

Data Sheet(Preliminary)

VCSEL single emitter chip

940nm 12mW R01

Dogain Core Optoelectronic Technology(Suzhou)Co.,Ltd.

PN: DG-VC-A940-12B01-N

Rev. R01

May. 2026

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.

本文件及其披露的任何数据的所有权均属于度亘核芯光电技术（苏州）股份有限公司，构成并包含专有信息。除非度亘核芯光电技术（苏州）股份有限公司明确书面授权，否则不具有任何接收或拥有本文件授予或转让复制、使用或披露本文件所含任何信息的权利。

DG

REV: R01

商业秘密

Product Introduction

Performance characteristics

- **High output power** : Output optical power is 12.4mW on CW with heatsink temperature 25°C.
- **Multimode output** : The laser operates at 940nm.
- **Low power consumption, high photoelectric conversion efficiency** :35% Power Conversion Efficiency (PCE) at 25°C.
- **Donut far-field** : divergence angle 26 degrees, symmetrical, donut mode.
- **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 (25°C)

Parameters	Symbol	Min	Typical	Max	Units	Test Condition
Optical Output Power	P_{OP}	11.9	12.4	-	mW	CW 15mA 25°C
Threshold Current	I_{th}	-	2.5	-	mA	CW 25°C
Operating Current	I_{op}	-	15	-	mA	CW 25°C
Differential resistance	R_s	40	50	70	Ω	CW 15mA 25°C
Operating Voltage	V_{op}	1.7	2.1	2.5	V	CW 15mA 25°C
Slope Efficiency	η_s	0.9	1	-	W/A	CW 15mA 25°C
Power Conversion Efficiency	PCE	32	35	-	%	CW 15mA 25°C
Wavelength	λ_{peak}	932	940	948	nm	CW 15mA 25°C
Full Width at Half Maxima (FWHM)	$\Delta\lambda$	-	-	2.5	nm	CW 15mA 25°C
Beam Full Divergence (D86)	ϕ	24	26	30	°	CW 15mA 25°C
Wavelength coefficient	$d\lambda/dT$	-	0.07	-	nm/°C	CW

* All tests are under CW condition with heatsink temperature 25°C

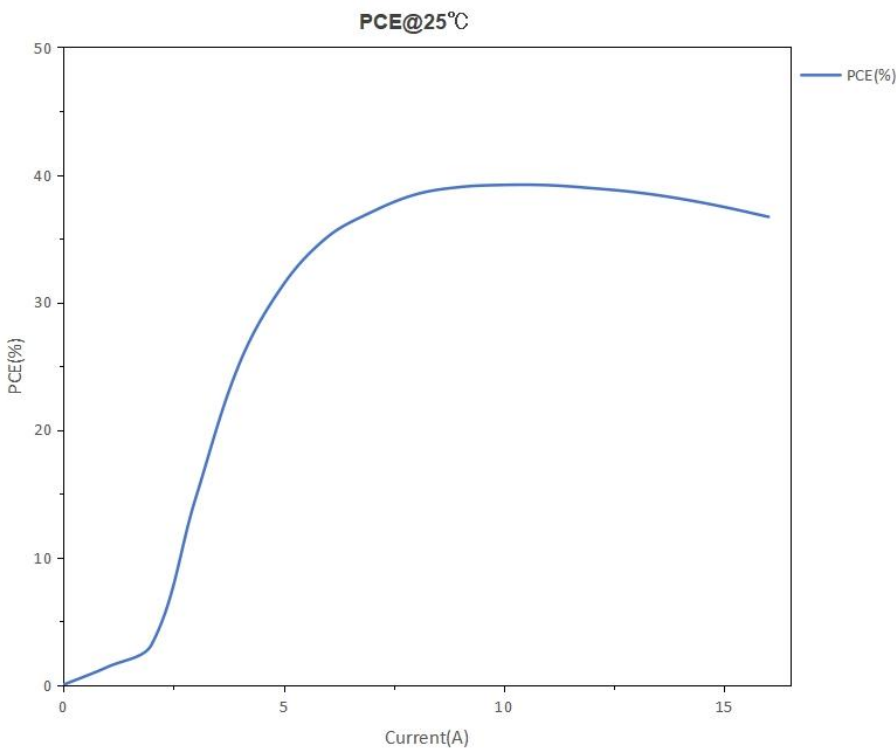
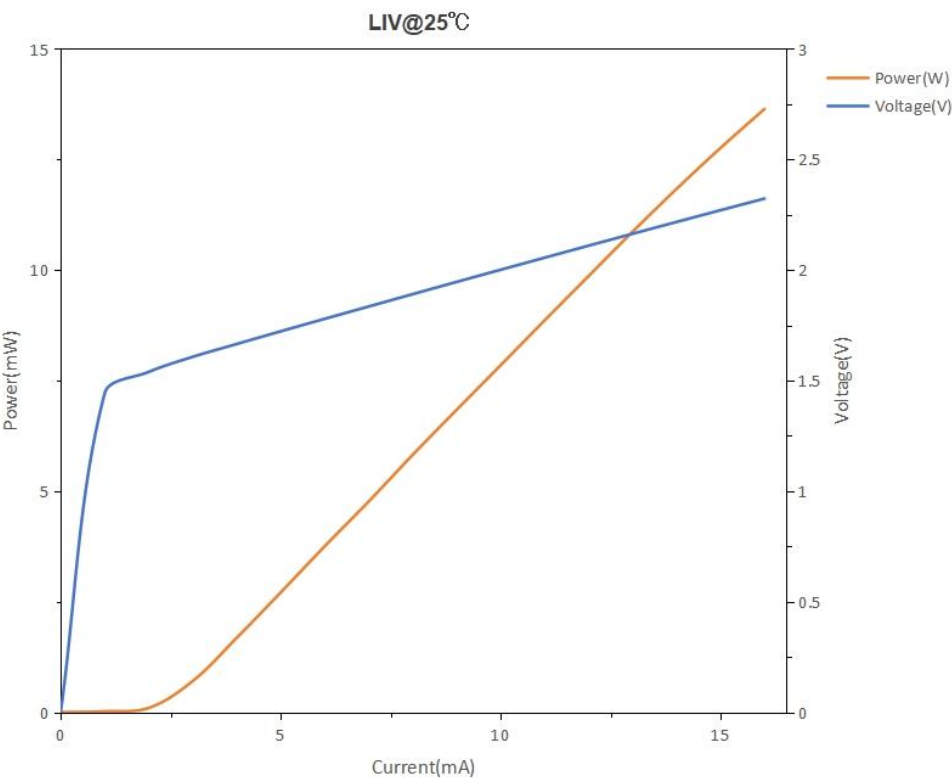
本文件及其披露的任何数据的所有权均属于度亘核芯光电技术（苏州）股份有限公司，构成并包含专有信息。除非度亘核芯光电技术（苏州）股份有限公司明确书面授权，否则不具有任何接收或拥有本文件授予或转让复制、使用或披露本文件所含任何信息的权利。

