



940nm 5mW VCSEL Chip

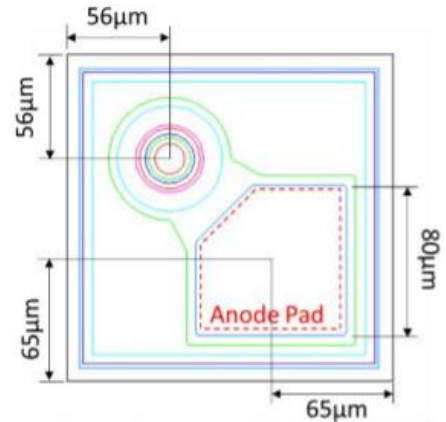
Part No. VCC-94A5H

Features

- 940nm 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	
Junction Temperature	T _j	≤ 80	°C	
Forward Current	I _f	15	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 _a =25°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 =9mA
Optical Output Power	P _o	4.0	4.7	5.4	mW	I _f =9mA
Center Wavelength	λ _c	930	940	950	nm	I _f =9mA
Beam Divergence	Θ	22	25	28	°	I _f =9mA, Full Width 1/e ²
Operating Voltage	V _f	1.7	2.0	2.3	V	I _f =9mA
Wavelength Shift	Δλ/ ΔT		0.07		nm/°C	I _f =9mA
ESD Threshold	V _{ESD}			300	V	Human body model

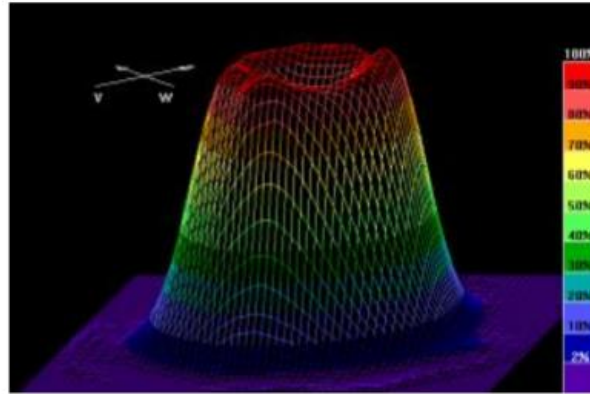
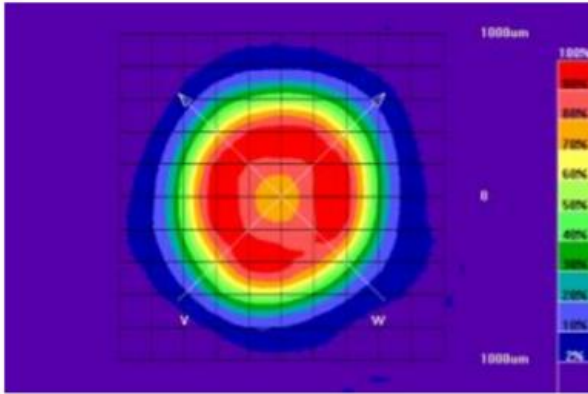
Notes:

- Forward Voltage (V_f) measurement allowance is ±0.1V.
- Center Wavelength (λ_c) measurement allowance is ±1.5nm.
- Others measurement allowance is ±5%.
- All parameters except mentioned are measured at I_f=9mA, T_a=25°C, CW.



Typical Characteristics

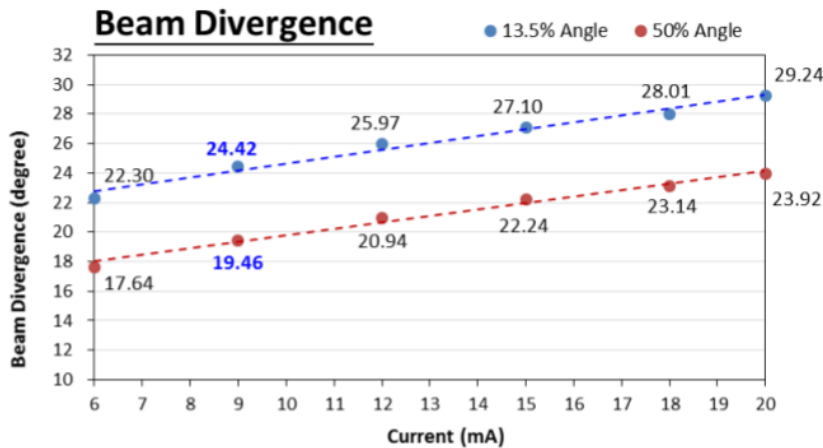
Beam Divergence (Measured at 9mA)



