

High Power Density 1 W Laser Diode

Description

The SLD323XT is a high power, gain-guided laser diode produced by MOCVD method\*. Compared to the SLD300 Series, this laser diode has a high brightness output with a doubled optical density which can be achieved by QW-SCH structure\*\*.

Temperature of laser diode is controlled by using built-in T.E. Cooler and wavelength can be tuned exactly by this temperature control.

\*1 MOCVD : Metal Organic Chemical Vapor Deposition

\*2 QW-SCH : Quantum Well Separate Confinement Heterostructure

Features

- High power  
Recommended optical power output:  $P_o=1.0\text{ W}$
- Low operating current:  $I_{op}=1.4\text{ A}$  ( $P_o=1.0\text{ W}$ )
- Flat package with built-in photodiode, TE cooler, and thermistor

Applications

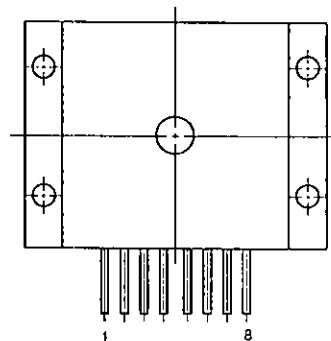
- Solid state laser excitation
- Medical use
- Material processes
- Measurement

Structure

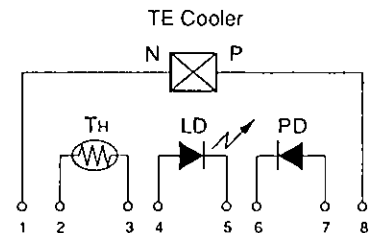
GaAlAs quantum well structure laser diode

Pin Configuration (Top View)

No.	Function
1	TE cooler, negative
2	Thermistor lead 1
3	Thermistor lead 2
4	Laser diode anode
5	Laser diode cathode
6	Photo diode cathode
7	Photo diode anode
8	TE cooler, positive

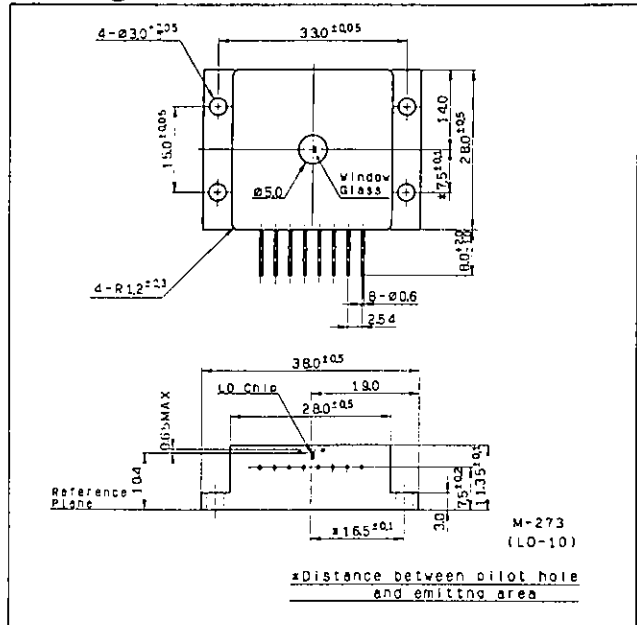


Equivalent Circuit



Package Outline

Unit : mm



Absolute Maximum Ratings (T<sub>th</sub>=25°C)

- Optical power output  $P_o$  1.1 W
- Reverse voltage  $V_{r LD}$  2 V
- PD 15 V
- Operating temperature (T<sub>th</sub>) Topr -10 to +30 °C
- Storage temperature Tstg -40 to +85 °C
- Operating current of  $I_r$  2.5 A  
TE cooler

