

# 940nm 4000mW VCSEL Chip

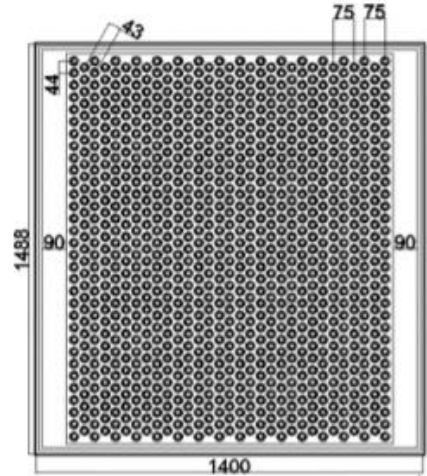
Part No. VCC-94A4WH

## Features

- 940nm VCSEL chip
- Typical 4W peak pulse output at 4.7A
- High PCE (Power Conversion Efficiency): Typical 40%
- -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
- Time of Flight (TOF), Structure light, Iris/Facial recognition, etc.



## Specifications

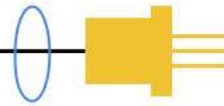
Absolute Maximum Ratings				
Parameters	Symbol	Rating	Unit	Conditions
Storage Temperature	T <sub>stg</sub>	-40 to 85	°C	
Operating Temperature	T <sub>op</sub>	-20 to 85	°C	
Maximum package SMT solder reflow temperature	-	260	°C	10 seconds

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>		800		mA	
Slope Efficiency	η	0.85	1.0		W/A	I <sub>f</sub> =4.7A
Optical Output Power	P <sub>o</sub>		4000		mW	I <sub>f</sub> =4.7A
Center Wavelength	λ <sub>c</sub>	930	940	950	nm	I <sub>f</sub> =4.7A
Power Conversion Efficiency	PCE		40		%	I <sub>f</sub> =4.7A
Beam Divergence	Θ		27		°	Full width 1/e <sup>2</sup>
Operating Voltage	V <sub>f</sub>	1.7	2.1	2.3	V	I <sub>f</sub> =4.7A
Rise Time (20%~80%)	T <sub>r</sub>		500		ps	I <sub>f</sub> =4.5A
Fall Time (20%~80%)	T <sub>f</sub>		500		ps	I <sub>f</sub> =4.5A
Wavelength Shift	Δλ/ ΔT		0.07		nm/°C	I <sub>f</sub> =4.7A

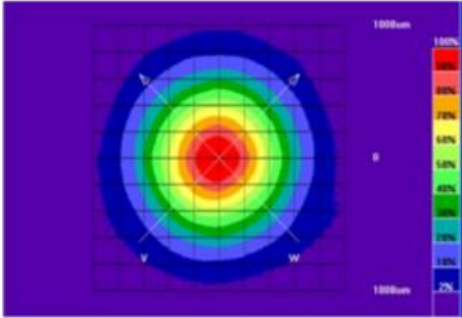
Notes:

- 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 @ 4.7A, Duty Cycle: 1%.



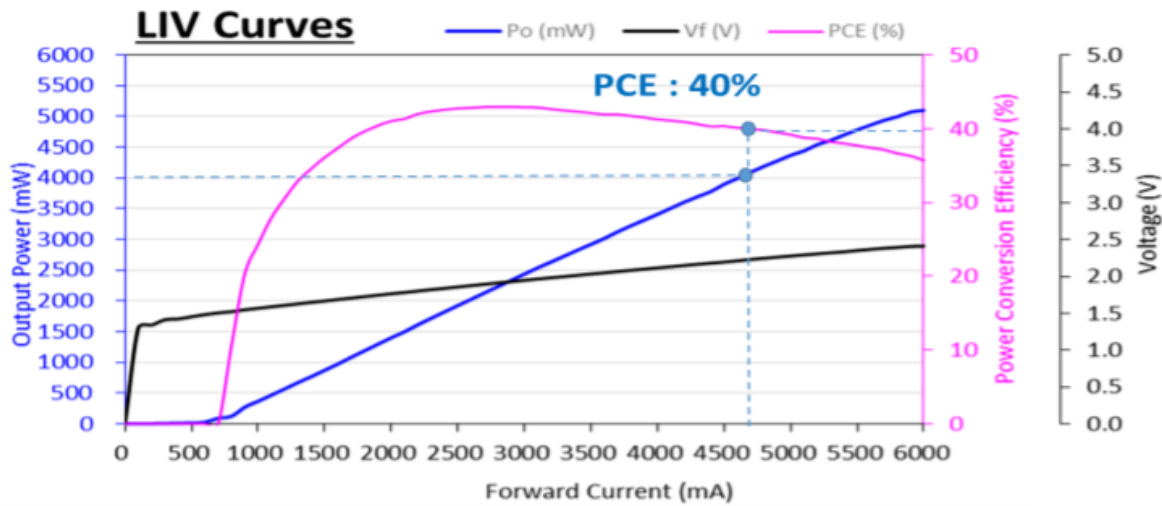
**Typical Characteristics**

**Beam Divergence**



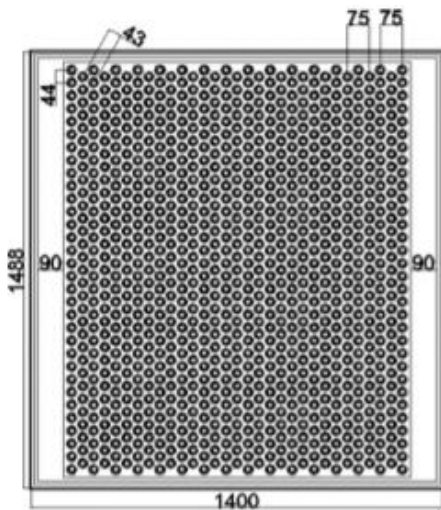
Full Width 1/ e<sup>2</sup> : 27°

**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	-

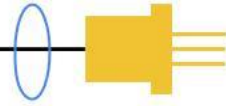
Notes:

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



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**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.

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