DG

REV: R01

商业秘密

Electro-optic conversion curve



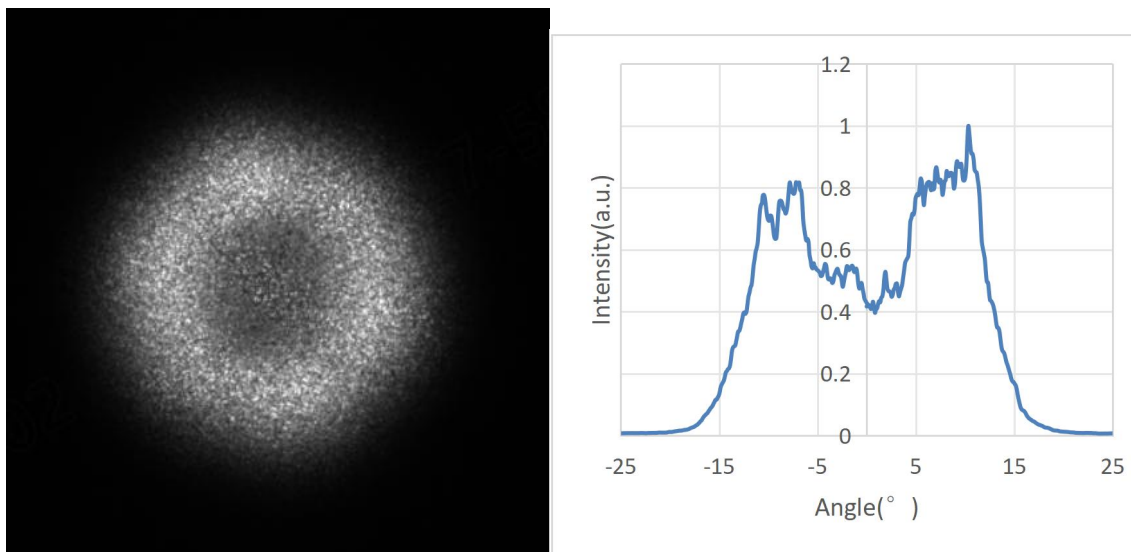
* All tests are under CW condition with heatsink temperature 25°C