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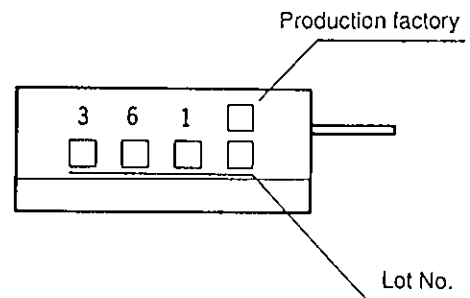
**Optical and Electrical Characteristics** (T<sub>th</sub>=thermistor temperature T<sub>th</sub>=25 °C)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit.			
Threshold current	I <sub>th</sub>			0.3	0.5	A			
Operating current	I <sub>op</sub>	P <sub>o</sub> =1.0 W		1.4	2.0	A			
Operating voltage	V <sub>op</sub>	P <sub>o</sub> =1.0 W		2.1	3.0	V			
Wavelength ☆	λ	P <sub>o</sub> =1.0 W	790		840	nm			
Monitor current	I <sub>mon</sub>	P <sub>o</sub> =1.0 W V <sub>R</sub> =10 V	0.3	1.5	6.0	mA			
Radiation angle (F. W. H. M)	Perpendicular	P <sub>o</sub> =1.0 W				20	30	40	degree
	Parallel					4	9	17	degree
Positional accuracy	Position	P <sub>o</sub> =1.0 W						±100	μm
	Angle							±3	degree
Differential efficiency	η <sub>D</sub>	P <sub>o</sub> =1.0 W	0.5	0.9				W/A	
Thermistor resistance	R <sub>th</sub>	T <sub>th</sub> =25°C		10				kΩ	

☆ **Wavelength Classification**

Type	Wavelength (nm)
SLD323XT-1	795±5
SLD323XT-2	810±10
SLD323XT-3	830±10
SLD323XT-21	798±3
SLD323XT-24	807±3
SLD323XT-25	810±3

