



## VCC-85A1WH 850nm 1000mW VCSEL Chip

### Description

The Lasermate VCC-85A1WH is an 850nm wavelength, 1000mW output power, multi-emitter, Vertical Cavity Surface Emitting Laser (VCSEL) chip designed for use in sensing applications.

### Features

- 850nm multi-emitter VCSEL chip
- Typical 1W peak pulse output at 1.2A
- Number of emitters: 202
- High PCE (Power Conversion Efficiency): >38%
- -20 to 85°C operating temperature
- Chip size: 666 x 797 ± 15 μm
- Chip thickness: 120 ± 15 μm
- Electrode side: Gold alloy on both anode P (emission side) and cathode N (backside)

### Applications

- Sensing light source
- Photoelectric sensors
- Optical encoders
- 3D sensing
- 3D imaging, including Time of Flight, Structure light, Iris/Facial recognition, etc.

### Specifications

Absolute Maximum Ratings				
Parameters	Symbol	Rating	Unit	Conditions
Storage Temperature	T <sub>stg</sub>	-40 to 85	°C	
Operating Temperature	T <sub>op</sub>	-20 to 85	°C	
Continuous Forward Current	I <sub>f</sub>	1300	mA	
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.

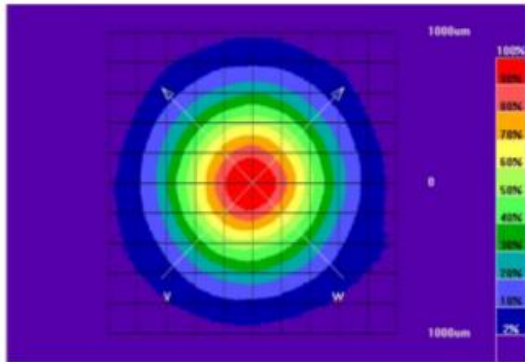
Electro-Optical Characteristics (T <sub>a</sub> =25°C unless otherwise stated)						
Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold Current	I <sub>th</sub>		180	300	mA	
Slope Efficiency	η	0.9	1.0		W/A	I <sub>f</sub> =1.2A
Optical Output Power	P <sub>o</sub>		1000		mW	I <sub>f</sub> =1.2A
Center Wavelength	λ <sub>c</sub>	840	850	860	nm	I <sub>f</sub> =1.2A
Power Conversion Efficiency	PCE	38	43		%	I <sub>f</sub> =1.2A
Beam Divergence	Θ		24		°	Full width 1/e <sup>2</sup>
Forward Voltage	V <sub>f</sub>	1.7	2.0	2.3	V	I <sub>f</sub> =1.2A
Wavelength Shift	Δλ/ΔT		0.07		nm/°C	I <sub>f</sub> =1.2A

#### Notes:

- Forward Voltage (V<sub>f</sub>) measurement allowance is ±0.1V.
- Center Wavelength (λ<sub>c</sub>) measurement allowance is ±1.5nm.
- Others measurement allowance is ±10%.
- Test DUTs are mounted on star board and measured with operating bias current @ 1.2A, Duty Cycle: 10%.

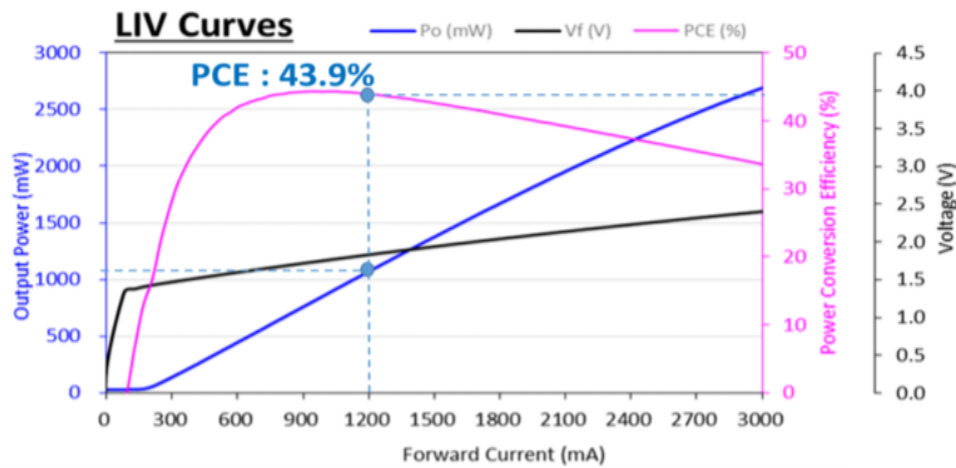
## Typical Characteristics

### Beam Divergence



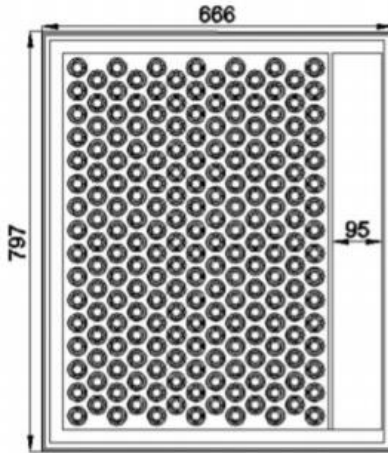
Full Width  $1/e^2$  :  $24^\circ$

### LIV Graph at 25°C



Note: Curves measurement at 0 ~ 3A current sweep with 10% duty cycle.

### Outline Dimensions (unit: $\mu\text{m}$ )



Specification	Min.	Typ.	Max.
Chip width	651	666	681
Chip length	782	797	812
Chip thickness	105	120	135
Bond pad width	-	95	-

### 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.