

GMP85LARYK8 — A Class 1 850 nm Random-Dot DOE Structured Light Laser Module

Overview

The GMP85LARYK8 is a Class 1, 850 nm continuous-wave (CW) structured-light laser module designed as a flexible R&D and evaluation platform for DOE projector development, pattern evaluation, pre-production testing, and scalable volume production. It integrates a precision Diffractive Optical Element (DOE) within an exchangeable holder, a plastic aspherical lens, an adjustable focus optical design, a single-mode 850 nm laser diode, and a fail-safe Automatic Power Control (APC) circuit designed to support IEC 60825-1 Class 1 operation driven by a standard 3–5 VDC supply.

The module projects either 10,000 or 30,000 random dots over an $80^\circ \times 64.4^\circ$ (H $\times$ V) FOV, delivering a DOE contrast of ≥ 10 and ≥ 3 , respectively. Its exchangeable DOE holder facilitates the rapid testing of alternative patterns, while the adjustable focus allows for precise optimization at specific working distances. CW operation provides continuous illumination during camera exposure for stable optical output and consistent dot intensity, while the APC circuit provides stable and repeatable laser output. The GMP85LARYK8 is well suited for indoor active-stereo 3D sensing, depth sensing, and other optical sensing applications.

Features

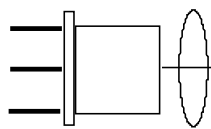
- Exchangeable DOE holder
- Adjustable focus for optimizing working distance
- CW operation from 3 – 5 VDC
- IEC 60825-1 compliant, fail-safe APC circuit
- Class 1 laser module with a fail-safe APC laser diode driver

Applications

- Active stereo 3D sensing
- 3D depth sensing
- Machine vision
- Robotics and automation
- Industrial inspection & measurement

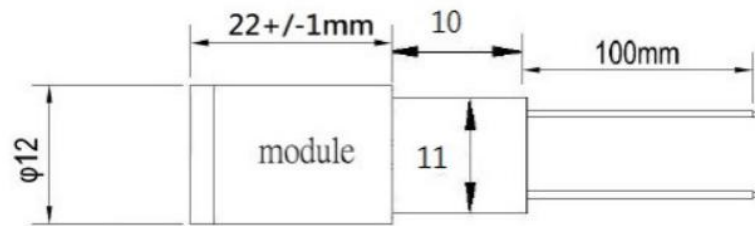
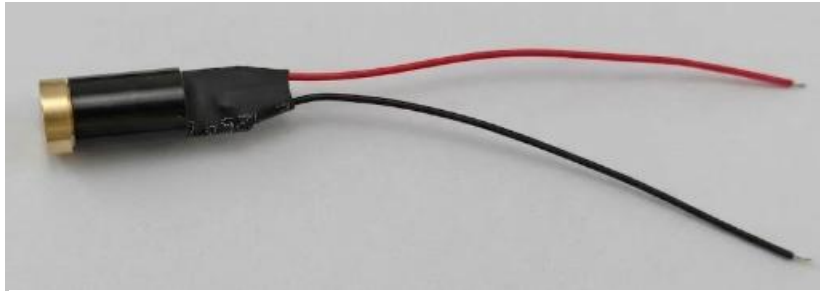
Specifications

Parameter	GMP85LAR10K8	GMP85LAR30K8
Wavelength at 25 °C	850nm $\pm$ 10nm	
Number of DOE Random Dots	10,000	30,000
DOE Contrast*	≥ 10	≥ 3
DOE Uniformity*	$\geq 30\%$	$\geq 30\%$
DOE Field of View (FOV)	$80^\circ \times 64.4^\circ$ (H x V)	
Area of FOV	~168 cm x 126 cm at 100 cm	
Laser driver circuit design	IEC 60825-1 compliant, fail-safe APC circuit	
Operation Mode	CW (Continuous Wave)	
Optical output power*	0.39mW ~ 0.62mW (0.54mW typ.) measured by a $\varnothing 7$ mm aperture sensor at 10cm	
Laser classification	Class 1 calculated optical output power AEL: 0.778mW for CW	
Focus	Adjustable focus (factory-set fixed focus available upon request)	
Operating voltage	3 to 5V DC	
Operation current @ 25 °C	≤ 100 mA	
Operating temperature	-10°C to 60°C	
Storage temperature	-40°C to 85°C	
Wire connection	Red: VCC; black: GND	
Housing	Black housing; insulated	
Dimensions	Housing: $\varnothing 12$ mm x L. 22 ± 1 mm; Driver PCB: L. 10mm x W. 11mm	



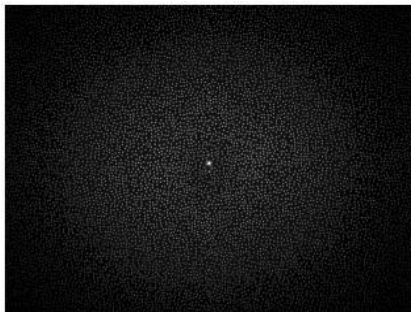
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Mechanical outline (Unit: mm)



DOE random dots pattern

10,000 dots



30,000 dots



Notes:

- * DOE Contrast is defined as the ratio of the 95th percentile of the grayscale value over the median grayscale value of the background.
- * DOE Uniformity is the ratio of the grayscale value of the dots at a given location to the grayscale value of the dots in the center of the pattern, $U = I_{each\ area} / I_{max\ of\ each\ area}$.
- * Optical output power is measured at 10 cm using a Ø7 mm aperture sensor, including the zero-order spot.
- * Additional heat sink or cooling device may be needed if the laser module is operated continuously for a long period of time.
- * The GMP- series DOE 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.