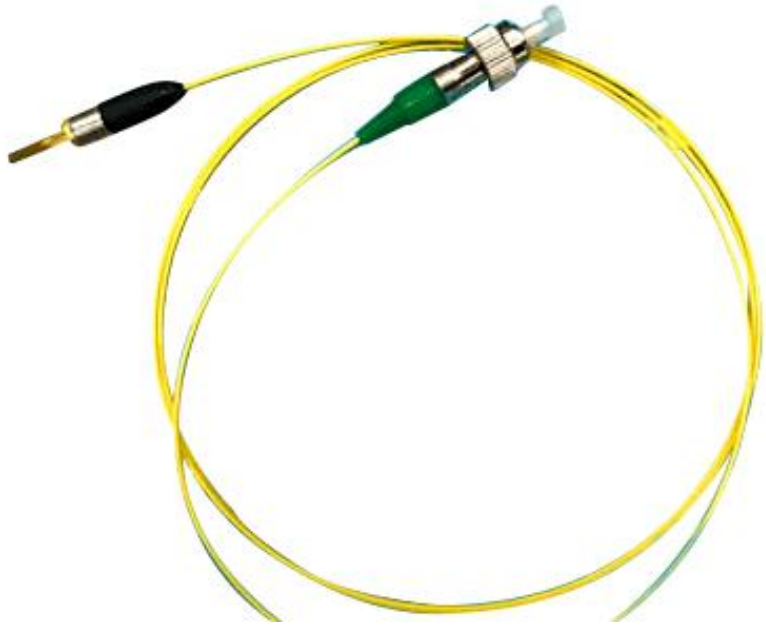
850nm single mode fiber-coupled VCSEL laser diode (with TEC)



Product Description

850nm VCSEL is a vertical emitting MOVPE grown GaAsP/AlGaAs single mode diode laser. Wavelength tuning can be achieved by laser current and temperature tuning. Built-in TEC and thermistor. Our 850 nm single mode VCSEL is designed for high speed, high performance communication applications.

Product features

Low temperature dependence of electrical and optical properties、 Vertical cavity surface emitting laser、 Internal TEC and thermistor, ESD protection、 Narrow line width、 2nm tunable

Part Number

MP-VCS-FC-850-1-SA-TEC

Application area

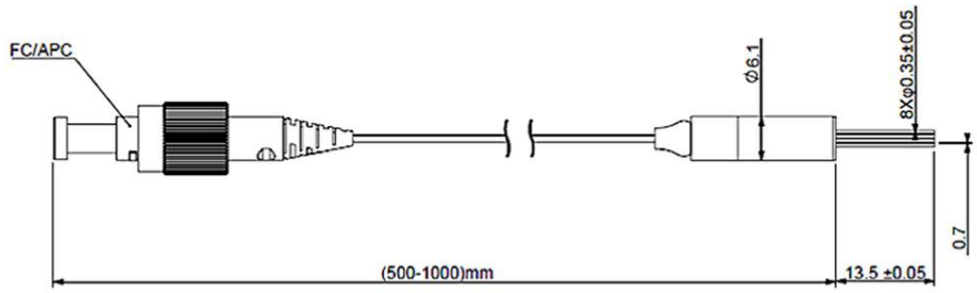
Long distance telephone access network、 Local area network、 Ethernet

Core parameters

Wavelength	Output Power	Spectral Width
850nm	1mW	100MHz

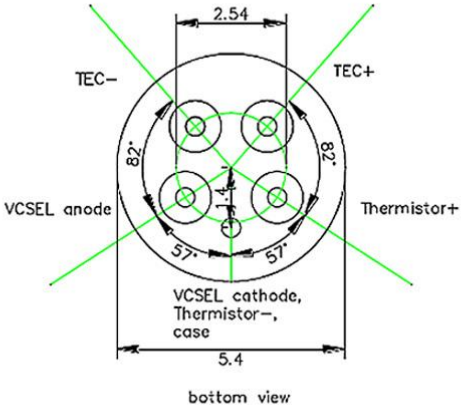
- **Dimension Drawing**

Packing size:



