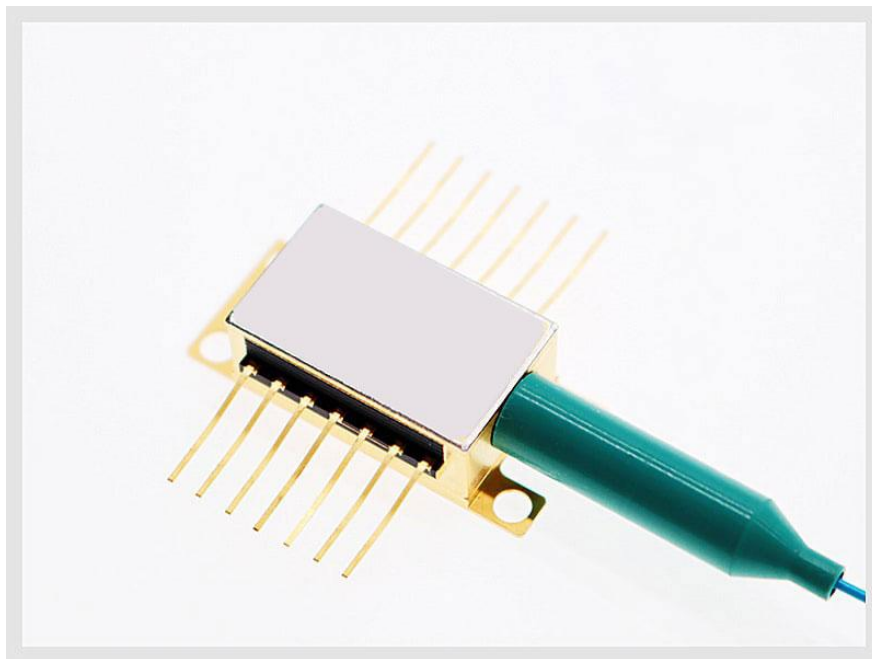




## 850nm butterfly high-speed modulated VCSEL laser 0.1mW polarization-maintaining output



### ● Product Description

Idealphotonics' 850 nm single-mode VCSELs are ideal for demanding sensing applications due to their optimized optical properties. The innovative chip design suppresses high-order longitudinal and transverse modes while providing linear polarization stability.

## ● Product features

Internal TEC and thermistor、 2 nm TEC tunability、 Gaussian beam profile

The absolutely symmetrical Gaussian beam profile significantly simplifies the application optical design、 Small beam divergence, with a range of 20° (1/e<sup>2</sup>) and reproducible divergence angle, facilitates laser beam guidance、

Narrow spectral width, with a laser line with a spectral width of typically 100 MHz, these lasers are designed for spectroscopy applications、 Low power consumption, with a power consumption of only a few milliwatts, battery operation is possible in mobile applications、 T046&TEC、 Specific operating conditions: Laser current IOP = 2 mA Target wavelength  $\lambda$  t = 850 nm @ TOP (adjusted by TEC)