本文件及其披露的任何数据的所有权均属于度亘核芯光电技术（苏州）股份有限公司，构成并包含专有信息。除非度亘核芯光电技术（苏州）股份有限公司明确书面授权，否则不具有任何接收或拥有本文件授予或转让复制、使用或披露本文件所含任何信息的权利。

DG
REV: R01

商业秘密

Far Field profile



*All tests are under CW condition with heatsink temperature 25°C

本文件及其披露的任何数据的所有权均属于度亘核芯光电技术（苏州）股份有限公司，构成并包含专有信息。除非度亘核芯光电技术（苏州）股份有限公司明确书面授权，否则不具有任何接收或拥有本文件授予或转让复制、使用或披露本文件所含任何信息的权利。

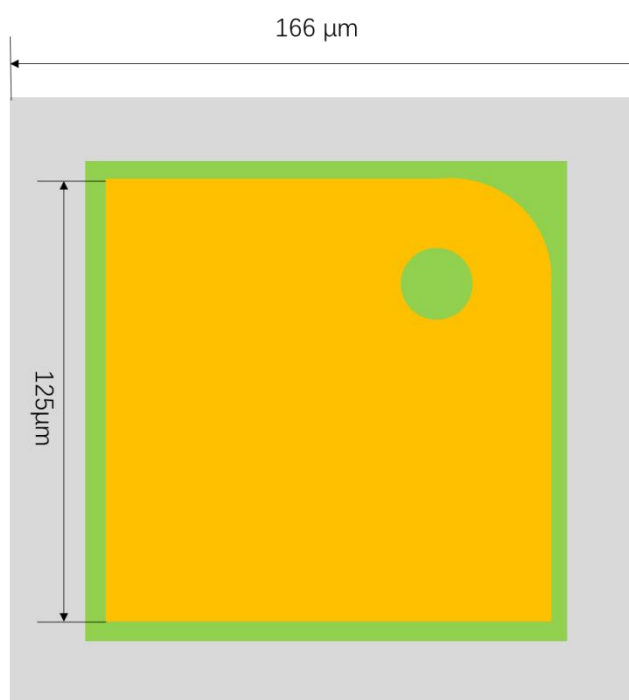
DG

REV: R01

商业秘密

Product appearance mechanical characteristics

Parameter	Ratings	Units
Number of emitters	1	#
Chip Width	166 ± 20	μm
Chip Length	166 ± 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	°C
Operating humidity	Hop	0	85	%
Storage temperature	Ts	-40	110	°C
Storage humidity	Hs	0	85	%

Unless modified in the Terms of Sale, the Product Specification may not be extended, including, but not limited to, any warranties made herein.

本文件及其披露的任何数据的所有权均属于度亘核芯光电技术（苏州）股份有限公司，构成并包含专有信息。除非度亘核芯光电技术（苏州）股份有限公司明确书面授权，否则不具有任何接收或拥有本文件授予或转让复制、使用或披露本文件所含任何信息的权利。

DG

REV: R01

商业秘密

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.

Product Disclaimer

Dogain Core Optoelectronic Technology(Suzhou)Co.,Ltd. and its employees shall not be liable for any errors, inaccuracies or incompleteness contained in any data sheet or any product-related information.

We make no representations or warranties as to the fitness of the Products for any particular purpose or whether to continue to manufacture any Products. To the fullest extent permitted by applicable law, DoGain will not be liable for:

- 1.Any liability arising from the application or use of any of the products.
- 2.Any implied warranties, including warranties of fitness for a particular purpose, non-infringement and merchantability. We hereby declare that we shall not be liable for any direct, indirect, consequential, punitive, special or incidental losses (including but not limited to financial profit or loss, business interruption or loss of information) arising out of compliance with or failure to comply with this document.

It is the customer's responsibility to verify that the properties of the particular product described in the product specification are suitable for use in specific application scenarios. The parameters provided in the datasheet and/or specification may vary from application to application and performance may vary over time. All operating parameters, including typical parameters, must be confirmed for each application scenario by the customer's technical experts.

Customer will be solely responsible for all legal, regulatory and safety requirements relating to Customer's products, although information or support may be provided in connection with product applications.

This document does not grant any license to any intellectual property rights, whether express or implied, by estoppel or otherwise. DoGain reserves the right to change any of its products and accompanying documentation without prior notice. Unless modified in the Terms of Sale, the Product Specification may not be extended, including, but not limited to, any warranties made herein.

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.



本文件及其披露的任何数据的所有权均属于度亘核芯光电技术（苏州）股份有限公司，构成并包含专有信息。除非度亘核芯光电技术（苏州）股份有限公司明确书面授权，否则不具有任何接收或拥有本文件授予或转让复制、使用或披露本文件所含任何信息的权利。

DG

REV: R01

商业秘密