850nm Diffractive Optical Element (DOE) Laser Module with 5,000-Random Dot Pattern, 3V PCB Driver

MDOE850A200R53

Overview

The Lasermate MDOE850A200R53 is an 850nm DOE laser module featuring a 5,000-random dot pattern. Designed for R&D and advanced applications, it includes an adjustable focusing lens and adjustable current control to set output power within a specified range. The module's compact 3V PCB driver ensures stable and reliable structured light projection, ideal for depth sensing, gesture recognition, and machine vision.

Features

- 850nm diffractive optical element (DOE) laser module
- 5,000-random dot pattern
- Field of View (FOV): 50° x 38° (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}	-	18	30	mA	25 °C, P_o=200mW
Operating current	I_{op}	-	230	265	mA	25 °C, P_o=200mW
Operating voltage	V_{op}	-	2.1	2.3	V	25 °C, P_o=200mW
Slope efficiency	SE		0.95		mW/mA	P_o=50-150mW
Center wavelength	λ_c	840	850	860	nm	
Power input with PCB			3	3	V	25 °C, variable resistor included

Laser Diode Power Ratings

Parameter	Symbol	Rating	Unit	Conditions
CW output power (max)		350	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	5,000
Field of View (FOV)	50° x 38° (HxV)
Contrast[1]	≧4
Uniformity[2] in FOV at 1m	≧30%
Zero order	≦0.3%

[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, $U=I_{each\ area}/I_{max\ of\ each\ area}$
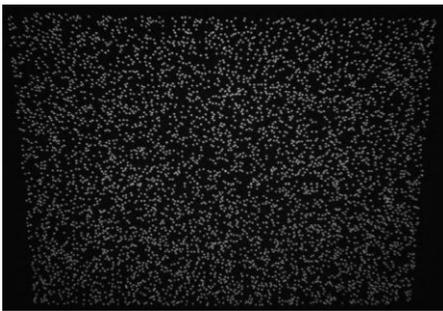
Typical Characteristics

I-P Curve of Chip
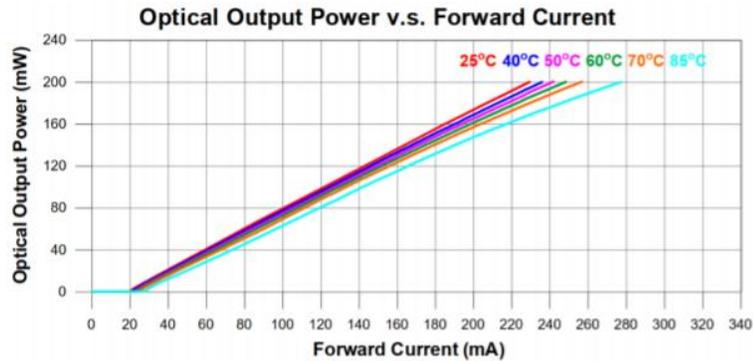
Note: Module optical power output is lower.

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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