



940nm Diffractive Optical Element (DOE) Laser Module with 38,000-Random Dot Pattern, 3V PCB Driver

MDOE940A200R383



Overview

The Lasermate MDOE940A200R383 is a 940nm infrared laser module integrated with a 38,000-random dot pattern diffractive optical element (DOE). Engineered for structured light and depth sensing applications, the module features a 3V PCB driver and an adjustable focusing lens. Its compact design and invisible IR emission make it ideal for use in 3D imaging, face recognition, gesture tracking, and other vision-based systems.

Features

- 940nm diffractive optical element (DOE) laser module
- 38,000-random dot pattern
- Field of View (FOV): 68° x 48.5° (H x V)
- Low distortion and high uniform pattern
- Flexible package for R&D evaluation
- Distance tunable projection
- PWM drivable
- IEC 60825 eye safety standards

Applications

- Structured light for 3D sensing
- Machine vision

Specifications

Electrical-Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit	Conditions
Threshold current	I_{th}	-	20	50	mA	25 °C
Operating current	I_{op}	-	270	320	mA	
Operating voltage	V_{op}	1.6	2.0	2.4	V	
Power input with PCB			3	3	V	25 °C
Wavelength	λ	930	940	950	nm	$P_o=200mW$
Differential efficiency	η	0.6	0.8	1.2	mW/mA	$P_o=200mW$

Laser Diode Power Ratings

Parameter	Symbol	Rating	Unit	Conditions
CW output power (max)		200	mW	
Operating temperature	T_{op}	-10 to 60	°C	
Storage temperature	T_{stg}	-40 to 85	°C	

Mechanical Characteristics

Diameter	8mm
Length	14~15mm
PCB driver	9(W) x 12(L) x 3(H)mm

Notes:

- Length varies as the position of the collimating lens varies case by case.
- Total module length varies with the length of metal pins left after welding.

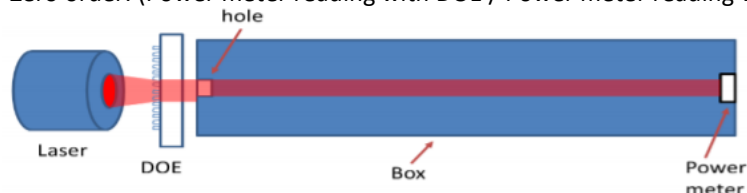
Optical Specifications

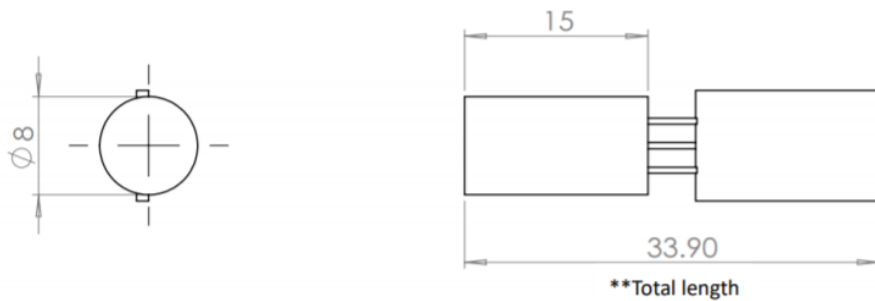
Total dots	38,000
Field of View (FOV)	68° x 48.5° (HxV)
Contrast ¹	≥ 5
Uniformity ² in FOV at 1m	$\geq 30\%$
Zero order ³	$\leq 0.2\%$

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

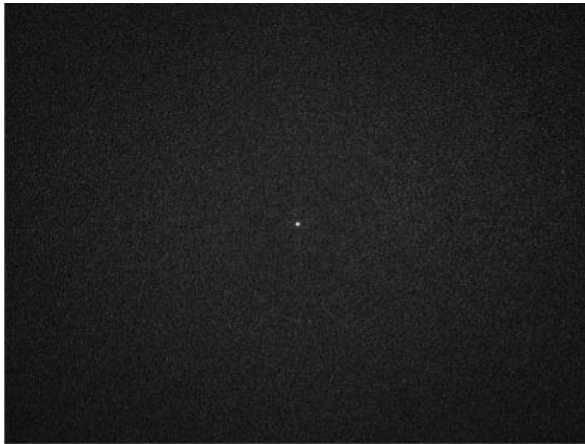
² Uniformity: the ratio of the grayscale value of the area at a given location to the grayscale value of the area in the center of the pattern, $U=I_{each\ area}/I_{max\ of\ each\ area}$

³ Zero order: (Power meter reading with DOE / Power meter reading without DOE) x 100%

**Outline Dimensions (unit: mm)**



Projection Pattern



Additional Notes

- Treat heat dissipation before setting the module to full power
- Avoid touching the emitting area or optical components of the module.
- Never look directly at the light from the emitting area.
- The laser modules 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.
- Specifications are subject to change without notice.



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