designed for high-speed optical fiber communication.

Features

- 7 Pin.
- Aspheric lens cap.
- Integrated TEC controls temperature stability.
- Output power 1.6mW
- Single mode, can pass C-L band.
- Wide spectrum tuning range: > 8nm.
- Fast wavelength tuning (~100KHz).

Application

- TDLAS measuring gas system.
- Face recognition.
- Lidar.

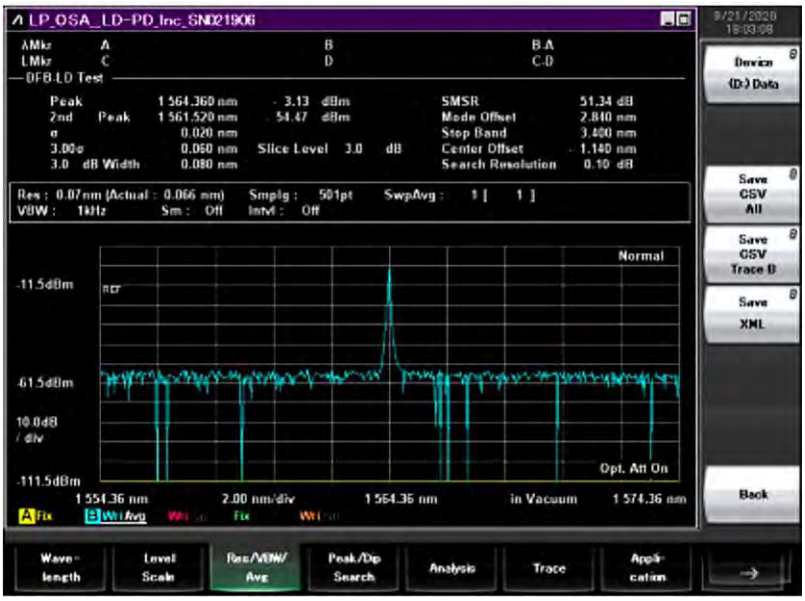
E/O Characteristics

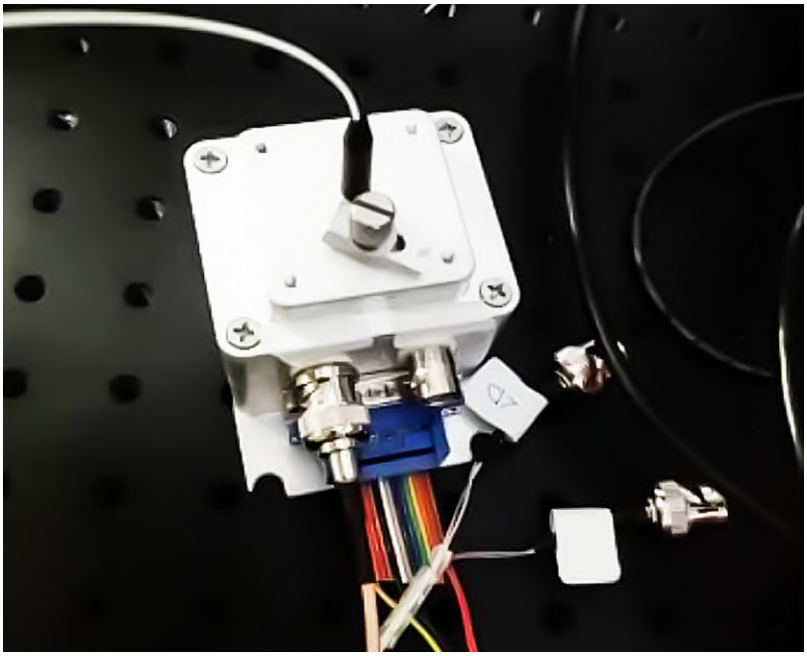
Conditions: P= 20°C, IOP=2.0mA, unless otherwise stated (p = Chip Back Temperature, controlled by TEC).