**Marking**

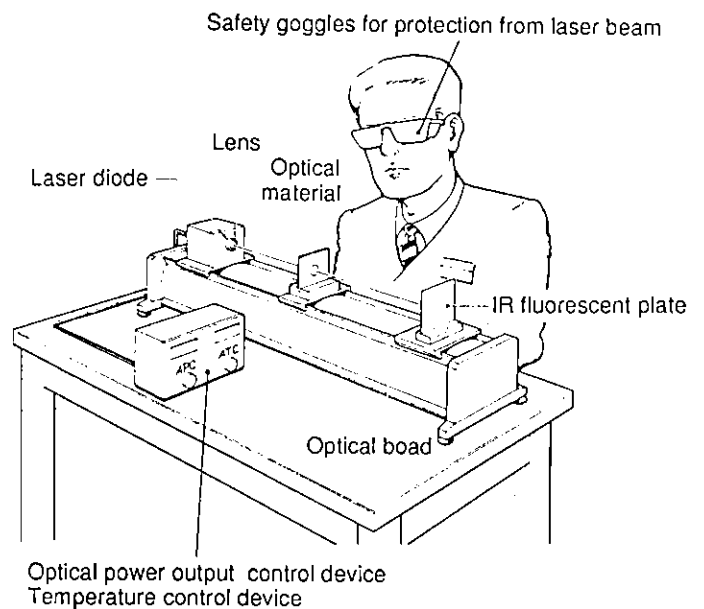


**Handling Precautions**

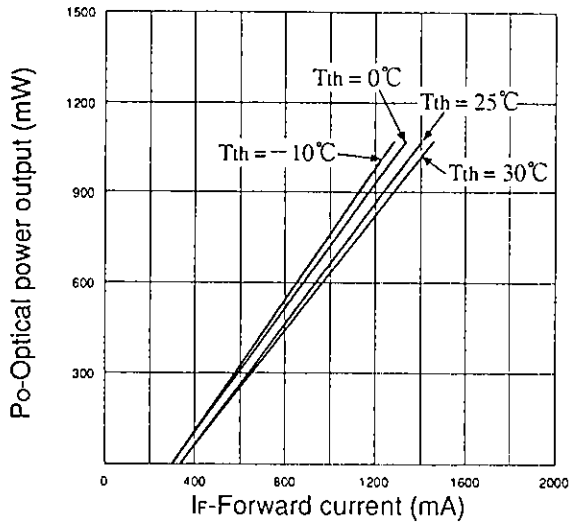
Eye protection against laser beams

The optical output of laser diodes ranges from several mW to 3 W. However the optical power density of the laser beam at the diode chip reaches 1 MW/cm<sup>2</sup>. Unlike gas lasers, since laser diode beams are divergent, uncollimated laser diode beams are fairly safe at a laser diode. For observing laser beams, ALWAYS use safety goggles that block infrared rays. Usage of IR scopes, IR cameras and fluorescent plates is also recommended for monitoring laser beams safely.

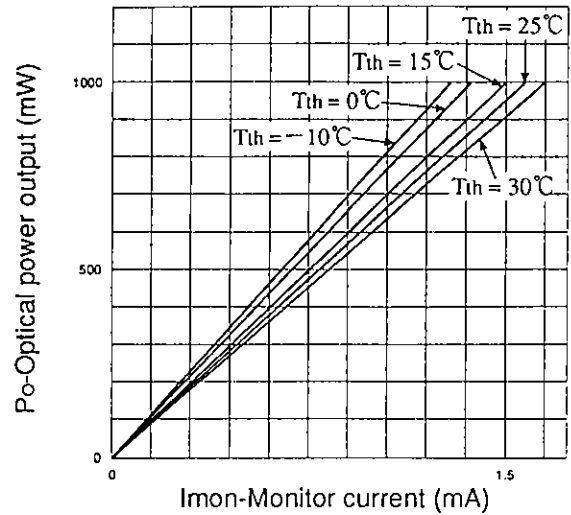
\* Categories are not specified by marking



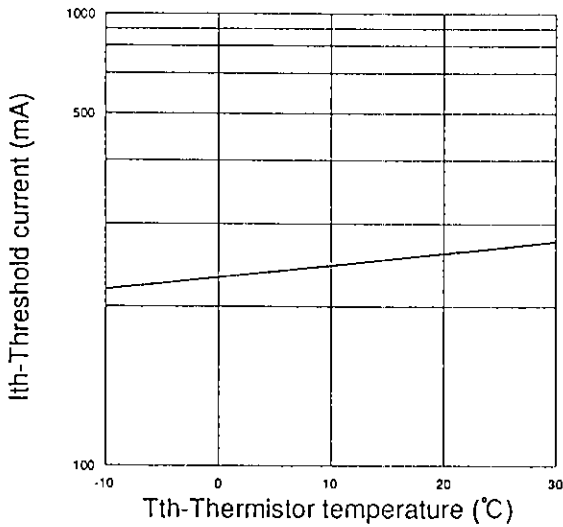
Optical power output vs. Forward current characteristics



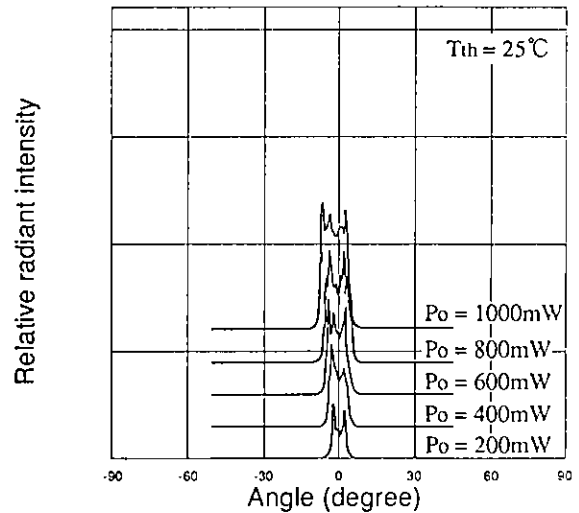
Optical power output vs. Monitor current characteristics



