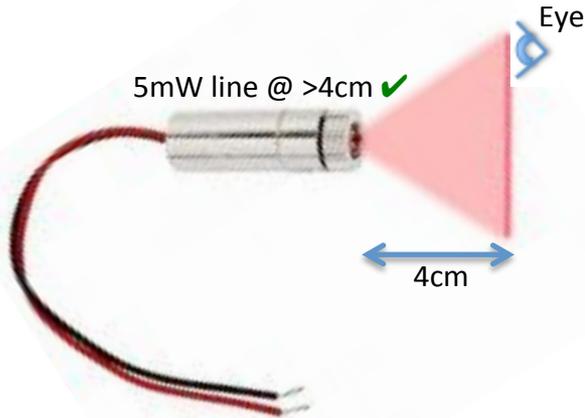


## Visible Line and Cross Lasers – Safe Working Distances for Accidental Exposure



For most visible lasers the maximum permissible exposure (MPE) is 1mW (Class 2 laser). If the laser is projecting a dot, all the laser output could reasonably enter the pupil of the eye.



For a line or cross laser at a distance, only a fraction of the light can enter the eye e.g. the exposure from a 5mW 90° line laser at 4cm distance would be <1mW. (10mm pupil)

Thus if a 5mW (Class 3R) laser is mounted in an enclosure or device so that it cannot be viewed at a distance of less than 4cm the maximum exposure would be normally be <1mW and the device would become Class 2M. (The “M” signifies that if the laser is viewed with an optical device such as a telescope the exposure could exceed Class 2.)

<u>Laser Type</u>	<u>Minimum Distance for &lt;1mW MPE* (Class 2M)</u>
1mW line laser	no minimum distance
5mW 90° line laser	3cm
50mW 90° line laser	30cm (~3R at 6cm)
100mW 90° line laser	60cm (~3R at 12cm)

- It is never recommended to directly look at a laser source, treat values as possible accidental exposure values.
- Class 3R lasers have a maximum exposure value of 5mW visible light
- Class 3B lasers have a maximum exposure of 500mW visible light

Disclaimer: This guidance is provided in good faith but users should verify all information for themselves before relying on it.

## Laser Classes

IEC60825 classifies laser products into different categories depending on light emitted, wavelength and eye safety. Classes for typical laser modules/diodes (with alternative and older classifications in brackets) are given below.

Note: Laser class labels show the maximum power not the actual power of a laser component.

### CLASS 2, 2M (~ US Class IIa, II)

"Caution", normally visible laser light less than 1.0mW. Considered eye safe, normal exposure to this type of beam will not cause permanent damage to the retina.

### CLASS 3R (~ US Class IIIa)

"Danger", visible laser light between 1.0mW and 5.0mW. Considered eye safe with caution. Focusing of this light into the eye could cause some damage.

### CLASS 3B (~ US Class IIIb)

"Danger", infrared (IR), and high power visible lasers <500mW.  
Considered dangerous to the retina if directly exposed.

### CLASS 4

"Danger" laser output power greater than 500 mW. Class 4 lasers are capable of causing injury to both the eye and skin and will also present a fire hazard if sufficiently high output powers are used.

NB: Our laser diode products are designed solely for use in OEM products. The way in which the device is used in the final product may alter its original design classification, and it is the responsibility of the OEM or user to ensure compliance with the relevant standards. Product descriptions give the power we measure in the conditions described and can act as a guide to class but NOT as a certification.

## Safety

Laser products emit intense laser light that can be harmful to the eyes and can cause burning by irradiation.

**NEVER DIRECT AT THE EYES EVEN AT A DISTANCE REGARDLESS OF LASER CLASS.**



## **General Supply Conditions for Laser Modules and Portable Lasers**

- You are over 18 years of age.
- You understand that laser components are dangerous when not properly assembled into a finished product and that Laser Class will vary with application and modification.
- You understand that laser modules, diodes etc. are an OEM product and need to be properly incorporated into a finished product per your local regulations.
- You will use these lasers in a safe and responsible manner and for a legal purpose.
- You are legally responsible for the use of these laser components or laser containing items and also the improper use of these components or their end products.
- You are legally responsible for any injury to anybody resulting from the use of or assembly of these components or their finished products.

You accept this laser as an OEM COMPONENT for integration in a product or a system of YOUR OWN design and will be legally responsible from any and all LIABILITIES.

-Our laser diodes and modules are supplied solely as OEM components for incorporation into the customer's end products. Since laser modules are a component they cannot comply with the appropriate requirements of FDA 21CFR, section 1040.10 and 1040.11 for complete laser products in the USA.

***If you have any concerns about laser safety or do not accept these conditions please return the unused product(s) in the original packing for a full refund.***