Parameter	Symbol	Value Min	Typical	Max	Unit
Peak light output power @25 C	P	1.0	1.6		mW
Operating bias current.	Iop	0	18	25	mA
Operating temperature range	Top	-40	25	85	°C
Threshold current	Ith		8	12	mA
Slope efficiency (CW, TC = 25 c)	Se	0.14	0.18		mW/mA
Laser driving voltage	VCC	0	1.5	2.5	V
Resistance	RS		50		Ω
Central wavelength (Please indicate the required central wavelength in the purchase order.)	Δλ	1525		1575	nm
Guaranteed tuning range. Applying a positive voltage will lower the peak wavelength.	λ	8	10		nm
Maximum frequency tuning response.	fmax	100	200	-	KHz
Side mode suppression ratio	SMSR	30	40		dB
Width (-3db full width at half maximum), continuous bias =IOP.	σ			300	MHz
Relative intensity noise	RIN			-128	dB/Hz
Tuning voltage	Vture	0	Test Sheet	Test Sheet	V
Tuning current	Itune	0	-	100	μA
Tec voltage	VTEC		0.35	1.5	V
Tec current	ITEC		0.05	0.6	A

Experimental Data

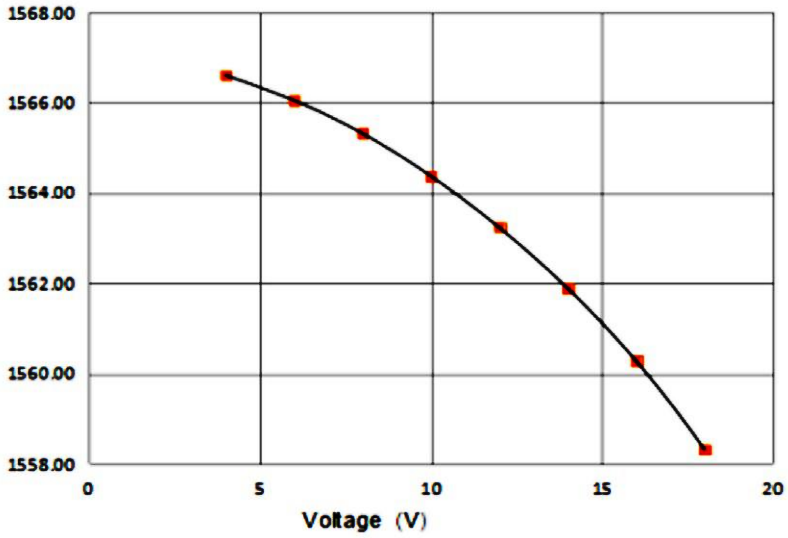
We have carried out related experiments on VCSEL lasers, and measured the relationship between voltage, current and wavelength, and frequency of VCSEL lasers.

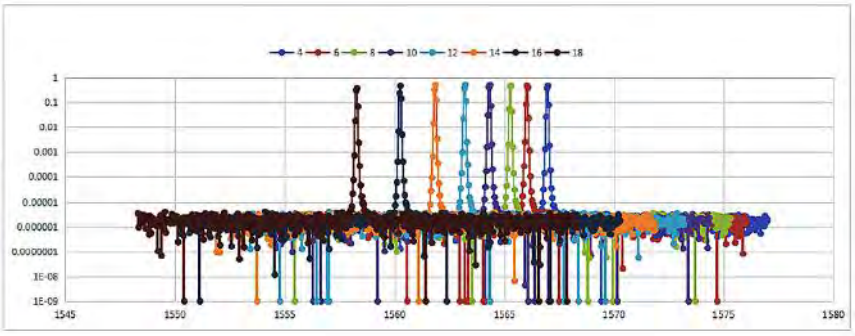




VCSEL spectrogram VCSEL laser measuring base

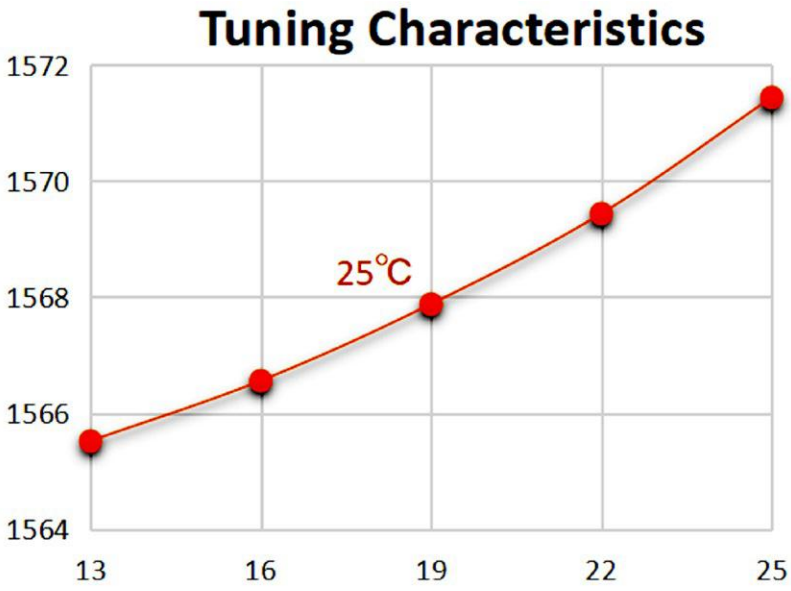
1、Relationship between voltage and wavelength.





