

Data Sheet(Preliminary)

VCSEL single emitter chip

940nm 50mW 3J R01

Dogain Core Optoelectronic Technology(Suzhou)Co.,Ltd

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Rev. R01

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Note: Customers represent that they have all the necessary expertise to create and implement their own safeguards that anticipate dangerous failures, monitor failures and their consequences, lessen the likelihood of dangerous failures and take appropriate remedial actions.

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Product Introduction

Performance characteristics

- **High output power** : Output optical power is 47mW on QCW with heatsink temperature 50°C.
- **Multimode output** : The laser operates at 940nm.
- **Low power consumption, high photoelectric conversion efficiency** :47% Power Conversion Efficiency (PCE) at 50°C.
- **Donut far-field** : divergence angle 45 degrees.
- **Other wavelengths, chip dimensions, and emitter patterns are available according to customer request.**

Application

- Consumer electronics
- Machine vision
- Infrared illumination
- Industrial applications

Electro-optical characteristics (50°C)

Parameters	Symbol	Min	Typical	Max	Units	Test Condition
Optical Output Power	P _{OP}	40	47	-	mW	Pulse 22mA 50°C
Threshold Current	I _{th}	2	4	6	mA	Pulse 50°C
Operating Current	I _{op}	-	22	-	mA	Pulse 50°C
Differential Resistance	R _s	21	24	28	Ω	Pulse 22mA 50°C
Operating Voltage	V _{op}	4.3	4.6	4.9	V	Pulse 22mA 50°C
Slope Efficiency	η _s	2.4	2.7	-	W/A	Pulse 22mA 50°C
Power Conversion Efficiency	PCE	42	47	-	%	Pulse 22mA 50°C
Wavelength	λ _{peak}	932	940	948	nm	Pulse 22mA 50°C
Full Width at Half Maxima (FWHM)	Δλ	-	-	2.5	nm	Pulse 22mA 50°C
Beam Full Divergence (D86)	φ	42	45	48	°	Pulse 22mA 50°C
Wavelength Coefficient	dλ/dT	-	0.07	-	nm/°C	Pulse

* All tests are under pulse condition on 20μs, 1%D.C. with heatsink temperature 50°C

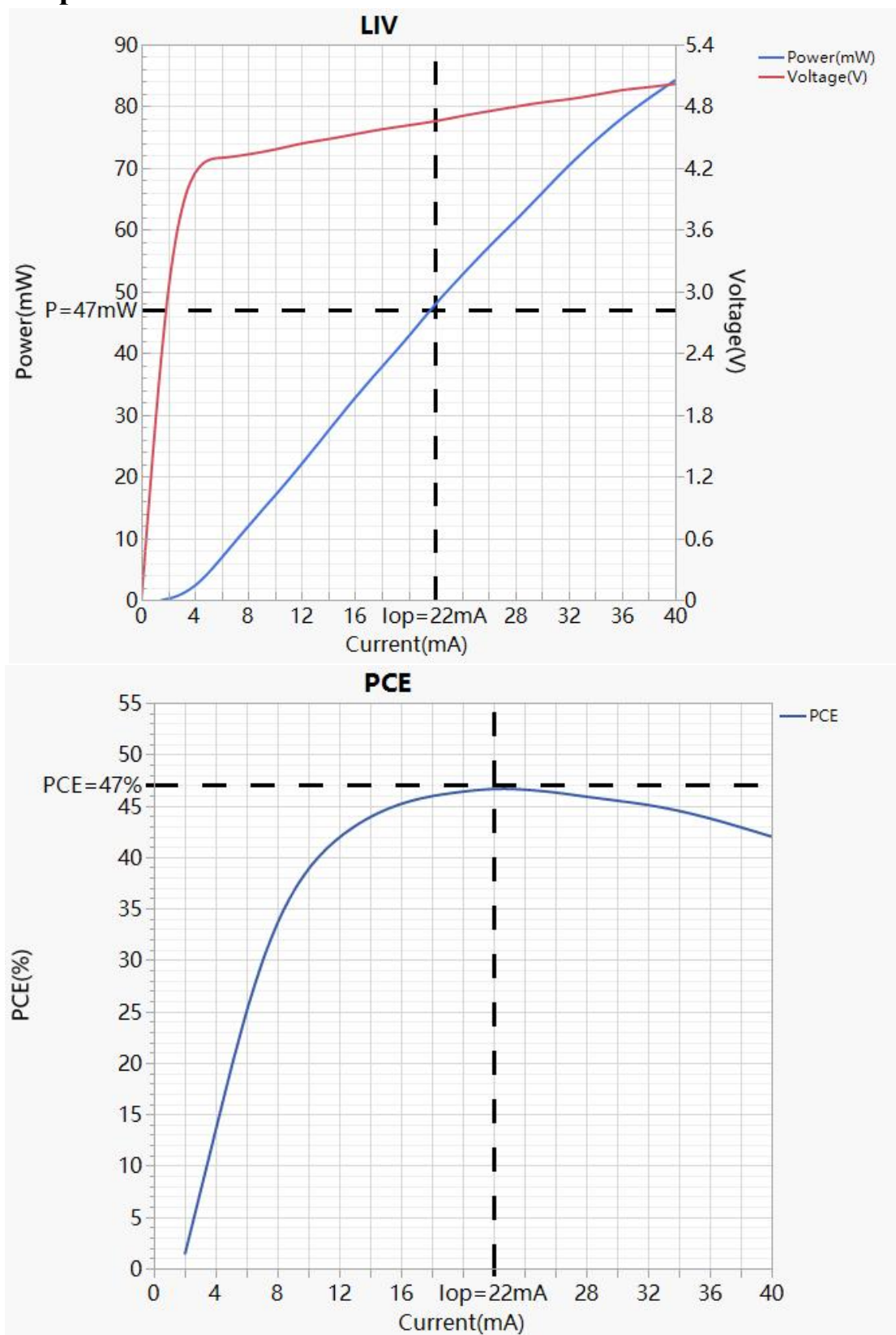
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Electro-optic conversion curve



