Datasheet
ELA350029-00

20mW 405nm LASER DIODE

ELA350029-00



Applications

- Optical lithography
- Metrology
- Biomedical
- Printing
- Holography

Light emission features

- Single transverse mode
- Linearly polarized
- Divergent free-space output

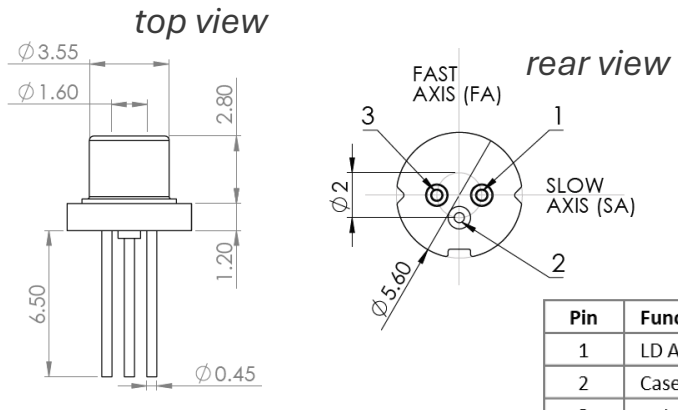
Maximum ratings

Parameter	Symbol	Cond	Min	Max	Unit
Output power	P			40	mW
Forward current	I_F	T = 25C		50	mA
Reverse voltage	V_R			-2	V
Forward voltage	V_F			6	V
Storage temperature	T_{stg}		-40	85	°C

Operating characteristics (Tcase: 25 °C)

Parameter	Symbol	Min	Typ	Max	Unit
Output power	P		20	30	mW
Forward current	I_F		35	45	mA
Forward voltage	V_F		4.3	4.8	V
Centre wavelength	λ	400	405	410	nm
Farfield slow axis (FWHM)	$\theta_{//}$	8	10	12	deg
Farfield fast axis (FWHM)	$\theta_{\perp}$	21	26	31	deg

TO-56 package (mm)



Pin	Function
1	LD ANODE (+)
2	Case, LD CATHODE (-)
3	not connected

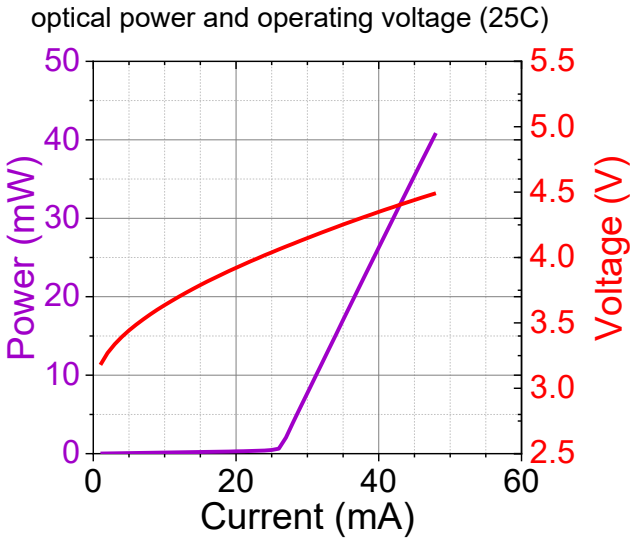
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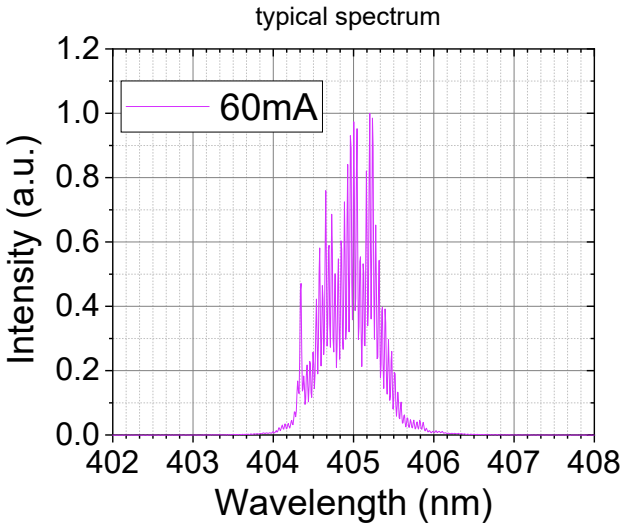
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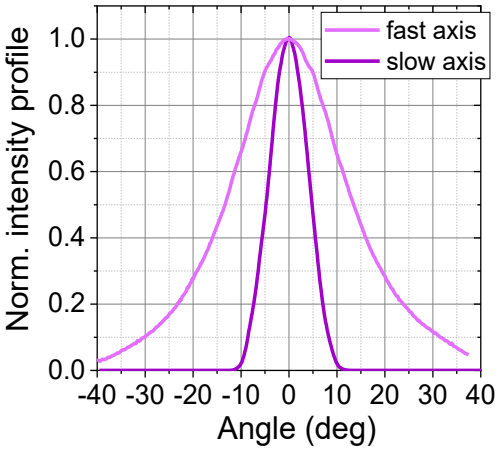
Typical curves