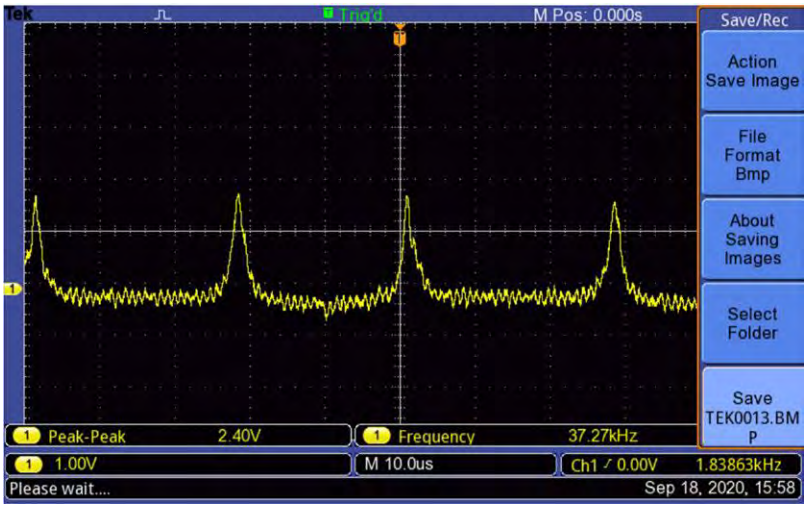
We load the laser with a voltage of 4-18V, and every 2V voltage increases by one point. By measuring the data in the above figure, we can find that with the increase of voltage, the wavelength decreases by about 8nm, showing a negative-going linear curve.

2、Relationship between current and wavelength.

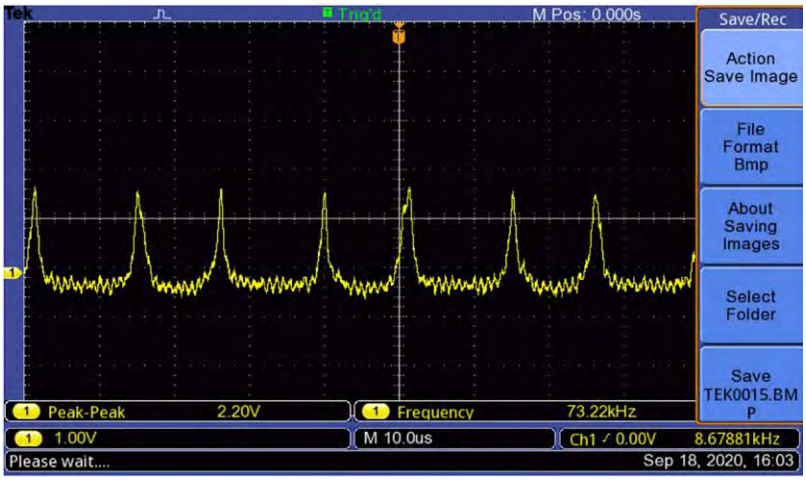


We keep the voltage constant and adjust the current from 13 to 25mA, and test it once every 3mA. It is found that the wavelength changes greatly when the current is adjusted, and it presents a positive linear curve.

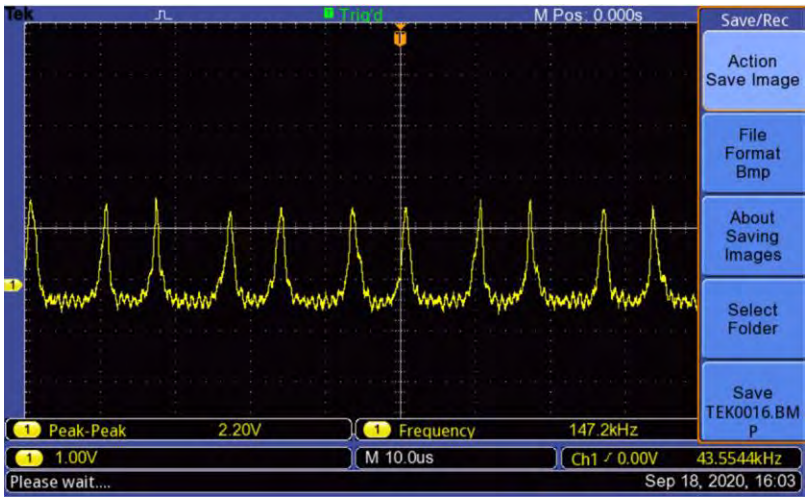
3、Load changes at different frequencies.



