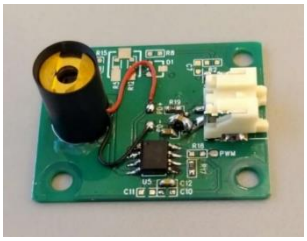
D9mm 650nm SMD Red Laser Module

Application

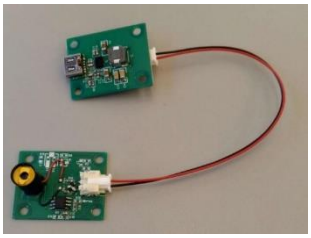
Industrial Alignment



Property

Wavelength Range = 650nm

Introduction



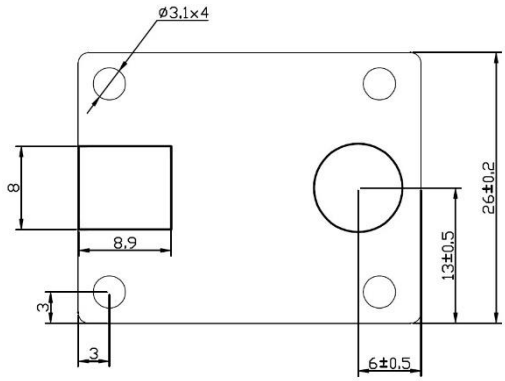
Other than typical round housing, standard SMD laser module is created to meet all industrial requirements. Users can easily integrate this module with any electronic project for concept verification. Once function confirmed, circuit board can be further optimized per request. Our standard modules are emitting 650nm wavelength, customized IR module is also available. Line or cross pattern can be prepared by integrating DOE components.

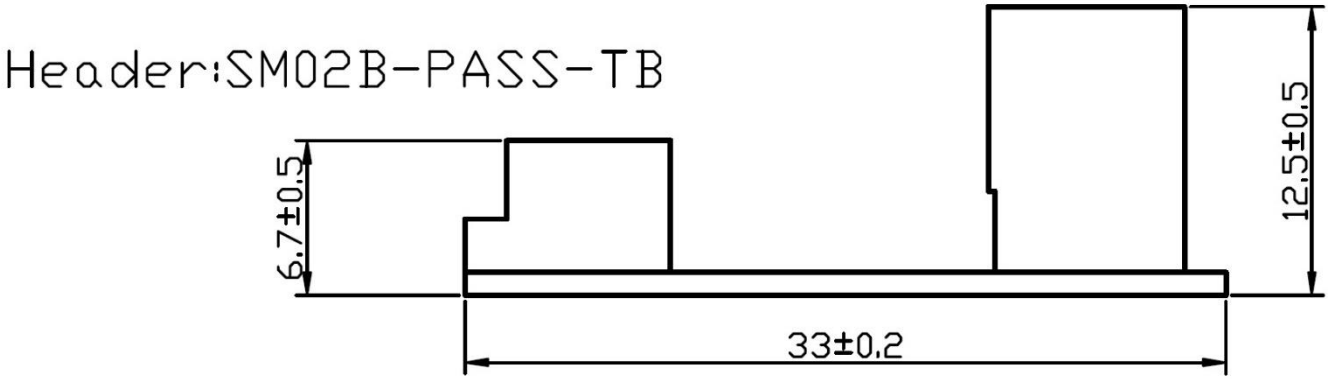
Specifications(T=25℃)

Items	Symbols	LM9R650M5D
Mode		CW
Wavelength	λ	650nm
Lens		PMMA
Spot	D/R	Dot
Spot Size	D	<8x14mm at 10m
Diameter x Length	Φ x L	8.5 x 11.5mm (lens) ; 26 x 33mm (circuit board)
Output Power	Po	1.5mW (typical)
Power Stability		<10%
Divergence Angle	mrad	<1
Operating Voltage(DC)	Vo	3V
CW Operating Current	Io	20mA (typical) , 30mA max
Operating Temperature	To	-10℃~ +60℃
Storage Temperature	Ts	-40℃~ +85℃
Housing Material		Anodized Aluminum
Mean time to failure		>5000 hrs

