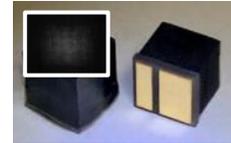




VDOE940COB10K

940nm VCSEL Structured Light Projector, 10980-Dot Pattern

Data Sheet



Description

The Lasermate VDOE940COB10K is a 940nm wavelength, VCSEL integrated with advanced 10,980-dot pattern diffractive optical element (DOE). The VCSEL is specially designed for open-space 3D structure light. With ultra-small thermally efficient COB package, its compact footprint enables economics of scale and excellent integration flexibility.

Features

- 940nm wavelength VCSEL
- Ultra-small COB package
- Standard solder reflow-able
- Low power consumption
- IEC 60825 eye safety standards
- High uniform 10,980-dot pattern

Applications

- Portable device
- Structured light for 3D sensing

Electrical-Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit	Conditions
Threshold current	I_{th}		360		mA	
Forward voltage	V_f		1.75	1.95	V	
Center wavelength	λ_c	930	940	950	nm	

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit	Conditions
Wavelength shift	$\Delta\lambda/\Delta T$		0.1		nm/°C	25°C~100°C
Output power decay	$\Delta P_o/\Delta T$		-16.81		mW/°C	25°C~100°C
Forward voltage decay	$\Delta V_f/\Delta T$		-0.0022		V/°C	25°C~100°C

DOE Specifications

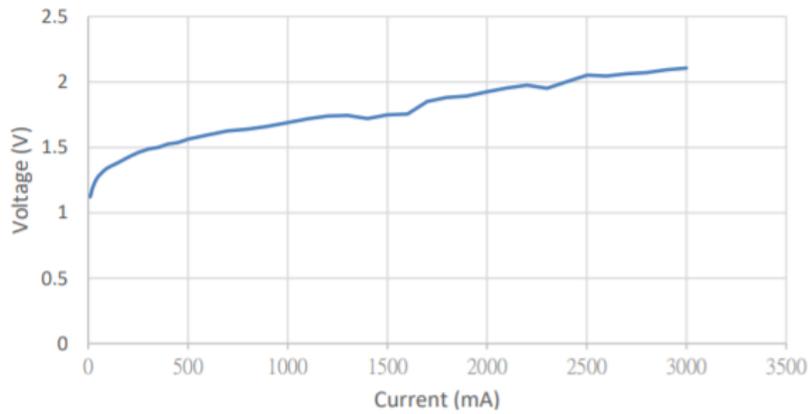
Pattern size @ 100cm	1708.2 x 1154.7mm (HxV)
Total dots	10,980
Field of View (FOV)	81° x 60° (HxV)
Contrast ¹	≥ 7
Uniformity ² in FOV at 1m	$\geq 30\%$

¹ Contrast: in the defined area, the ratio of the 95th percentile of the grayscale value over the mode grayscale value of the background, $C=I_{95\%}/I_{median}$

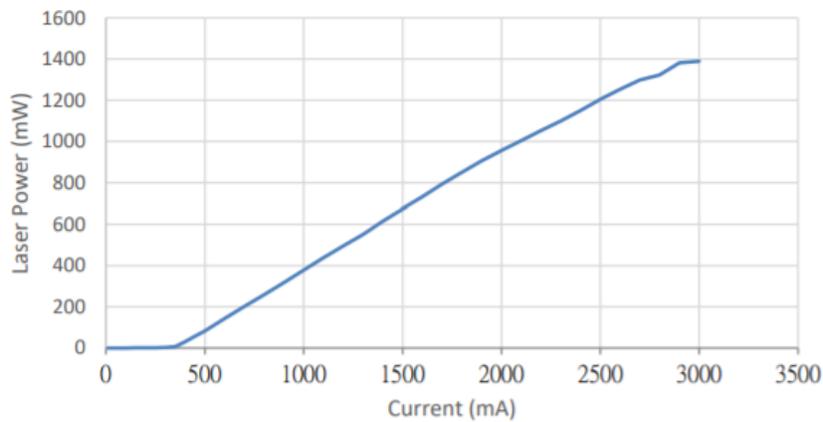
² Uniformity: the ratio of the grayscale value of the area at a given location to the grayscale value of the area in the center of the pattern, $U=I_{each\ area}/I_{max\ of\ each\ area}$