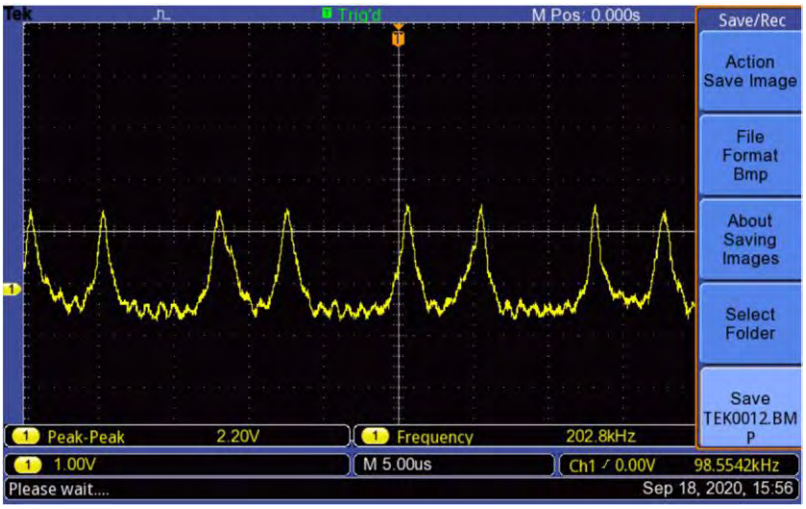
Load 5V voltage and 20KHz frequency waveform.



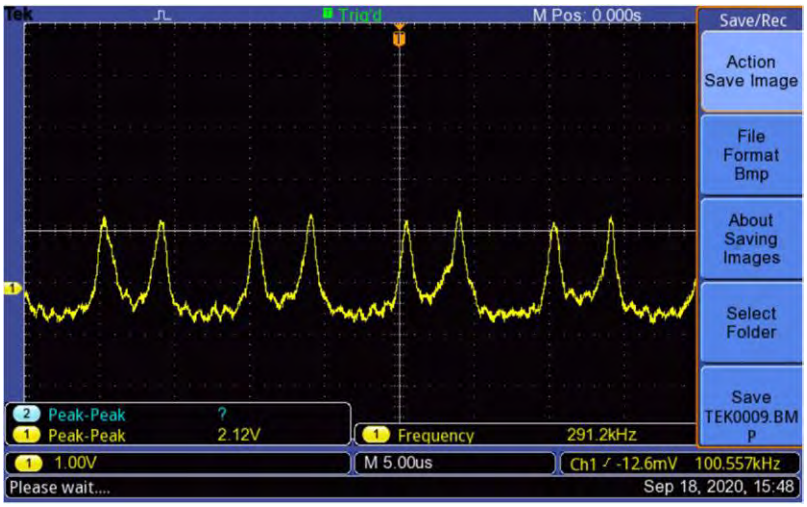
Load 5V voltage and 40KHz frequency waveform.



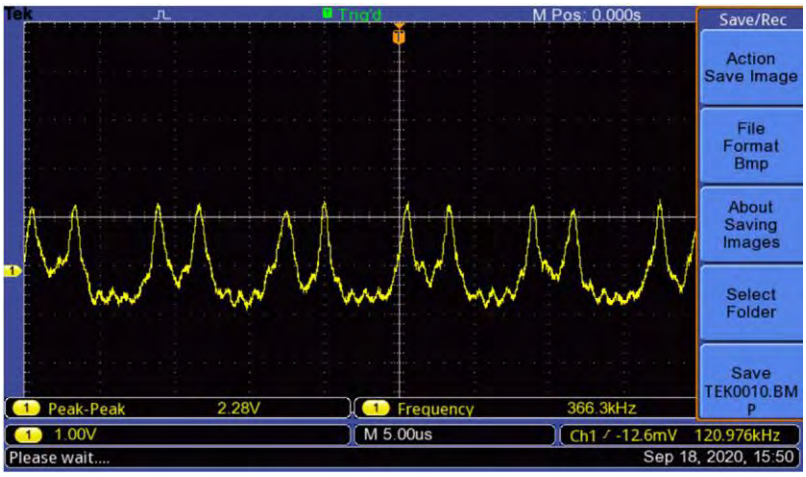
Load 5V voltage, 60KHz frequency waveform.