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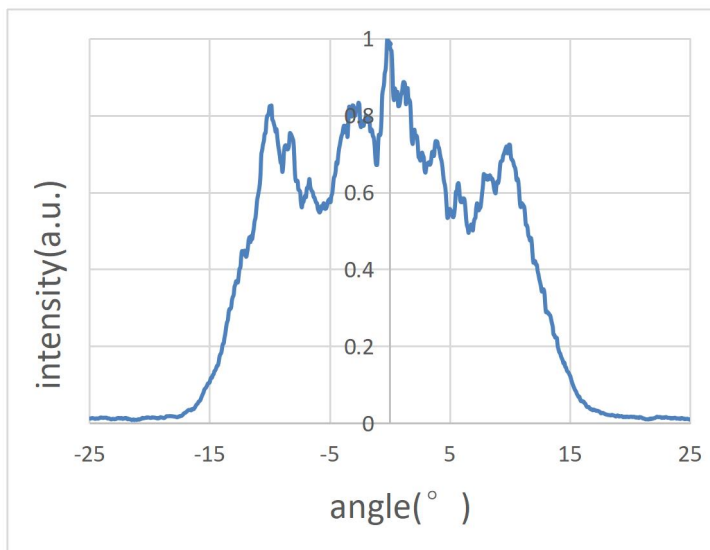
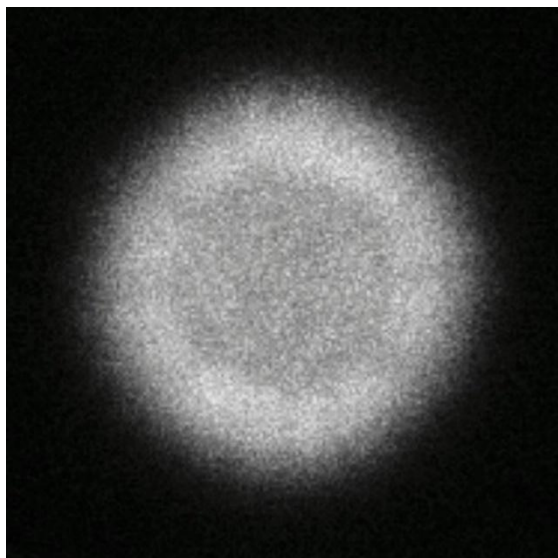
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Far Field profile



Tested at 50°C in pulse mode
(I_{op}=22mA, pulse width: 20μs, pulse duty cycle:1%).

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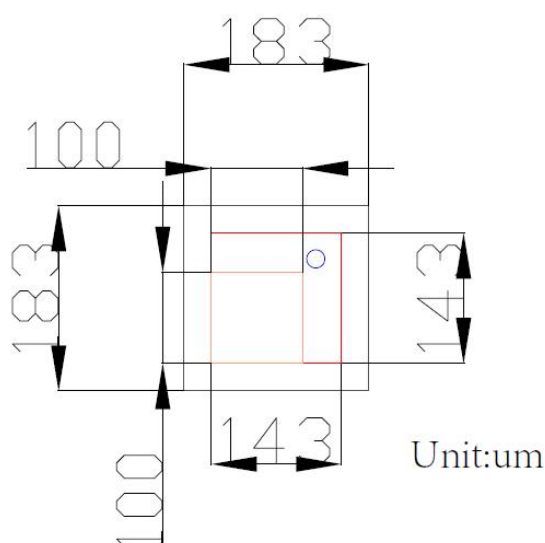
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Product appearance mechanical characteristics

Parameter	Ratings	Units
Number of emitters	1	#
Chip Width	183 ± 20	μm
Chip Length	183 ± 20	μm
Anode Contact	Emission side, Au surface	/
Die Thickness	100 ± 15	μm
Cathode Contact	Backside, Au surface	/



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Operating temperature	Top	-20	85	$^{\circ}\text{C}$
Operating humidity	Hop	0	85	%
Storage temperature	Ts	-40	110	$^{\circ}\text{C}$
Storage humidity	Hs	0	85	%

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Eye safety and disclaimer

Security recommendations

Depending on the usage of the device, the module may emit highly concentrated invisible infrared light that is harmful to the human eye. Products containing these modules may be required to follow the safety precautions specified in IEC 60850-1 and IEC62471.

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Note:

No responsibility is assumed for the use of these products. The products can emit Class I~IV radiation and must be operated with extreme care. Avoid directly viewing the laser beam or exposure to specular reflections. Proper eye wear must be worn at all times when operating. VCSEL Chip in the modules are electrostatic-sensitive device and proper ESD protection is required for handling.



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