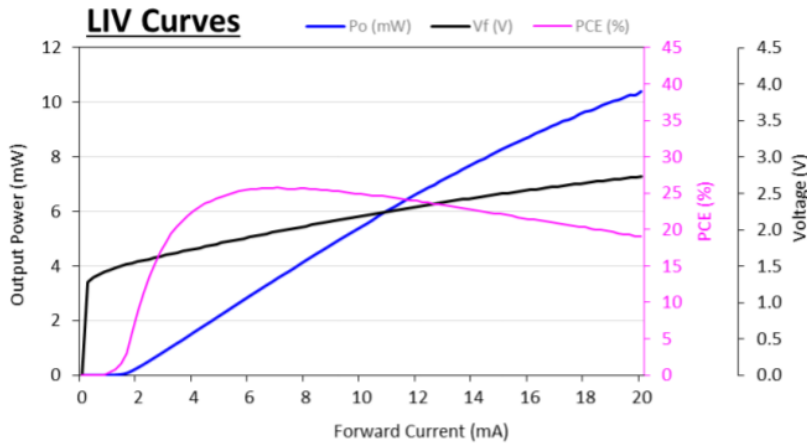
Full Width 1/e²: 25 degrees (average)

Notes:

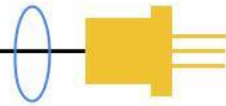
- All parameters except mentioned are measured at T_a=25°C, CW.
- Test package sample: VCSEL on a TO-can package (TO-46).
- Full angle of 13.5% (=1/e²) peak intensity.
- Full width at half maximum (FWHM) of 50% peak intensity.



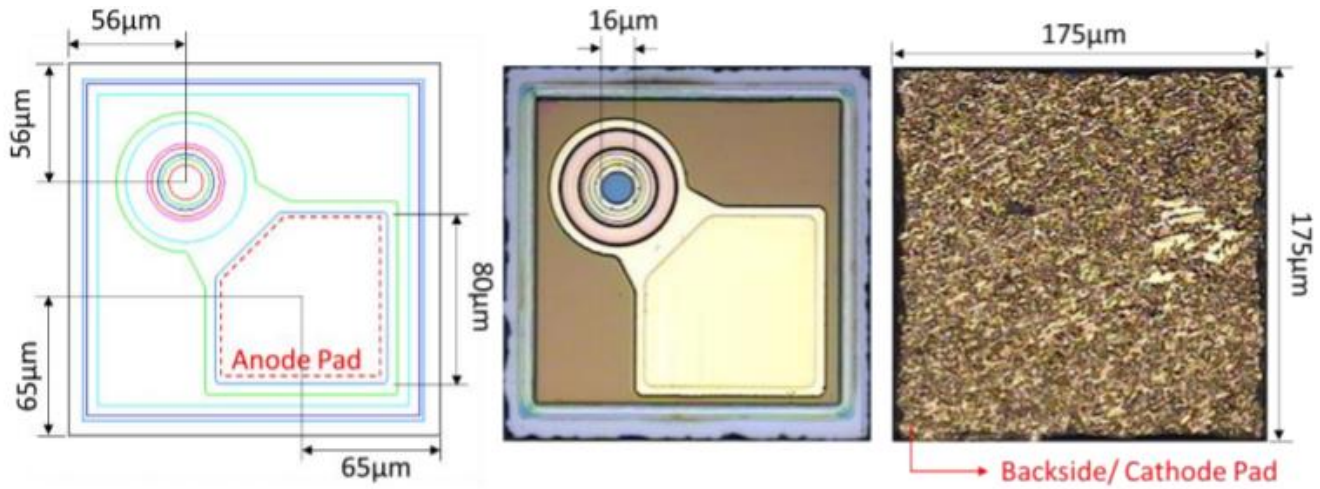
LIV Graph at 25°C



Note: Data measure at ambient temperature 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	-	80	-	Emitter side
Cathode pad size	μm	160	175	190	Backside

Note: Chip backside cathode pad is the same as chip size.

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.