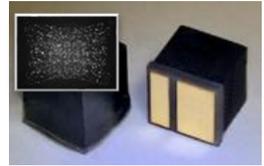




# VDOE850COB9K

## 850nm VCSEL Structured Light Projector, 9072-Dot Pattern

Data Sheet



### Description

The Lasermate VDOE850COB9K is an 850nm wavelength, VCSEL integrated with advanced 9,072-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

- 850nm wavelength VCSEL
- Ultra-small COB package
- Standard solder reflow-able
- Low power consumption
- IEC 60825 eye safety standards
- High uniform 9,072-dot pattern

### Applications

- Portable device
- Structured light for 3D sensing

### Electrical-Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit	Conditions
Operating temperature	$T_{op}$	0	35	60	°C	Measured at the bottom of the VCSEL die substrate during typical operating conditions
CW output power	$P_o$	-	750	-	mW	$I_F=1.0A, t_p=10ms$
	$P_o$	-	75	-	mW	$I_F=0.3A, t_p=10ms$
	$P_o$	-	35	-	mW	$I_F=0.25A, t_p=10ms$
	$P_o$	-	5	-	mW	$I_F=0.2A, t_p=10ms$
Threshold current	$I_{th}$		200		mA	
Forward voltage	$V_f$	1.65	1.95	2.25	V	$I_F=1.0A, t_p=10ms$
Center wavelength	$\lambda_c$	840	850	860	nm	$I_F=1.0A, t_p=10ms$
Spectral width (FWHM)			3	5	nm	$I_F=1.0A, t_p=10ms$
Slope efficiency	$\eta_s$		0.95		W/A	$I_F=1.0A, t_p=10ms$
Power conversion efficiency	PCE	34.5	38.5	42.5	%	$I_F=1.0A, t_p=10ms$

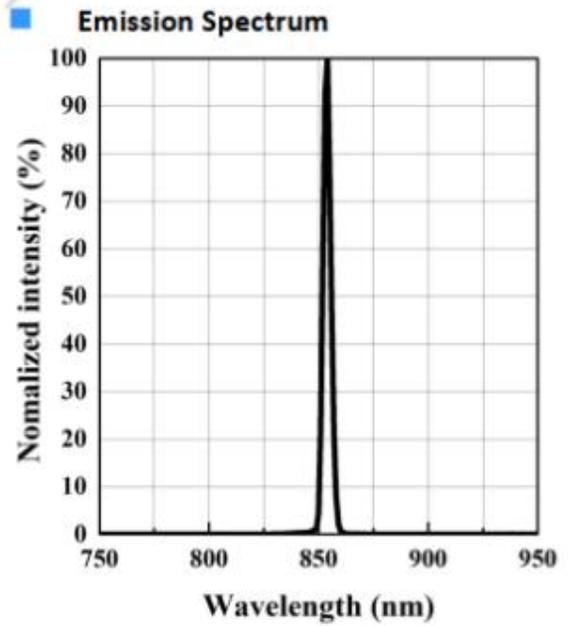
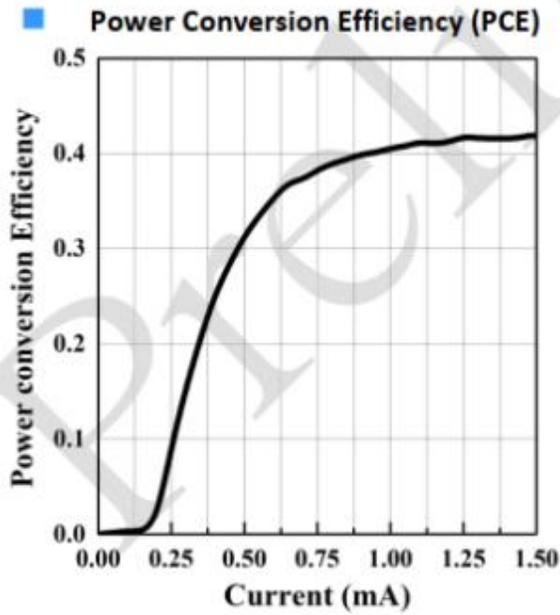
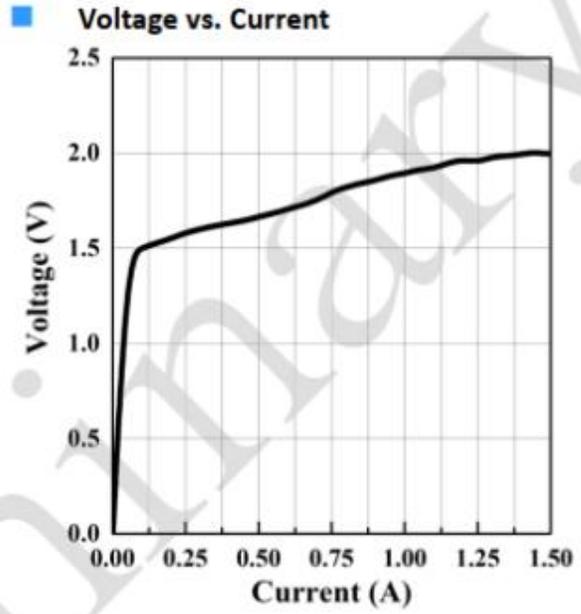
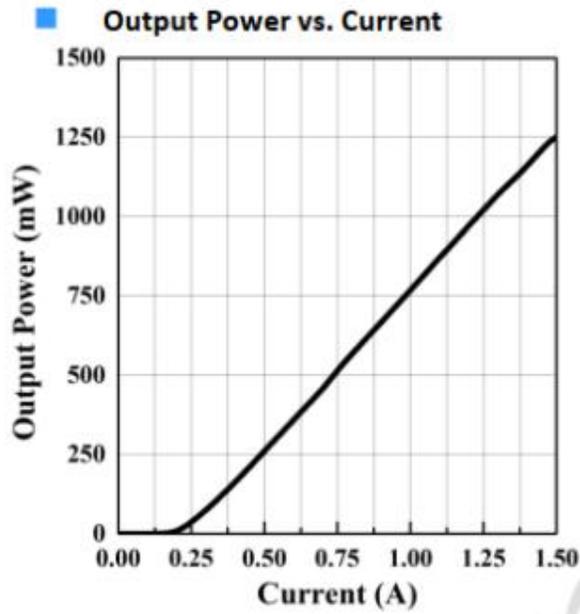
### DOE Specifications