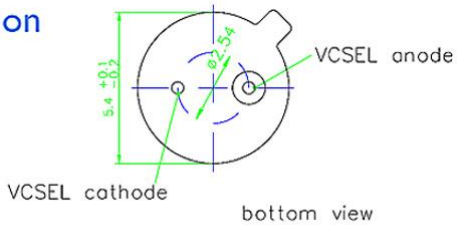
Pin definition

With TEC pin assignment



Without TEC pin assignment

Pin configuration



General Parameters

Parameters

Conditions: T_{OP} = 20°C, I_{OP} = 10.0 mA unless otherwise stated (T_{OP} = chip backside temperature, controlled by TEC)

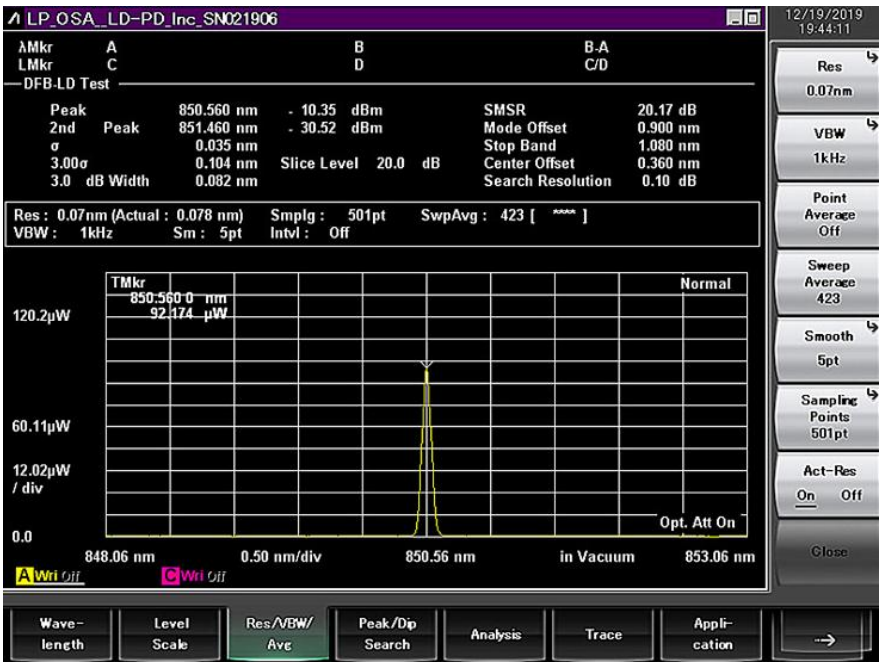
Parameter	symbols	Min.	Typical	Max.	Unit	Remarks
Operating wavelength	λ_R		850nm			
Threshold current	I_{TH}		1		mA	
Output power	P_{opt}	0.5	1		mW	
Threshold voltage	U_{TH}		1.8		V	
Operating current	I_{OP}		3		mA	P_{opt} = 0.5mW
Operating voltage	U_{OP}		3		V	P_{opt} = 0.5 mW
Photoelectric conversion rate	η_{WP}		12		%	P_{opt} = 0.5 mW
Slope efficiency	η_S		0.3		W/A	
Rise and fall time	T_r/T_f		90/120		Psec	
Differential series resistance	R_S		100	200	Ω	P_{opt} = 0.5 mW
3dB modulation bandwidth	v3dB	0.10	2.5		GHz	P_{opt} = 0.5 mW Due to ESD protection diode
Relative noise intensity	RIN		-130	-120	dB/Hz	P_{opt} = 0.3 mW @ 1 GHz
Wavelength current tuning coefficient			0.6		nm/mA	
Wavelength temperature tuning coefficient			0.06		nm/K	
Thermistor (VCSEL chip)	$R_{thermal}$	3		5	K/mW	
Side mode suppression ratio(SMSR)		35			dB	I = 2 mA

Parameter	symbols	Min.	Typical	Max.	Unit	Remarks
Beam divergence angle	θ	10		25	°	P_{opt} = 0.5mW, full width 1/e^2
Spectral width			100		MHz	P_{opt} = 0.5 mW

