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MDL
Miniature Diode Laser



The ideal laser for OEM applications. The MDL offers size advantages not available in any other complete laser system. The ultra-miniature surface-mount electronics inside the MDL give you infrared or visible laser light with no external drive electronics required. These compact and rugged lasers withstand shock, electrical noise, and wide temperature ranges.

Optical Specifications

Nominal Wavelength (nm)	Output Power> (mW) @ 20° C	Beam Dimensions (FWHM) (mm)	Divergence (mrad 1/2 angle)	Longitudinal Mode	MTTF from Manufacturer (hrs)@ 20° C	Laser Class	Typical Current Draw (mA)	Voltage Input (VDC)	Laser Lead Config.
635	0.85	3.3 by 0.8	0.2 by 0.6	Undefined	48,000	II	32	4 - 6	Standard
635	2.75	3.3 by 0.8	0.2 by 0.6	Single	43,000	IIIa	35	4 - 6	Standard
635	4.25	3.3 by 0.8	0.2 by 0.6	Single	40,000	IIIa	37	4 - 6	Standard
650	3.00	3.3 by 0.8	0.2 by 0.6	Single	410,000	IIIa	33	4 - 6	Standard
660	30.00	1.7 by 0.6	0.2 by 0.6	Single	410,000	IIIb	100	4 - 6	Standard
670	0.85	3.3 by 0.8	0.2 by 0.6	Undefined	42,000	II	31	4 - 6	Standard
670	3.00	3.3 by 0.8	0.2 by 0.6	Single	37,000	IIIa	34	4 - 6	Standard
670	4.25	3.3 by 0.8	0.2 by 0.6	Single	32,000	IIIa	35	4 - 6	Standard
830	30.00	1.8 by 0.8	0.3 by 0.6	Single	209,000	IIIb	101	4 - 6	Reverse
850	8.5	3.3 by 1.0	0.3 by 0.5	Undefined		IIIb	59	4 - 6	Standard
980	10.00	2.8 by 0.6	0.3 by 0.8	Multiple	58,800	IIIb	47	4 - 6	Standard
1310	8.50	1.8 by 1.7	0.3 by 0.3	Multiple	10,000,000	IIIb	44	4 - 6	Standard
1550	5.00	1.8 by 1.8	0.3 by 0.4	Multiple	10,000,000	IIIb	43	4 - 6	Standard

Definitions of Specifications
NOMINAL WAVELENGTH:

Tolerances on diode laser wavelengths are typically ±10 nm, however, they can be as much as ±30 nm Please consult a LaserMax Sales for information on a specific module.

LONGITUDINAL MODE:

If a laser is listed as single mode, it will typically lase single mode once it has warmed up for roughly 30 minutes, if no optical feedback is present. During steady-state operation, wavelength typically drifts 0.25 nm per degree Celsius and will occasionally bring the laser to the interface between two longitudinal modes. These modes will then compete, interrupting single mode operation. To assure stable single mode operation, we

recommend using a thermoelectric cooler. Lasers listed as "multiple longitudinal mode" will typically lase with anywhere from 2 to 10 modes over a 1 to 10 nm envelope, depending on the laser. Multiple longitudinal mode lasers are less susceptible to intensity fluctuations due to feedback, and are useful in applications where a broad spectrum of output is desirable.

BEAM DIMENSIONS/ASPECT RATIO:

Beam dimensions listed are nominal full-width half-maximum values.

DIVERGENCE:

The intensity distribution of diode laser beams are generally elliptical. The far field divergence angles for both axes are dependent on the size of the beam as it leaves the laser. The smaller divergence angle is specified. For example, if a divergence specification is listed as 0.2 mrad half angle, and the elliptical aspect ratio is listed as 4, then the larger divergence angle will be nominally 0.8 mrad half angle.

BORE SIGHTING:

Laser beams are bore sighted to the front section of the laser housing (2 mrad for MDL and 0.5 mrad for LAS). Bore sighting specifications are null and void if the focusing lens is adjusted, or when the laser is equipped with accessories such as pattern generators or circularizers.

CURRENT DRAW:

These values are nominal, and changes as temperature changes to maintain constant laser output power. If a keybox is required for MDL, add 18 mA.

MODULATION:

All digital inputs to lasers must be TTL LINE DRIVER or equivalent to source enough current for top laser performance.

SAFETY RATING:

If you have questions about laser safety, contact LaserMax. You may also wish to visit the Food and Drug Administration's CDRH home page. Common sense is the most important element in any safety program. All lasers shipped meet all safety requirements of the FDA.

MEAN TIME TO FAILURE (MTTF):

This is the mean time to failure in hours of the laser diode as specified by the laser diode manufacturer @ 20° C. The MTTF will decrease rapidly with an increasing temperature. A rule of thumb for the MTTF is that for every reduction in junction temperature by 8° C, you can expect a doubling of the lifetime of the laser diode.

DEPTH OF MODULATION:

Power out of the laser module changes with the modulation of the signal voltage. See diagram

OUTPUT POWER:

Typical optical power out of the laser at 20° C. Output power will vary with temperature. For all of our lasers, we set the output power to ±5% from the specified value. After the laser has warmed up, the output power is stable to ±0.5% unless there is significant temperature changes. Typically it takes about 15 minutes for a diode laser to stabilize unless it is in a temperature controlled heat sink.

POLARIZATION:

A property of an electromagnetic wave that describes the orientation, i.e. time-varying direction and amplitude, of the electric field vector. Our lasers typically have better than 100 to 1 linear polarization ratios.

The electric field is polarized parallel to the major (long) axis of the elliptical beams at the output of our 635 nm lasers, but it is parallel to the minor (short) axis for our 650 to 830 lasers. The minor axis of the laser is aligned with the accessory screws on our LAS lasers. Use the orientation of the beam close to the laser as a reference. Due to the difference in the divergence of the two axes, the aspect ratio of the beam will change with distance from the laser.

REMEMBER:

Never allow your eyes or another person's eyes to be in the path of a laser beam, whether or not the laser is turned on. Ensuring this often means that beam guards must be erected to prevent exposure. Please call us if you have any questions or concerns!

All specifications subject to change without notice.

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