Typical Characteristic Curves

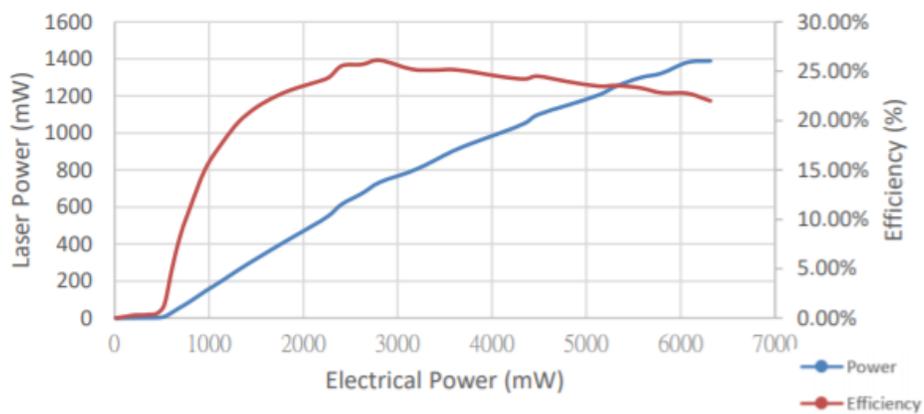
Laser module characteristic I-V Curve



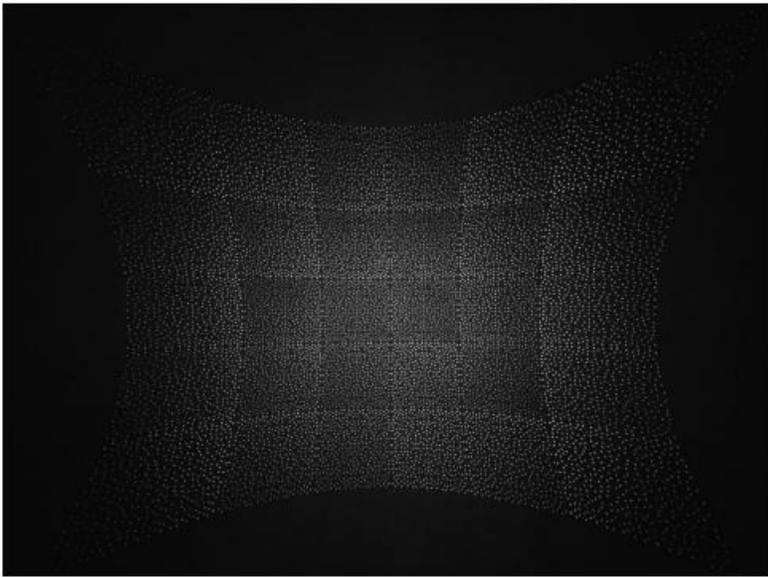
Laser module characteristic I-P Curve



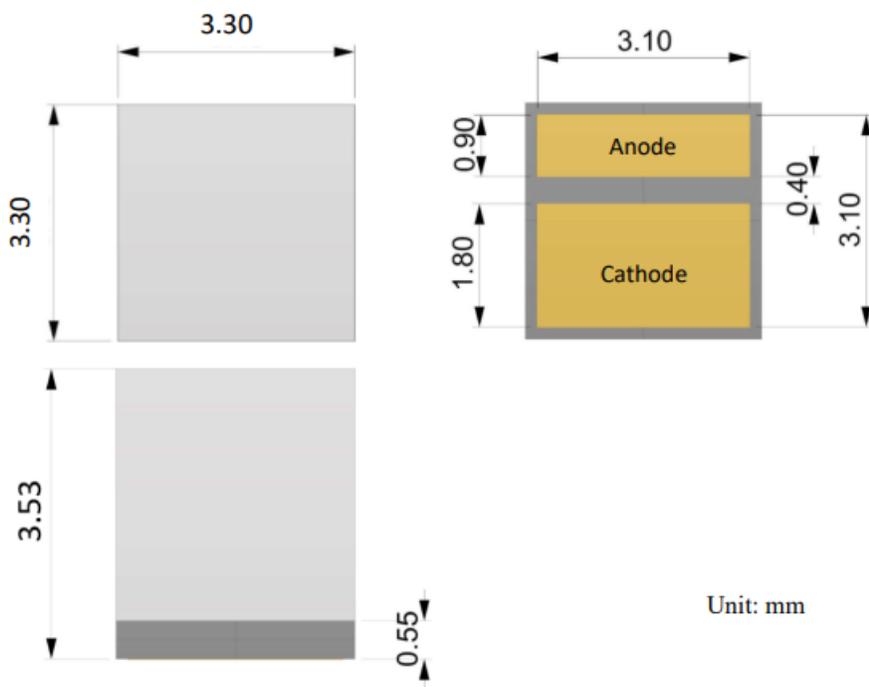
Electrical-to-optical conversion efficiency



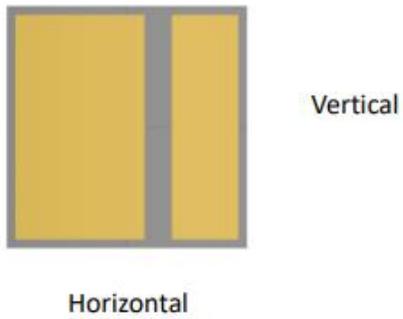
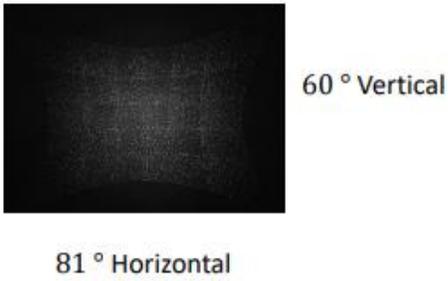
Projection Pattern



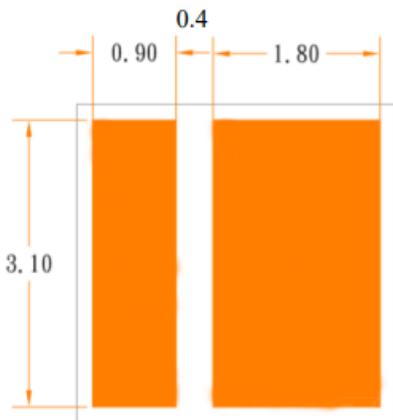
Mechanical Dimensions



Orientation of Field of View



Recommended Solder Pad (unit: mm)



Additional Notes

1. Treat heat dissipation before setting the module to full power
2. Avoid touching the emitting area or optical components of the module.
3. Never look directly at the light from the emitting area.
4. The VCSELs are designated solely as OEM components for incorporation into the customer's end products. Therefore, it is the customer's responsibility to comply with the appropriate requirements of FDA 21CFR, section 1040.10 and 1040.11 for complete laser products. For the code of FDA regulations, please refer to [FDA Performance Standards for Light-Emitting Products](#) for detailed information.
5. Specifications are subject to change without notice.