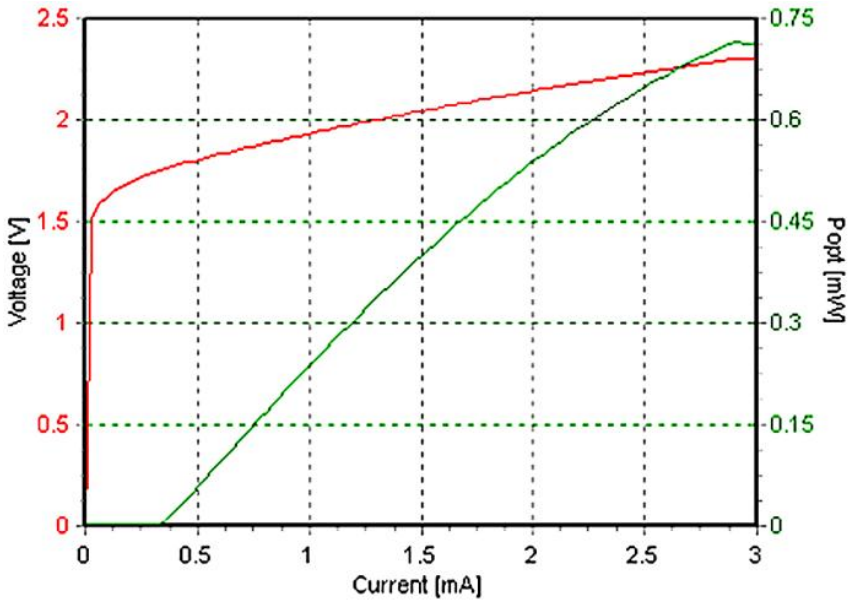
*Above specifications are for device without connectors.

Tec Characteristics	Unit	Min.	Typical value	Max.	Remarks
Tec current	mA	-150(Heating)		+300(Cooling)	Proper Heart Sink Required
NTC Thermistor	KΩ	9.5	10.0	10.5	T=25°C@10 KΩ
NTC Thermistor	KΩ	10/exp{3892-(1/289K-I/TOP)}			

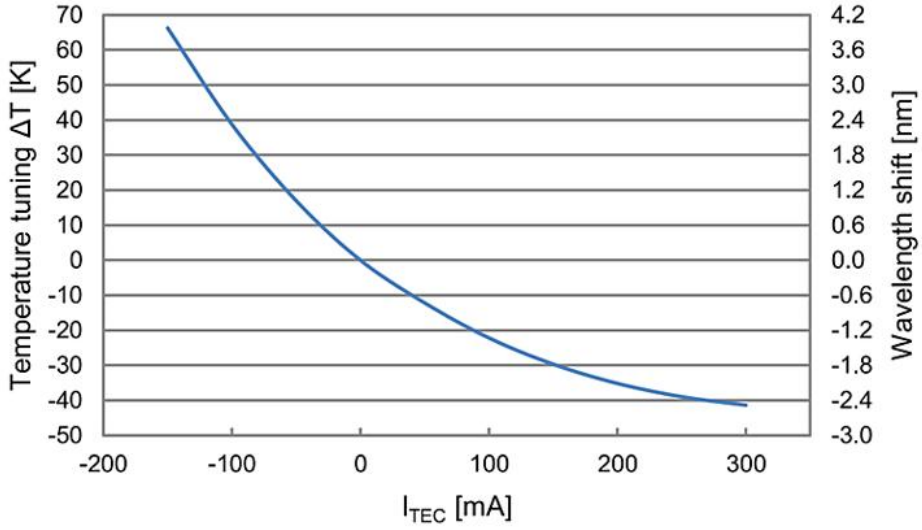
Spectrum



L-I Curve (T@25°C)

