



VCC-94A5H 940nm 4.7mW VCSEL Chip

Description

The Lasermate VCC-94A5H is a 940nm wavelength, 4.7mW output power, Vertical Cavity Surface Emitting Laser (VCSEL) chip designed for use in sensing applications.

Features

- 940nm single emitter VCSEL chip
- Typical 4.7mW output power at 9mA
- Chip size: 175 x 175um
- Multi-mode beam profile
- -20 to 85°C operating temperature

Applications

- Sensor light source
- Consumer electronics

Specifications

Absolute Maximum Ratings					
Parameters	Symbol	Rating	Unit	Conditions	
Storage Temperature	T_{stg}	-40 to 150	°C		
Operating Temperature	T_{op}	-20 to 85	°C		
Maximum CW Current		15	mA		
Human Body Model		300	V		
Machine Model		50V	V		
Maximum package SMT solder reflow temperature	-	260	°C	10 seconds	

Note: The maximum CW laser current in the Absolute Maximum Ratings is valid for the operating temperature noted at the table above. Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device.

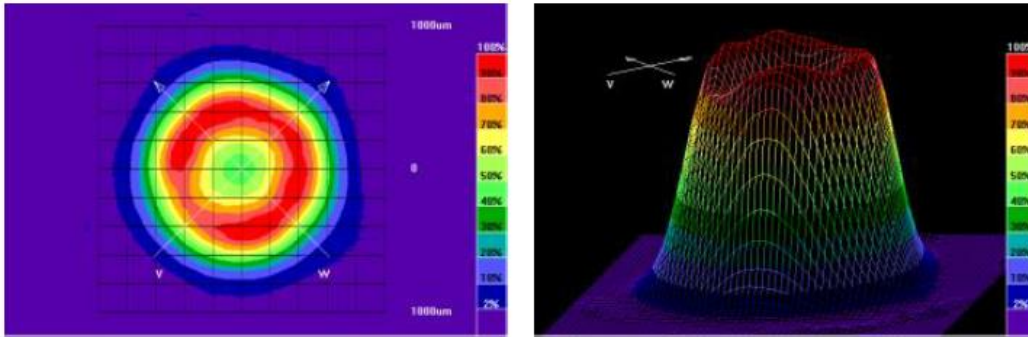
Electro-Optical Characteristics ($T_a=25^\circ\text{C}$ unless otherwise stated)						
Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold Current	I_{th}	1	2	3	mA	
Slope Efficiency	η	0.5	0.67	0.9	W/A	$I_f=9\text{mA}$
Optical Output Power	P_o	4.0	4.7	5.4	mW	$I_f=9\text{mA}$
Center Wavelength	λ_c	930	940	950	nm	$I_f=9\text{mA}$
Beam Divergence	Θ	22	24	28	°	$I_f=9\text{mA}$, Full Width $1/e^2$
Operating Voltage	V_f	1.7	1.9	2.1	V	$I_f=9\text{mA}$

Notes:

- Forward Voltage (V_f) measurement allowance is $\pm 0.1\text{V}$.
- Center Wavelength (λ_c) measurement allowance is $\pm 1.5\text{nm}$.
- Others measurement allowance is $\pm 5\%$.
- All parameters except mentioned are measured at $I_f=9\text{mA}$, $T_a=25^\circ\text{C}$, CW.

Typical Characteristics

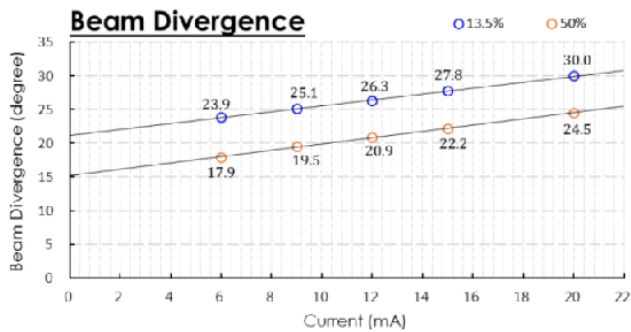
Beam Divergence (Measured at 9mA)



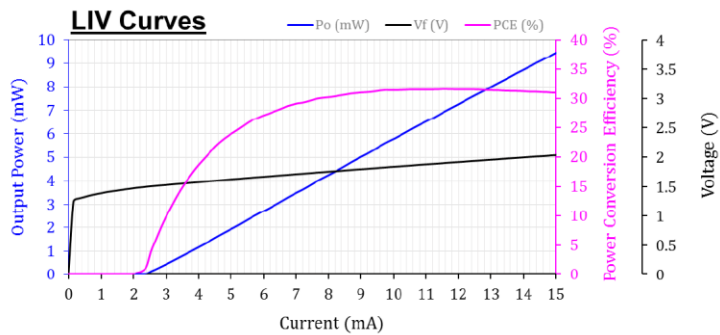
Full Width $1/e^2$: 25 degrees (average)

Notes:

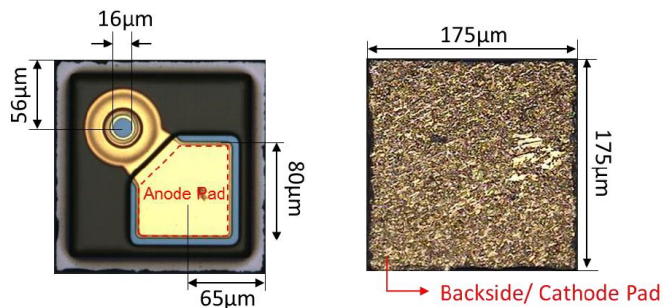
- Test package sample: VCSEL on a TO-can package (TO-46).
- Full angle of 13.5% ($=1/e^2$) peak intensity.
- Full width at half maximum (FWHM) of 50% peak intensity.



LIV Graph at 25°C



Outline Dimensions (unit: μm)



Specification	Unit	Min.	Typ.	Max.	Condition
Number of emitters	ea		1		
Length (X), Width (Y)	μm	160	175	190	
Thickness	μm	135	150	165	
Emitter surface area diameter	μm	-	16	-	
Anode pad size (Bond pad)	μm	77	80	83	Emitter side
Cathode pad size	μm	160	175	190	Backside

Note: Dimension tolerance is $\pm 3\mu\text{m}$ unless specified otherwise.

Additional Notes

- The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation to equipment, take normal ESD precautions when handling this product.
- Specifications are subject to change without notice.