Pattern size @ 1000mm	1652.6 x 1019mm (HxV)
Total dots	9,072
Field of View (FOV)	76° x 54° (HxV)
Contrast <sup>1</sup>	≥7.5
Uniformity <sup>2</sup>	≥35%

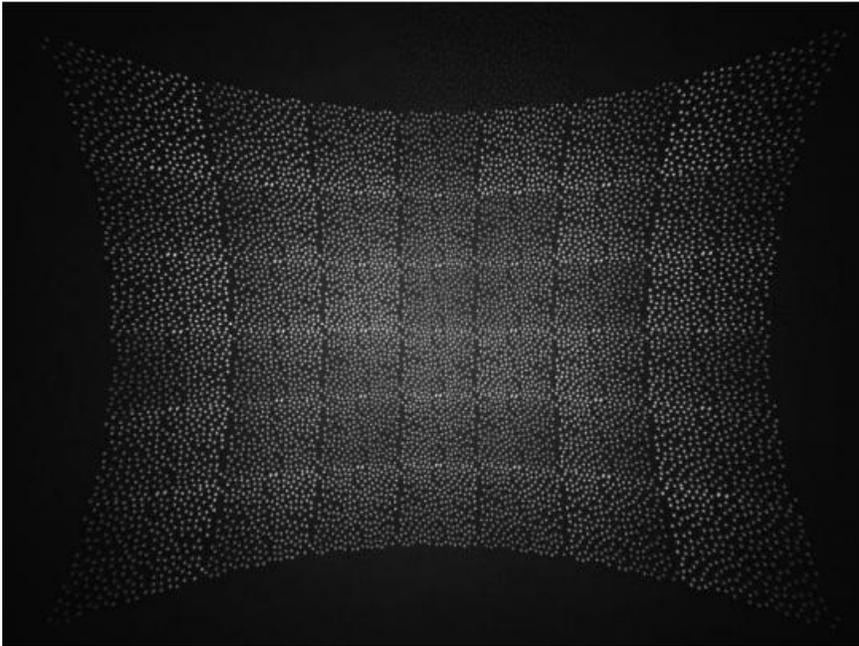
<sup>1</sup> Contrast: in the defined area, the ratio of the 95th percentile of the grayscale value over the mode grayscale value of the background,  $C=I_{95\%}/I_{median}$

<sup>2</sup> 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,  $U=I_{each\ area}/I_{max\ of\ each\ area}$

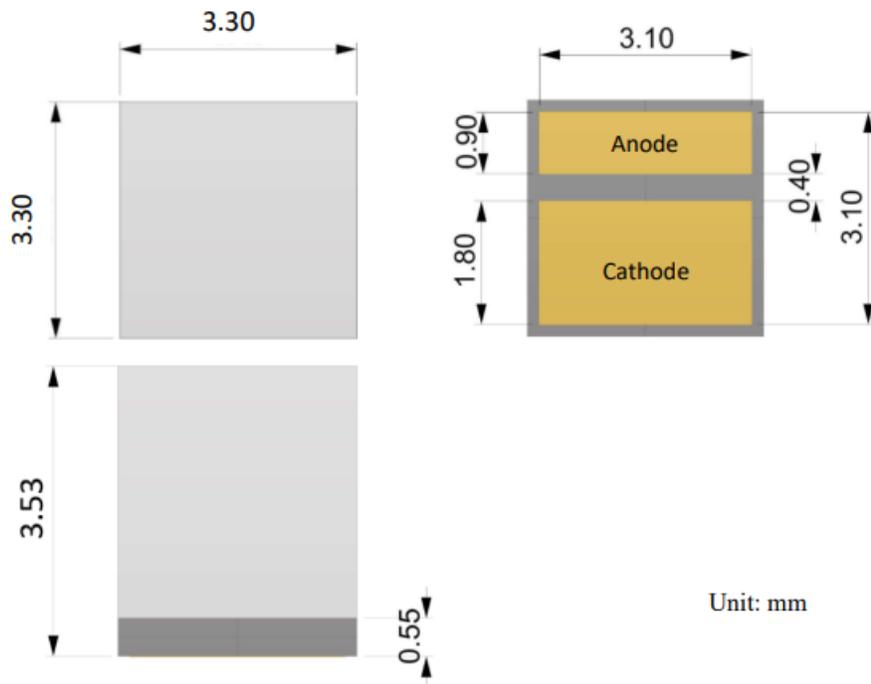
Typical Characteristic Curves

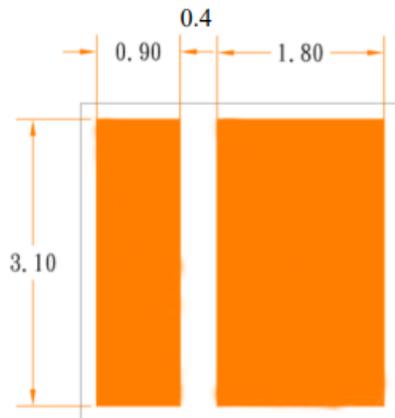


### Projection Pattern



### Mechanical Dimensions



**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.