

LASERMATE GROUP, INC.

THE FRIEND OF LASERS

LTG85LARYK8T — A Class 1 850 nm Random-Dot DOE Structured Light Laser Module

Overview

The LTG85LARYK8T is a Class 1, 850 nm continuous-wave (CW) structured-light laser module integrating a precision Diffractive Optical Element (DOE), a glass 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, with TTL modulation from DC to 10 kHz.

The laser module projects either 10,000 or 30,000 random dots over an $80^\circ \times 64.4^\circ$ (H x V) field of view (FOV), with a DOE contrast ≥ 10 or ≥ 3 , respectively. The adjustable-focus optical design enables optimization of the projected dot pattern for the desired working distance. The APC circuit maintains controlled optical output for stable and repeatable performance in indoor active-stereo 3D sensing, 3D depth sensing, and other optical sensing applications.

Features

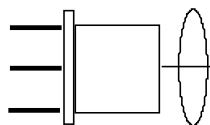
- Adjustable focus for optimizing working distance
- TTL modulation from DC to 10 kHz
- Operating current ($\leq 100\text{mA}$) at 100% duty cycle
- IEC 60825-1 compliant, fail-safe APC circuit
- Class 1 laser module with a fail-safe APC laser diode driver

Applications

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

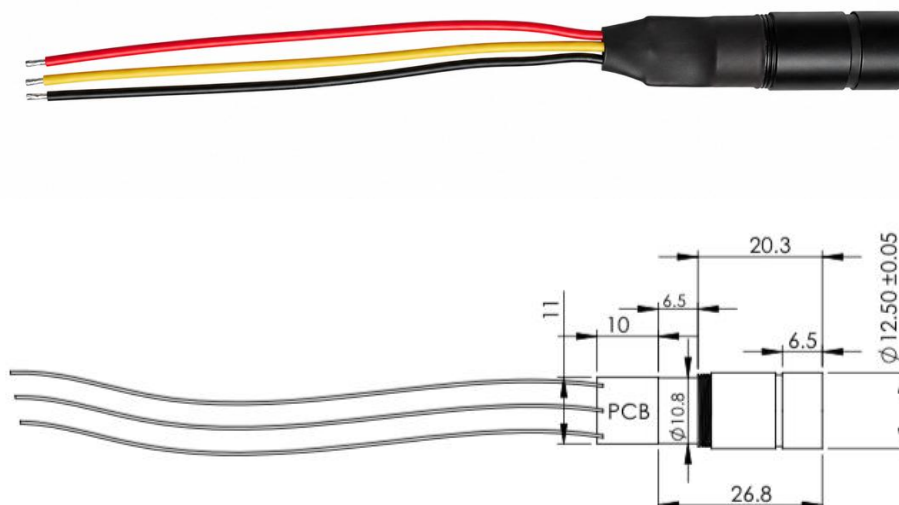
Specifications

Parameter	LTG85LAR10K8T	LTG85LAR30K8T
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 distance	
Laser driver circuit design	IEC 60825-1 compliant, fail-safe APC circuit with TTL modulation from DC to 10 kHz	
Control input voltage	0 to 5 VDC	
Operating voltage	3.3 to 5 VDC	
Optical output power*	0.32mW ~ 0.62mW (0.54mW typ.) at 100% duty cycle using a $\varnothing 7\text{mm}$ sensor at 10cm	
Laser classification	Class 1 calculated peak optical output power AEL: 0.778mW for CW or 100% duty cycle; 1.05mW for 30Hz 30% duty cycle	
Focus	Adjustable focus (factory-set fixed focus available upon request)	
Operation current @ 25 °C	$\leq 100\text{mA}$ at 100% duty cycle	
Operating temperature	-10°C to 60°C	
Storage temperature	-40°C to 85°C	
Wire connection	Black: GND; Red: VCC; Yellow: TTL	
Housing	Black housing body: insulated; Brass housing: connected to VCC / Case Positive	
Dimensions	Black Housing: $\varnothing 12.5\text{mm}$ x L 20.3mm Brass Housing: $\varnothing 10.8\text{mm}$ x L 6.5mm Driver PCB: L. 10 mm x W. 11 mm	



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Mechanical outline (Unit: mm)



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 $\varnothing 7$ mm aperture sensor, including the zero-order spot.
- * An additional heat sink or cooling device may be required if the laser module is operated continuously for a long period of time.
- * The LTG- 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](http://www.fda.gov/oc/ohrt/laser.htm) for detailed information.
- * Specifications are subject to change without notice.