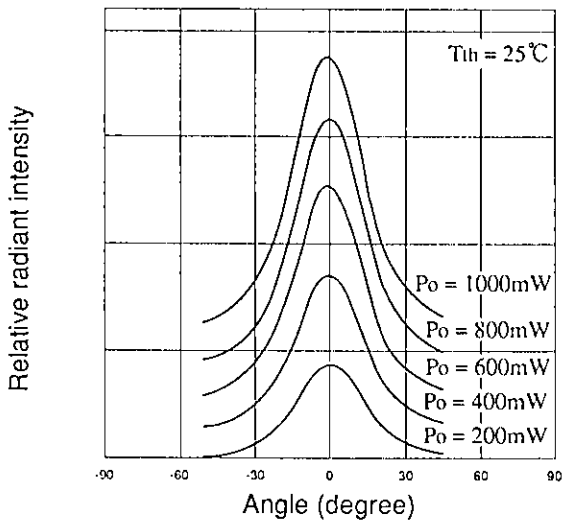
Threshold current vs. Temperature characteristics



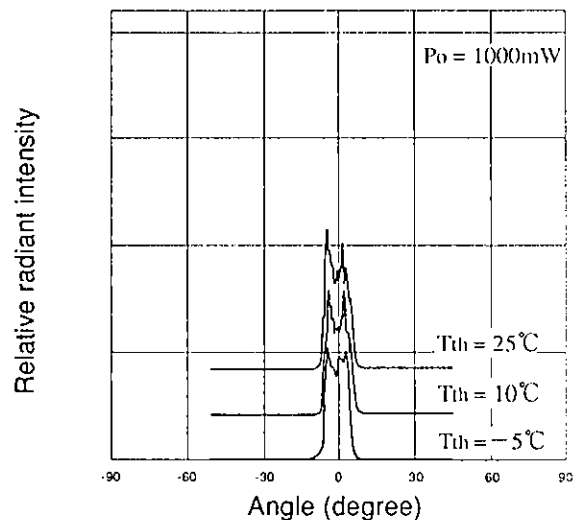
Power dependence of far field pattern (Parallel to junction)



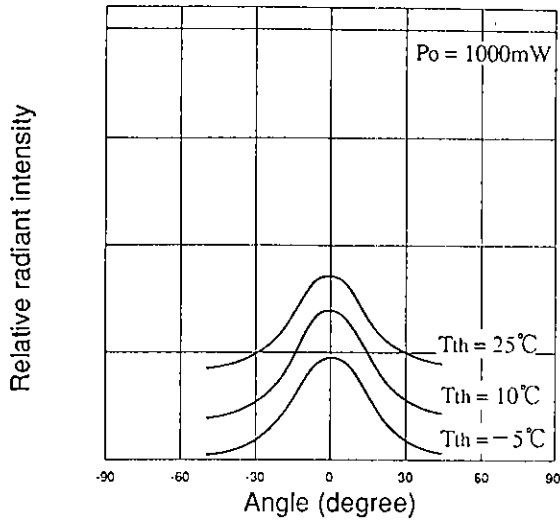
Power dependence of far field pattern (Perpendicular to junction)



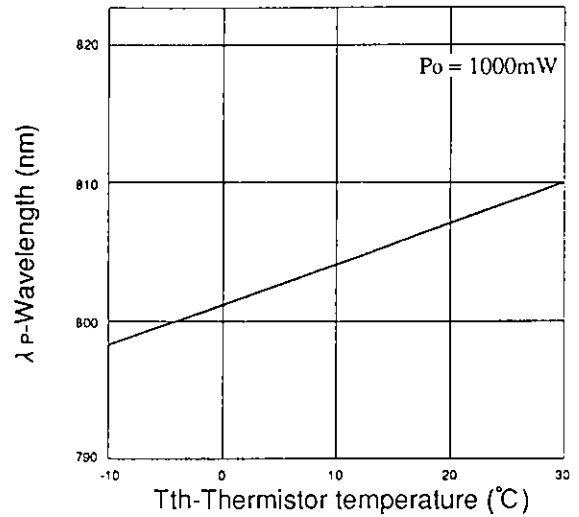
Temperature dependence of far field pattern (Parallel to junction)