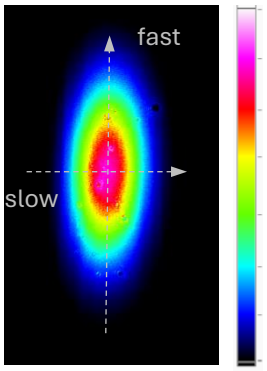
These characteristics are relative to a particular device under test.
Device to device variations may occur on a different set of samples.





far-field







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Pin/lead soldering

To prevent potential chip damage inside the module or reduced package hermeticity, it's advised that soldering time on the pins should be less than 10 s and the temperature below 250 °C.

Heatsinking

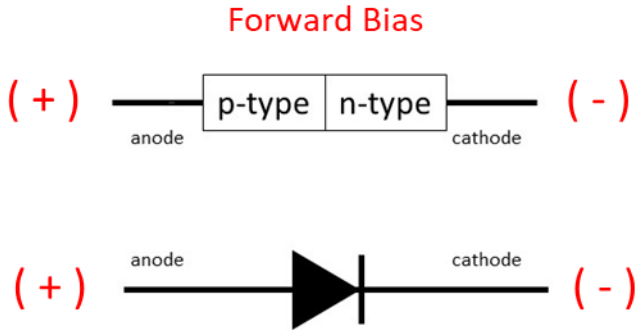
The modules must be mounted on a heat sink with low thermal resistance (<0.5K/W) and a good module/heatsink joint must be ensured. Simple pressure/contact over a smooth heatsink surface can be enough in most cases. However, a better thermal joint may include the use of thermal fillers. Insufficient module heatsinking will result in a temperature rise and may lead to a reduction of the performance or even permanent damage or total failure.

Please note that the individual specifications of the devices are given at a case temperature Tcase of 25°C. Even though the modules can be operated under passive heatsinking, much better power stability and reliable operation will be achieved when using a temperature-controlled heatsinking scheme.

Electrical Connections to LDs

LDs are pn junctions which need to be driven in forward bias. The p-side (LD anode) must have a positive voltage with respect to the n-side (LD cathode). Although the LD is capable of withstanding a reverse bias, this is not the correct operating mode and should be avoided.

Always ensure driver circuits are connected with the correct polarity. Positive polarity must be connected to the LD anode. Negative polarity must be connected to the LD cathode.





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Drive conditions

pn junctions in forward bias are very sensitive to voltage. Small voltage changes can give rise to high current changes and it is very easy to exceed absolute maximum current and/or output power ratings if the LD is driven with a controlled constant voltage source.

The absolute maximum ratings reported in the data sheets must be carefully observed. Any value exceeding the specified parameters should be avoided, otherwise permanent damage may result. Independent of operating temperature, never exceed maximum allowed LD current, voltage or output power.

EXALOS offers driver boards designed specifically to operate LDs. Please contact EXALOS to discuss these products. Alternatively, most 3rd party drivers designed for semiconductor lasers will work with EXALOS LDs. Always take great care to ensure that 3rd party or custom designed circuits match the required maximum drive currents for the purchased products and have appropriate protections against electrostatic discharge or fast current/voltage transients.

It is strongly advised that the modules are driven with a current source. Constant controlled voltage mode exposes the module to the risk of exceeding the maximum current and output power limits. Take all precautions needed if voltage drive mode is strictly required ***(e.g. start operation at ½ of max. voltage ratings, then increase voltage in steps < 50mV while carefully monitoring the drive current).***

Electrostatic Discharge (ESD) and Surge Current

LDs are sensitive to electrostatic shock/discharge. Ensure you are working in an ESD certified zone with appropriate ESD protection in place before you handle the modules. Tools such as soldering irons used during assembly must be appropriately protected against ESD.

Surge current or over current in the forward or reverse direction may permanently damage the diode. Use only laser-diode power supplies or constant current power supplies that can guarantee controlled current levels and prevent the LD to be overdriven even for very short periods of time. Make sure that all the wiring and electrical connections around the module are stable and functional.



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