## ● Part Number

MP-VCS-850-0.1-14BF-PA-TEC

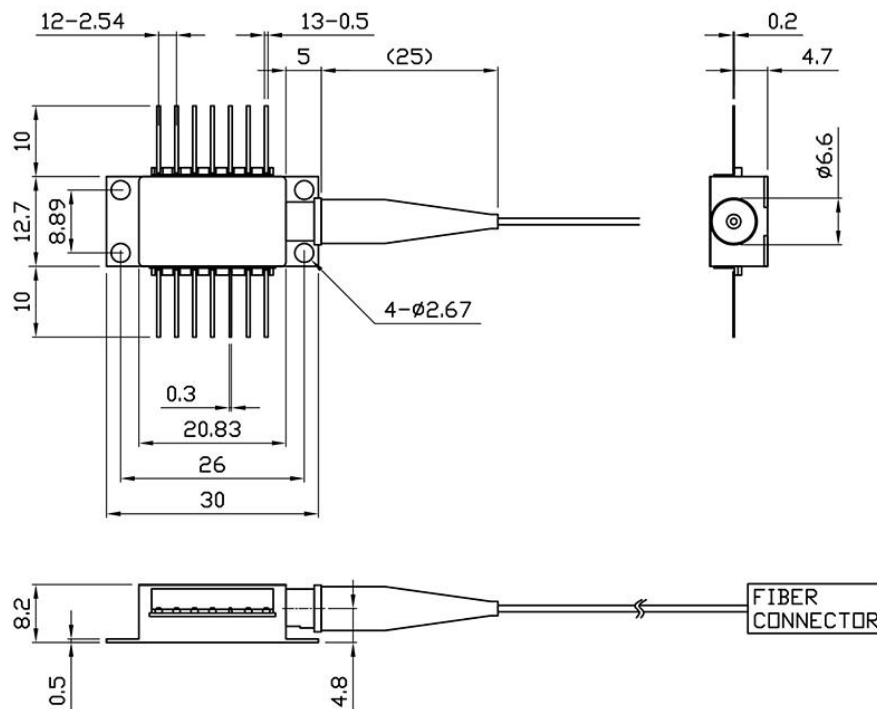
## ● Application area

CPT atomic clock、 Optical coherence experiments

## ● Core parameters

Operating wavelength	Optical power Power
850nm	0.1mW

## ● Dimension Drawing



## ● General Parameters

### Parameter

Parameter	Symbol	Condition	Min.	Typical	Max.	Unit
Optical power	P	—	0.1	—	—	mW
Threshold current	$I_{TH}$	CW, $T_L=25^\circ\text{C}$	1	3	5	mA
Drive current	$I_{op}$	$P_o=0.1\text{mW}$	—	5	8	mA
Laser forward voltage	$V_{LF}$	$P_o=0.1\text{mW}$	—	—	2.3	V
Photoelectric efficiency	$\eta$	CW, $T_L=25^\circ\text{C}$	0.2	0.4	0.65	mW/mA
Laser TEC control temperature (ambient temperature 25°C)	$T_{LD}$	—	15	—	35	°C
Thermistor current	$I_{TC}$	—	10	—	100	μA



Parameter	Symbol	Condition	Min.	Typical	Max.	Unit
Thermistor impedance	$R_{TH}$	$T_L=25^{\circ}C$	9.5	—	10.5	k $\Omega$
Cooler current	$I_{TEC}$	$T_L=25^{\circ}C,$ $T_{around}=70^{\circ}C$	—	—	1.2	A
Cooler voltage	$V_{TEC}$	$T_L=25^{\circ}C, T_{around}=70^{\circ}C$	—	—	3.5	V

## Fiber and connector

Parameter	Symbol	Describe	Min.	Typical	Max.	Unit
Pigtail length	L	Nufern PM 780-HP	0.98	-	3.5	m
Connector type	-	FP/APC		-	3.5	—

## Optical characteristic

Parameter	Symbol	Describe	Min.	Typical	Max.	Unit
wavelength	$\lambda_c$	CW	840	850	860	nm
		TLD=25~35 $^{\circ}C$				
SMSR	-	CW	10	-	-	dB
Extinction ratio	ER	$I_F=5mA$	18	20	-	dB
		Polarization II slow axis				

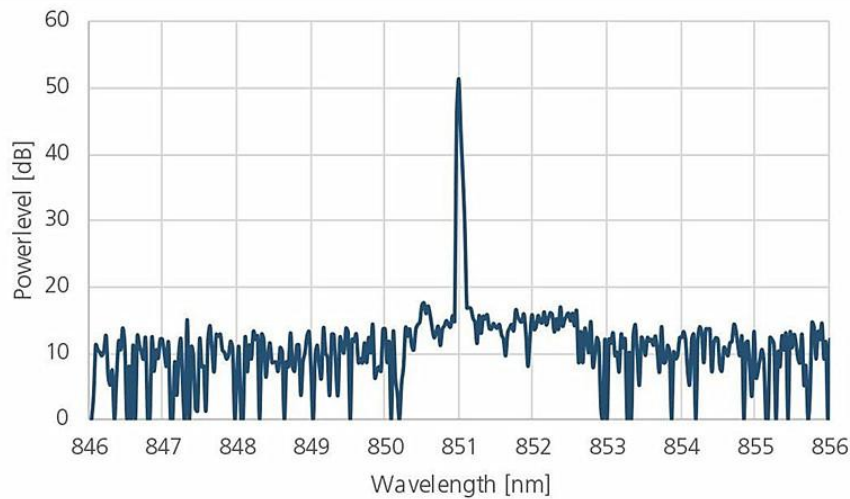
## Absolute Maximum

Parameter	Symbol	Min.	Max.	Unit
Laser reverse voltage	VRLMAX	—	8.0	V
Forward current	$I_{FLMAX}$	—	8.0	mA
Operating temperature range	$T_o$	5	45	°C
Storage temperature range	$T_{stg}$	-40	85	°C
Thermistor temperature	—	—	100	°C
Cooler operating current	—	—	1.9	A