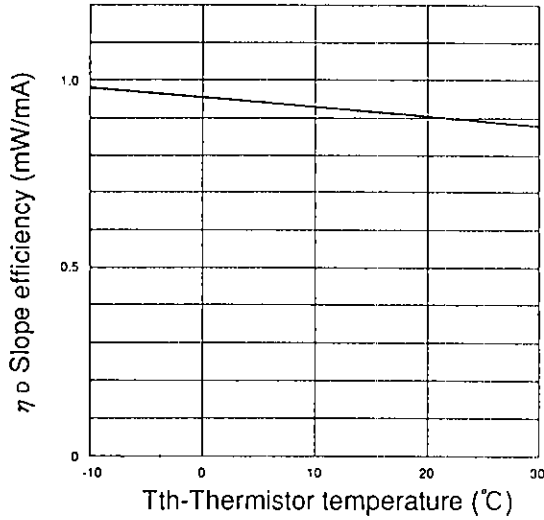
Temperature dependence of far field pattern (Perpendicular to junction)



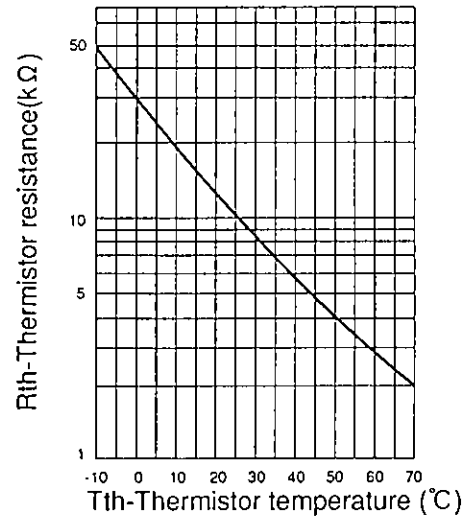
Dependence of wavelength



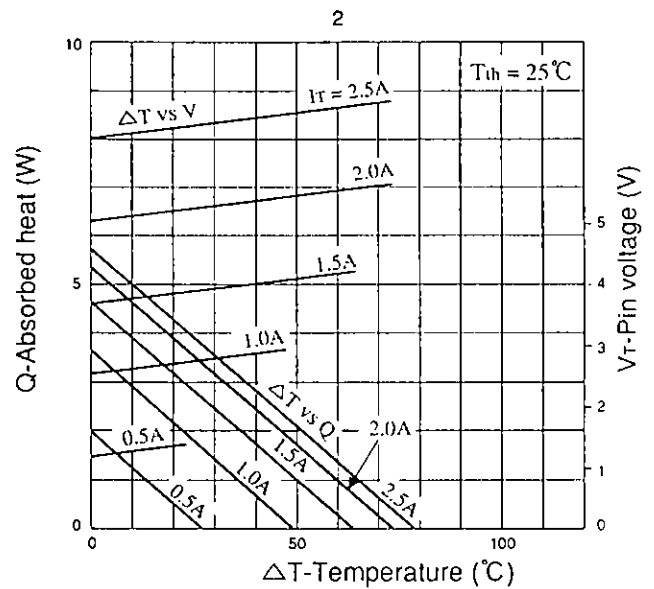
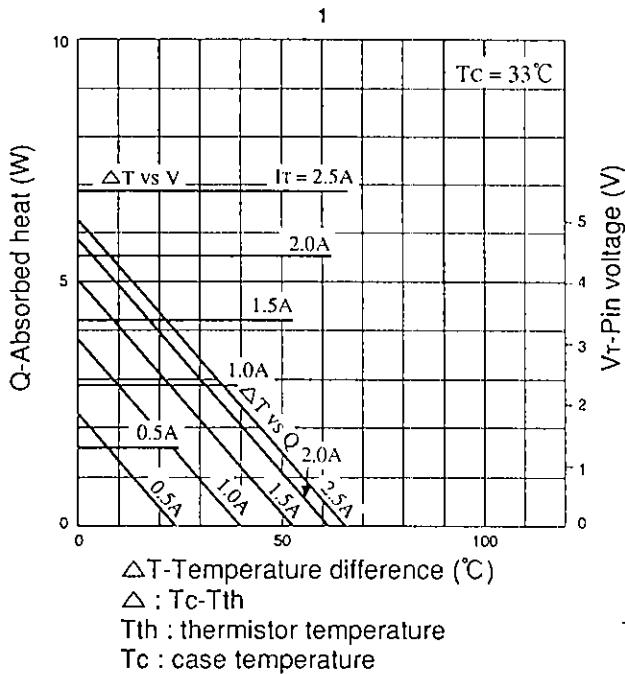
Slope efficiency vs. Temperature characteristics