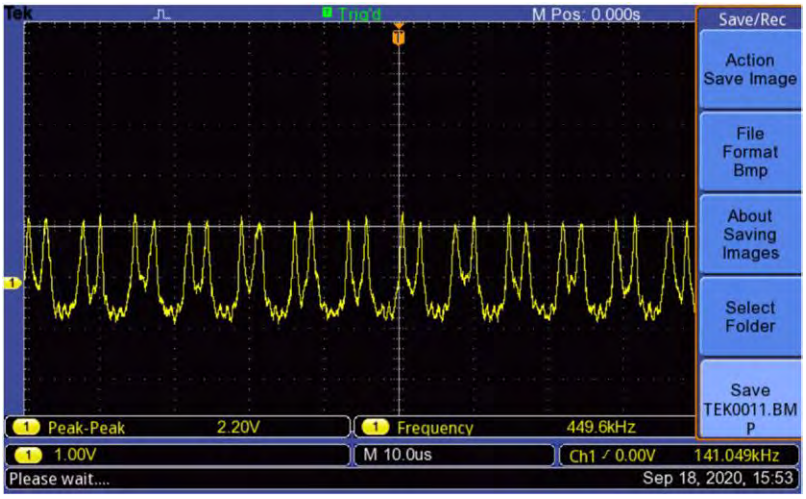
Load 5V voltage and 80KHz frequency waveform.



Load 5V voltage and 100KHz frequency waveform.



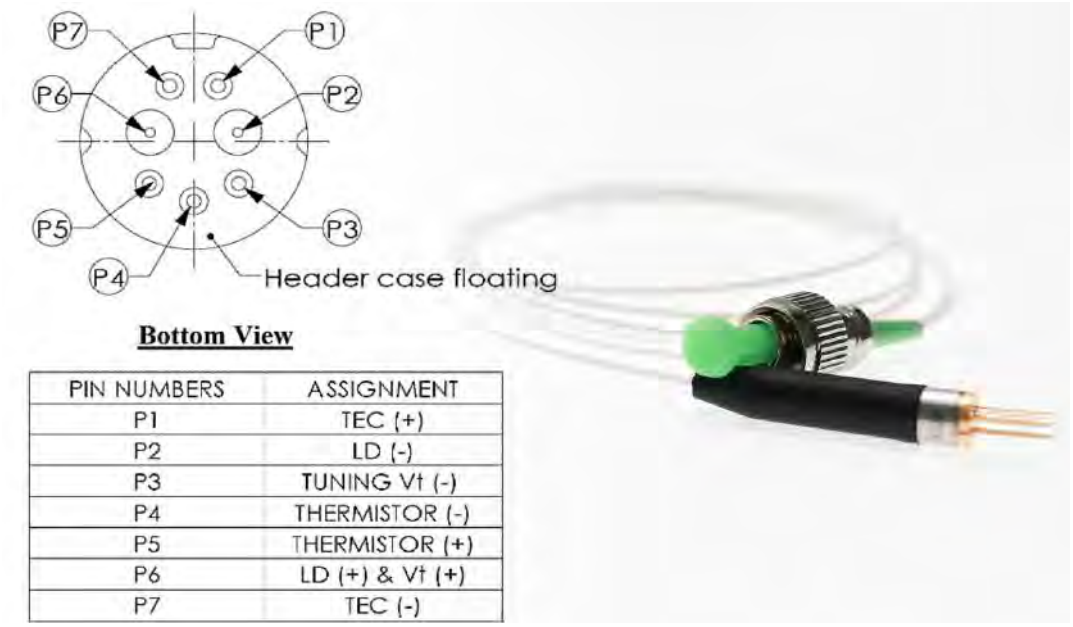
Load 5V voltage and 120KHz frequency waveform.



Load 5V voltage and 140KHz frequency waveform.

Give a fixed voltage of 5V and adjust the frequency value to get the above figure. Our modulation frequency is very high, which can carry more information and has a faster response speed.

Package and size



Bottom View

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

The generation of VCSEL laser is mainly composed of three parts, namely laser working substance, pump source and optical resonant cavity. The pump source is used to excite the working substance, so that the number of particles is reversed and laser light is emitted. Through the resonant cavity formed by the bottom and top mirrors, the oscillation is amplified in the laser cavity and output from the top mirror, and the output light is only concentrated in the part with no oxide layer in the middle, thus forming a vertical laser emission, thus obtaining stable, continuous and high-quality laser with a certain power.

Ordering Info

PL-VCSEL-W□□□□-☆-A8▽

□□□□: Wavelength

0760: 760nm

0795: 794.7nm

*****

1310: 1310nm

1567: 1567nm

☆ : TEC

0: Without TEC

1: With TEC

▽: Wavelength Tolerance

1: ±0.5nm

2: ±1.5nm