



VCC-85A4WH 850nm 4000mW VCSEL Chip

Description

The Lasermate VCC-85A4WH is an 850nm wavelength, 4000mW output power, multi-emitter, Vertical Cavity Surface Emitting Laser (VCSEL) chip designed for use in sensing applications.

Features

- 850nm multi-emitter VCSEL chip
- Typical 4W peak pulse output at 4.5A
- High PCE (Power Conversion Efficiency): 42%
- -20 to 85°C operating temperature
- Number of emitters: 977
- Chip size: 1400 x 1488 ± 15 μm
- Electrode side: Gold alloy on both anode P (emission side) and cathode N (backside)

Applications

- Sensing light source
- IR illumination
- 3D sensing
- 3D imaging, Time of Flight (TOF), Structure light, Iris/Facial recognition, etc.

Specifications

Absolute Maximum Ratings				
Parameters	Symbol	Rating	Unit	Conditions
Storage Temperature	T_{stg}	-40 to 85	°C	
Operating Temperature	T_{op}	-20 to 85	°C	
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.

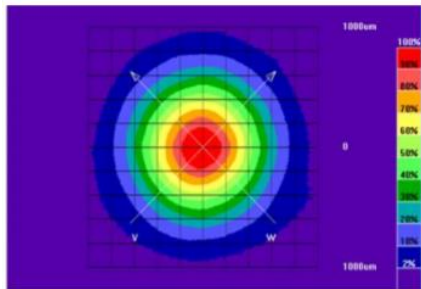
Electro-Optical Characteristics ($T_a=25^\circ\text{C}$ unless otherwise stated)						
Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold Current	I_{th}		800		mA	
Slope Efficiency	η	0.9	1.08		W/A	$I_f=4.5\text{A}$
Optical Output Power	P_o		4		W	$I_f=4.5\text{A}$
Center Wavelength	λ_c	840	850	860	nm	$I_f=4.5\text{A}$
Power Conversion Efficiency	PCE		42		%	$I_f=4.5\text{A}$
Beam Divergence	θ		25		°	Full width $1/e^2$
Operating Voltage	V_f	1.7	2.1	2.3	V	$I_f=4.5\text{A}$
Rise Time (20%~80%)	T_r		500		ps	$I_f=4.5\text{A}$
Fall Time (20%~80%)	T_f		500		ps	$I_f=4.5\text{A}$
Wavelength Shift	$\Delta\lambda/\Delta T$		0.07		nm/°C	$I_f=4.5\text{A}$

Notes:

- Forward Voltage (V_f) measurement allowance is ±0.1V.
- Center Wavelength (λ_c) measurement allowance is ±1.5nm.
- Others measurement allowance is ±10%.
- Test DUTs are mounted on star board and measured with operating bias current @ 4.5A, Duty Cycle: 1%.

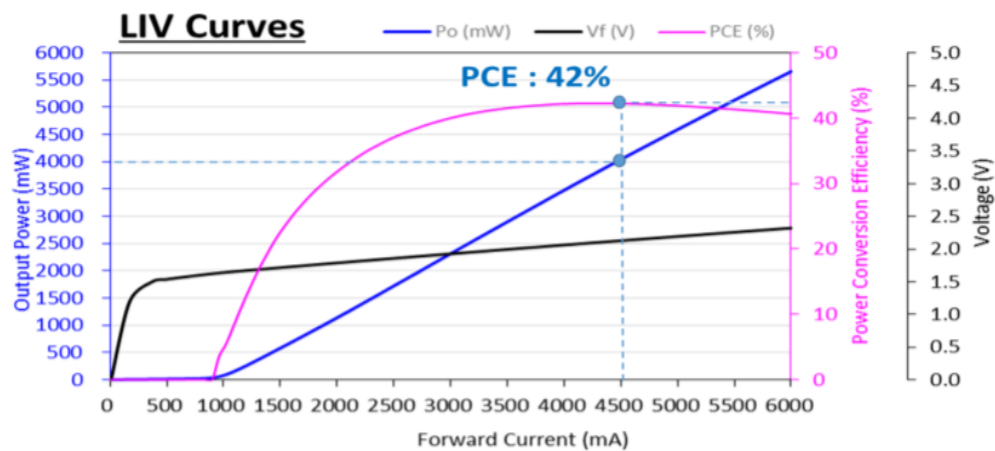
Typical Characteristics

Beam Divergence



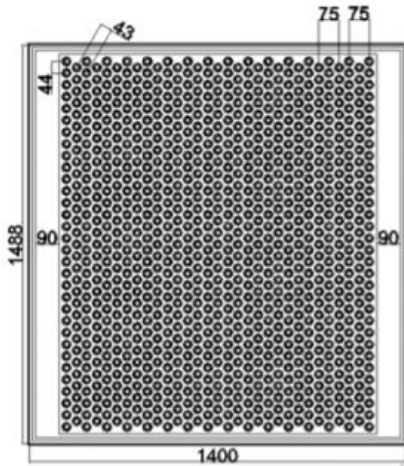
Full Width $1/e^2$: 25°

LIV Graph at 25°C



Note: Curves measurement at 0 ~ 6A current sweep with 1% duty cycle.

Outline Dimensions (unit: μm)



Specification	Min.	Typ.	Max.
Chip width	1385	1400	1415
Chip length	1473	1488	1503
Chip thickness	105	120	135
Bond pad width	-	90	-

Notes:

- Abnormal Aperture allowable is 1%.
- Continuous abnormal aperture (x, y or diagonal direction) is not allowed.

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.