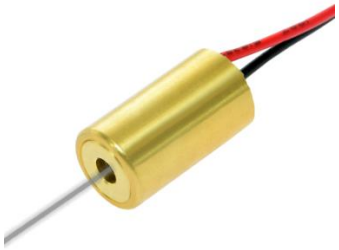
Quarton inc.

IR Industrial Use Laser

VLM-850-01 Series

	
Lead Wire Type	Spring Type

FEATURES:

- Designed and manufactured in Taiwan, ensuring exceptional quality and durability.
- This module is an industrial-grade product that integrates an Aspherical plastic collimating lens, a laser diode, and an APC driver circuit into a compact and durable solid brass housing.
- Operating Voltage: 2.6-6 VDC
- Wavelength : 850 nm
- Laser power output : LPB - Class 3B - 45~50mW
  LPA - Class 3R - 2.5~3.5mW
- LPO - Class 1 - less than 0.7mW.
- Beam Divergence (Full Angle) : 0.5 mRad
- Dimensions: D10.5 x L18.4 mm (D0.413 x L0.724 inches).
- Compact design with an integrated Auto-Power-Control (APC) driver circuit for safe and consistent laser output.
- 850 nm Laser: A near-infrared (NIR) wavelength that is invisible to the naked eye but easily detectable by most near-infrared sensors. It provides wide compatibility with existing IR cameras and sensing systems.
- Typical Applications: Illumination for Night Vision Systems, Eye Tracking, Industrial Sensing, Biometric Devices, Medical Applications etc.
- Connection type: Lead wire / Spring.

The 850 nm laser operates within the near-infrared (NIR) spectrum, making it invisible to the naked eye, but detectable by most near-infrared sensors. Its wavelength offers several advantages for applications that require invisible light or non-invasive sensing. Here are the key characteristics and typical applications of the 850 nm laser:

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Wavelength Characteristics:

- Near-Infrared (NIR): At 850 nm, the laser falls within the near-infrared range. This wavelength is invisible to the human eye, meaning it does not produce visible light under normal conditions.
- Detectable by NIR Sensors: While the 850 nm laser is not visible to the naked eye, it is easily detected by specialized NIR sensors. These sensors are commonly used in devices designed for low-light or night-vision purposes, enabling the laser to be useful in a variety of optical and sensing technologies.

Typical Applications:

- **Night Vision Systems:**
  Infrared Cameras and Security Systems: The 850 nm laser is widely used in night vision systems and security cameras. It provides infrared illumination in low-light or no-light environments, allowing cameras equipped with NIR sensors to capture clear images or videos. These lasers are commonly used in surveillance, monitoring, and military applications where visibility is critical, but the light needs to remain invisible to the human eye.
- **Eye Tracking:**
  Gaze-Tracking Systems: The 850 nm laser is frequently used in eye-tracking devices. This wavelength is ideal for interacting with infrared sensors used to track the position of the eye. The 850 nm wavelength ensures that the laser is not visible to the user, allowing for accurate tracking of eye movement without causing distractions or discomfort.
- **Industrial Sensing:**
  Distance Measurement and LiDAR: In industrial applications, the 850 nm laser is used in distance measuring systems and LiDAR (Light Detection and Ranging). LiDAR systems often employ lasers with wavelengths in the NIR spectrum to measure distances accurately, scan environments, and create 3D models of objects or terrains. The 850 nm laser is particularly suited for industrial environments, where accurate distance measurements and environmental scanning are essential.
- **Biometric Devices:**
  Facial Recognition and Iris Scanners: The 850 nm laser is commonly found in biometric devices such as facial recognition systems and iris scanners. This wavelength allows for clear, high-resolution scanning of the face or iris, which is essential for identification and security purposes. The infrared light emitted by the 850 nm laser interacts with the facial features or iris patterns to create a unique biometric profile for verification or authentication.

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- **Medical Applications:**
  Pulse Oximetry and Diagnostics: The 850 nm wavelength is used in pulse oximeters and other non-invasive diagnostic devices. In pulse oximetry, the laser helps to measure the oxygen saturation of the blood by passing infrared light through a patient's skin and analyzing how the light is absorbed by the blood. This wavelength is ideal for such applications because it can penetrate the skin effectively and interact with the hemoglobin in the blood, providing accurate readings in a non-invasive manner.

Summary:

The 850 nm laser is an essential tool for many modern technologies due to its invisible NIR properties and compatibility with infrared sensors. Its typical applications include night vision systems, eye tracking, industrial sensing (LiDAR), biometric recognition systems, and medical diagnostics. These lasers provide efficient, non-visible light for various advanced systems that rely on accuracy and discretion, making them vital for fields such as security, health monitoring, and industrial automation.