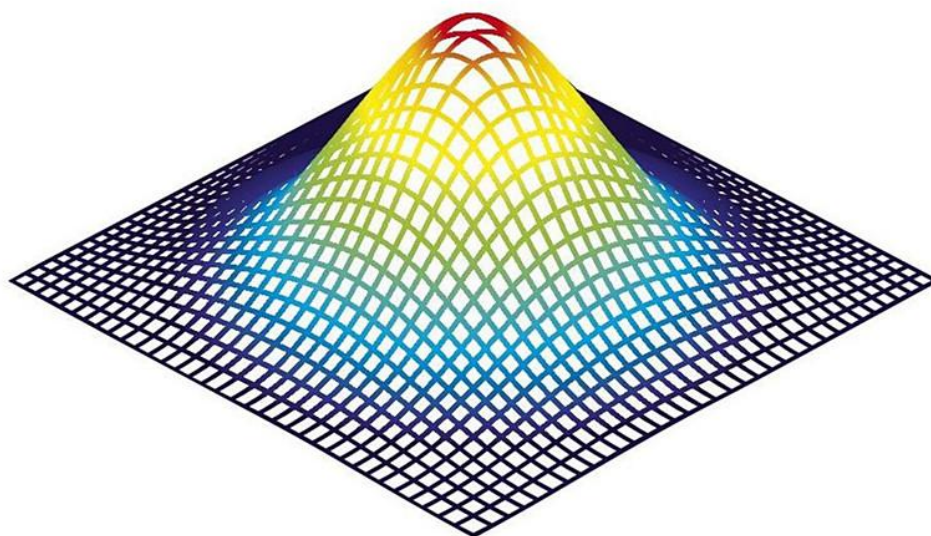
## Spectrum

High-order modes are strongly suppressed and the spectral bandwidth is extremely narrow



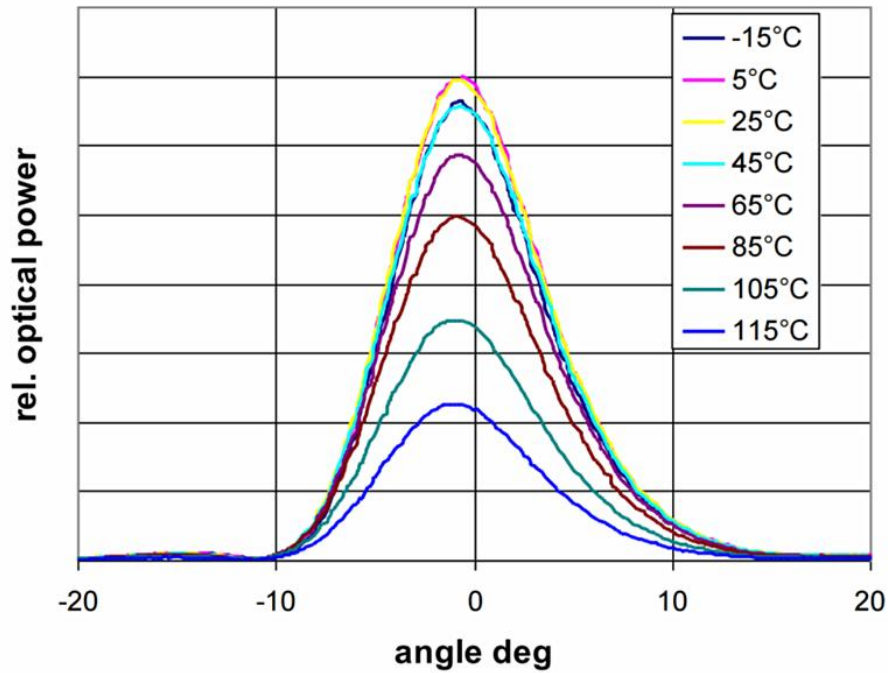
## Beam profile

The far-field light intensity distribution of a single-mode VCSEL is completely consistent with the Gaussian model

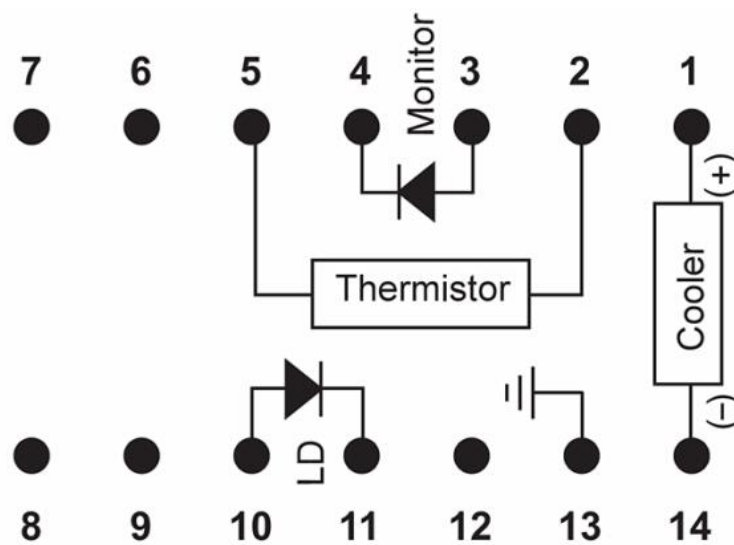


## LIVT characteristic curves

You will benefit from linear performance over a wide temperature range and low threshold current



## Pin definition





1	Thermoelectric Cooler (+)	8	N/C
2	Thermistor	9	N/C
3	PD Monitor Anode (-) optional	10	laser Anode (+)
4	PD Monitor Cathode (+) optional	11	Laser Cathode (-)
5	Thermistor	12	N/C
6	N/C	13	Case Ground
7	N/C	14	Thermoelectric Cooler (-)

**A. Model: MP-VCS-850-0.1-14BF-PA-TEC**

**Description:**

**Center wavelength: 850nm, wavelength deviation:  $\pm 10$ nm, output**

**power: >0.1mw, 14pin butterfly package, polarization-maintaining output**