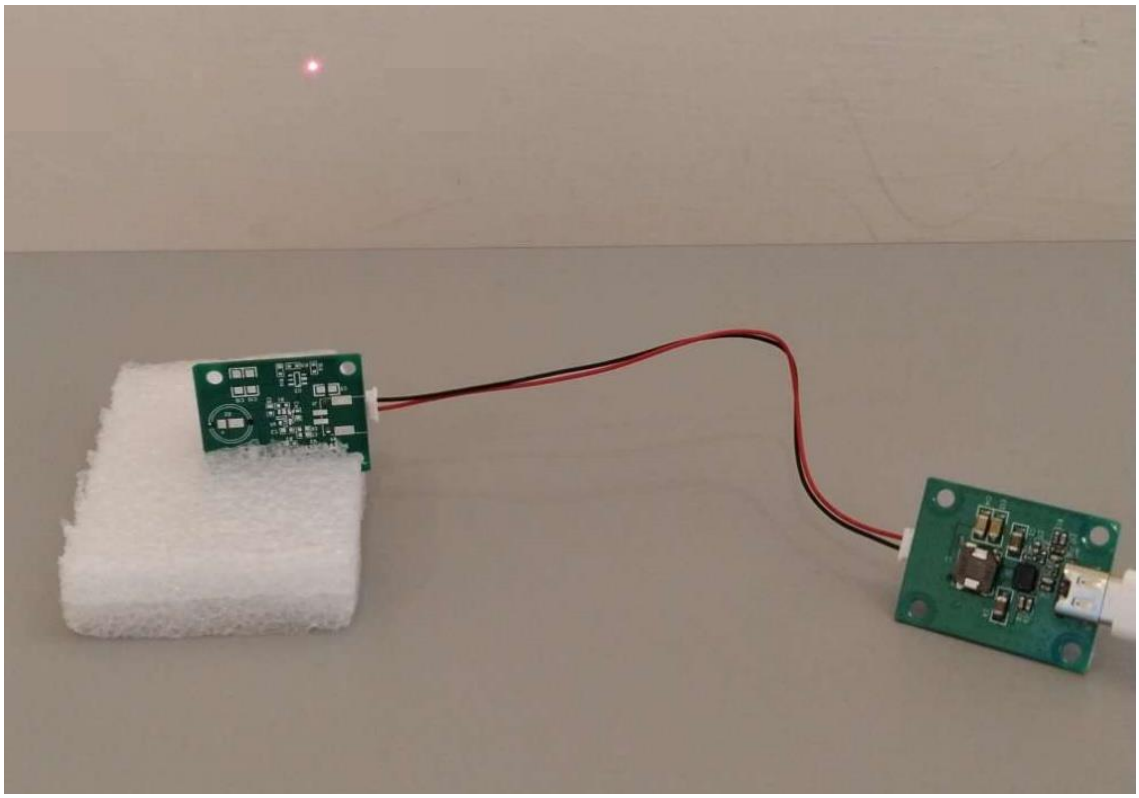
ATTENTION – Observe Precautions For Handling – Electrostatic Sensitive Device

Outline Dimensions





Spot size Performance



Power Stability

The actual output power of standard sample will be in the range 1mW to 2mW. But once make sure the value, for example, 1.5mW±0.075mW in the 25 ℃ temperature. ie. the power stability represents 5%.

Spot size

The spot size defined as Gaussian beam. In optics, a Gaussian beam is a beam of electromagnetic radiation whose transverse electric field and intensity (irradiance) distributions are well approximated by Gaussian functions. Many lasers emit beams that approximate a Gaussian profile, in which case the laser is said to be operating on the fundamental transverse mode, or "TEM00 mode" of the laser's optical resonator. When refracted by a diffraction-limited lens, a Gaussian beam is transformed into another Gaussian beam (characterized by a different set of parameters), which explains why it is a convenient, widespread model in laser optics.

Mean time to failure (MTTF)

Mean time to failure (MTTF) is the length of time a device or other product is expected to last in operation. MTTF is one of many ways to evaluate the reliability of pieces of hardware or other technology. It's important to note, however, that the mean time to failure metrics provided by companies regarding specific products or components may not have been collected by running one unit continuously until failure. Instead, MTTF data is often collected by running many units, even many thousands of units, for a specific number of hours.

Laser Safety

The light emitted from these devices has been set in accordance with IEC60825. However, staring into the beam, whether directly or indirectly, must be avoided.

CLASS 1 (OUTPUT POWER <0.39mW)

A Class 1 laser is safe under all conditions of normal use. This means the maximum permissible exposure (MPE) cannot be exceeded when viewing a laser with the naked eye or with the aid of typical magnifying optics (e.g. telescope or microscope). To verify compliance, the standard specifies the aperture and distance corresponding to the naked eye. For example, a high-power laser with a very large beam or highly divergent beam may be classified as Class 1 if the power that passes through the apertures defined in the standard is less than the AEL for Class 1. Often, devices such as optical drives will be considered class 1 if they fully contain the beam of a more powerful laser, such that no light escapes under normal use.

CLASS 2 (OUTPUT POWER <1mW)

A Class 2 laser is considered to be safe but may cause eyes uncomfortable if stare into laser light long time. Class-2 lasers are limited to 1 mW continuous wave, or more if the emission time is less than 0.25 seconds.

CLASS 3R(3A) (Output Power <5mW)

A Class 3R laser is considered safe if handled carefully, with restricted beam viewing. With a class 3R laser, the MPE can be exceeded, but with a low risk of injury. Visible continuous lasers in Class 3R are limited to 5mW. For other wavelengths and for pulsed lasers, other limits apply.

Class 4

Class 4 is the highest and most dangerous class of laser, including all lasers that exceed the Class 3B AEL. By definition, a class 4 laser can burn the skin, or cause devastating and permanent eye damage as a result of direct, diffuse or indirect beam viewing. These lasers may ignite combustible materials, and thus may represent a fire risk. Class 4 lasers must be equipped with a key switch and a safety interlock. Most industrial, scientific, military, and medical lasers are in this category. Medical lasers can have divergent emissions and require awareness of nominal ocular hazard distance (NOHD) and nominal ocular hazard area (NOHA).

Specifications are subject to change without notice.