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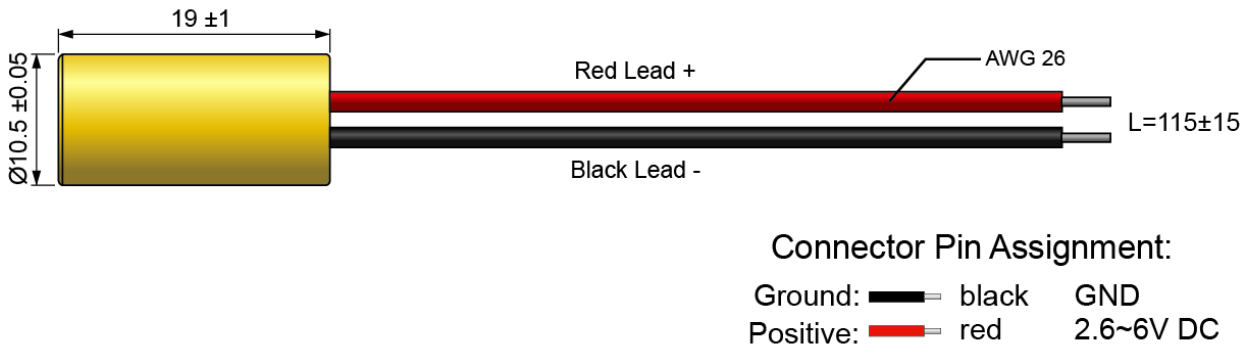
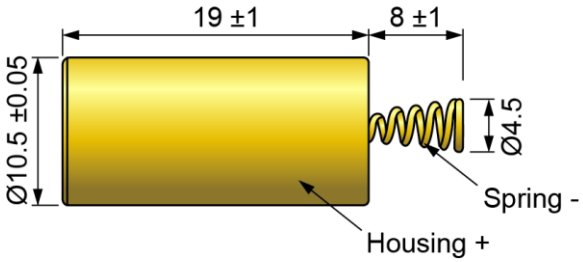
OUTLINE DIMENSIONS (UNITS: mm)

Outline (Lead Wire type)



Outline (Spring type)



SPECIFICATIONS

SPECIFICATIONS		VLM-850-01					
		LPO	**LPA**	**LPB**	**SPO**	**SPA**	**SPB**
1	Dimensions	Ø10.5 x 19 mm (Ø0.413" x 0.748")					
2	Weight	10±1g					
3	Operating voltage (Vop)	2.6~6 VDC					
4	Operating current (Iop)	Less than 40mA		Less than 130mA	Less than 40mA		Less than 130mA
5	Laser power output	Less than 0.7mW	2.5~3.5 mW	45~50 mW	Less than 0.7mW	2.5~3.5 mW	45~50 mW
6	Laser class	Class 1	Class 3R	Class 3B	Class 1	Class 3R	Class 3B
7	Wavelength at peak emission (λp)	840~865nm					
8	Collimating lens	Aspherical plastic lens					
9	Output aperture	5mm					
10	Beam shape	Ellipse					
11	Spot size	5±1 mm @ 5M					
12	Divergence (Full Angle)	0.5 mRad					

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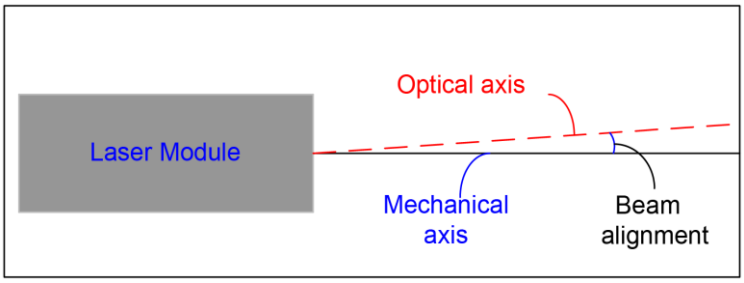
13	Beam alignment*	Less than 3°	
14	Operating temp. range**	+10°C ~+40°C	
15	Storage temp. range	-20°C ~+65°C	
16	Housing	Brass	
17	Potential of housing***	VDD(+)	
18	Electrostatic discharge (ESD)	30KV	
19	Moisture sensitivity level (MSL)	Level 1 - acc to JEDEC J-STD-020E.	
20	Protection circuit	Reversed supply circuit protection, over-current protection, surge protection	
21	Vibration resistance	10 to 55Hz,1.5mm amplitude for 2 hours each in X, Y and Z direction	
22	Standard	IEC60825:2014	
23	Connection type	1007-26 AWG	Spring
24	Cable length	115±15mm	8±1mm
25	Mean time to failure (MTTF) 25°C	10000hrs	
26	Application	General purpose	
27	Suggestion work distance	1~30 meters / 3~100 feet	

* Beam alignment:



** Operation temperature: it means within this temperature range, the laser spot/line will not be affected to change the spot size/line width. It can still work over this range, but the laser spot size or laser line width will be larger.

*** Laser module housing is an electrical positive surface, it is imperative that contact between the laser module and the machine be avoided. This is to prevent damage from the machine electrical leakage. Surge protected power supply to the laser module is strongly recommended.

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ORDER CODE

Order Code	Wavelength	Laser Power Output	Laser Class	Connection Type
VLM-850-01 LPO	850 nm	Less than 0.7mW	Class 1	Lead Wire
VLM-850-01 LPA	850 nm	2.5~3.5mW	Class 3R	Lead Wire
VLM-850-01 LPB	850 nm	45~50mW	Class 3B	Lead Wire
VLM-850-01 SPO	850 nm	Less than 0.7mW	Class 1	Lead Wire
VLM-850-01 SPA	850 nm	2.5~3.5mW	Class 3R	Lead Wire
VLM-850-01 SPB	850 nm	45~50mW	Class 3B	Lead Wire

SAFETY LABEL