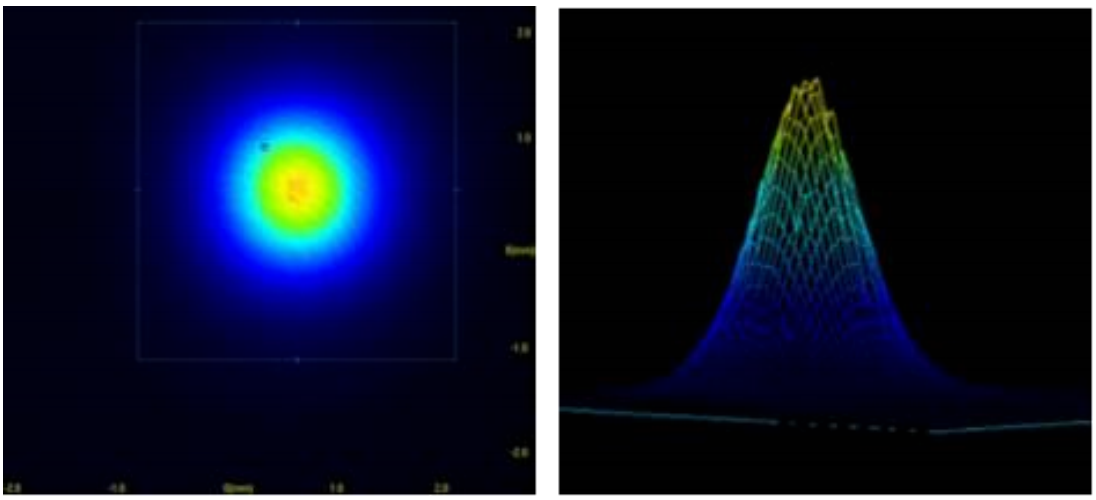


Temperature/wavelength tuning curve @TEC current:



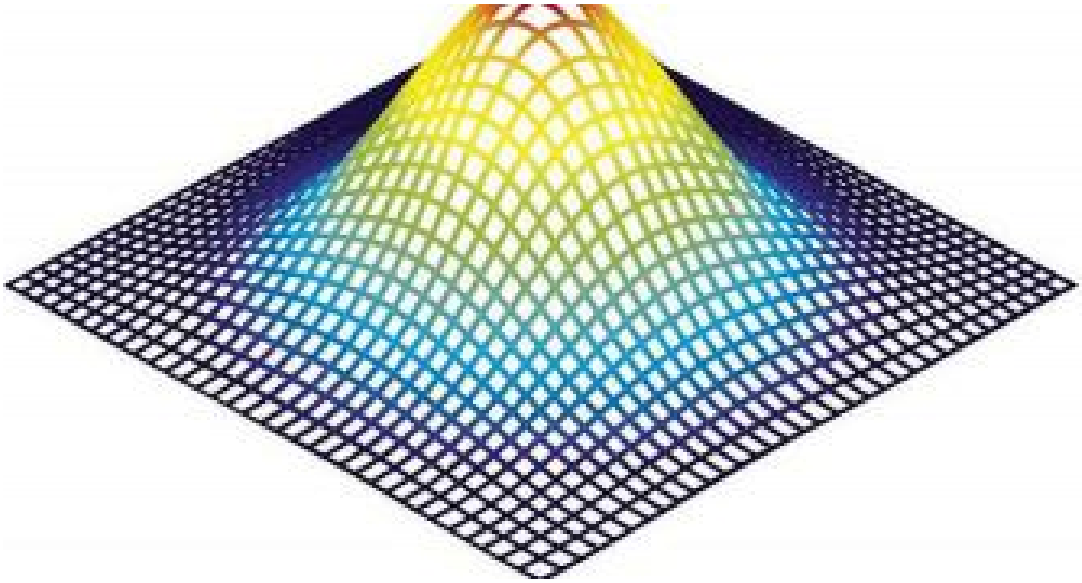
* TEC performance is dependent on heat load, ambient temperature and heatsink properties

Laser spot image (2D/3D):



Beam Profile

In the far field, the intensity distribution of a single-mode VCSEL is a perfect Gaussian shape.



Absolute Maximum Parameters

Parameter	Unit	Min.	Typical value	Max.
Storage temperature	℃	-40	25	125
Chip temperature	℃	+10	25	40
Operating current	mA	0	3.0	5.0
Forward voltage	V	0.8	3.0	4.8
TEC current	mA	-150	-	+300
Soldering temperature*	℃	100	130	260
Power consumption	mw	-	-	5

(*TEC temperature must be below 150℃)

Ordering information

MP-VCS-□□□□-☆-A8▽-XX

□□□□: Wavelength

0760: 760nm

0850: 850nm

*****

1550: 1550nm

☆ : TEC

0: Without TEC

1：With TEC

▽：Wavelength Tolerance

1：±0.5nm

2：±1.5nm

XX: Fiber and Connector Type

FS=Free Space

BFSA=Butterfly Package with HI780+ FC/APC

CPSA=Coaxial Package with HI780+ FC/APC

BFSP=Butterfly Package with HI780+ FC/PC

CPSP=Coaxial Package with HI780+ FC/PC

BFPP=PM Fiber+ FC/PC PA=PM Fiber+ FC/APC