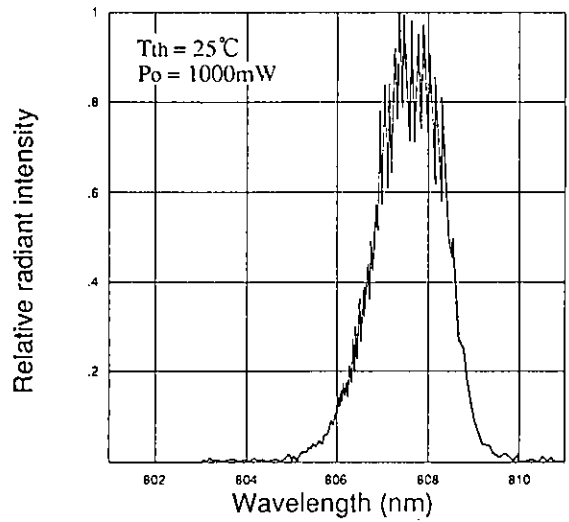
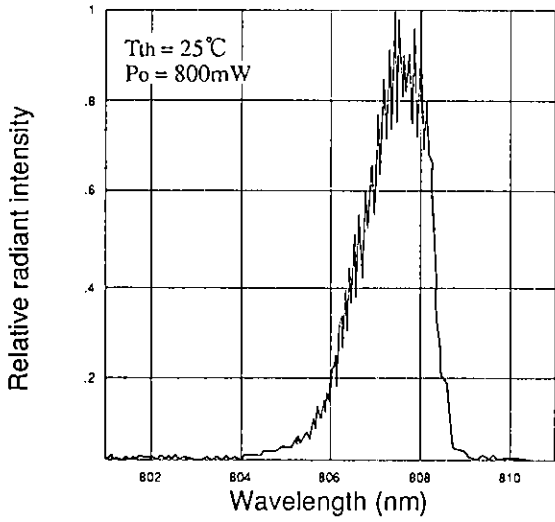
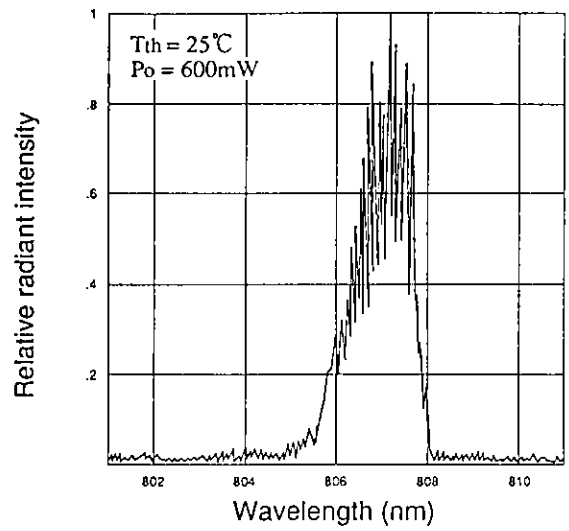
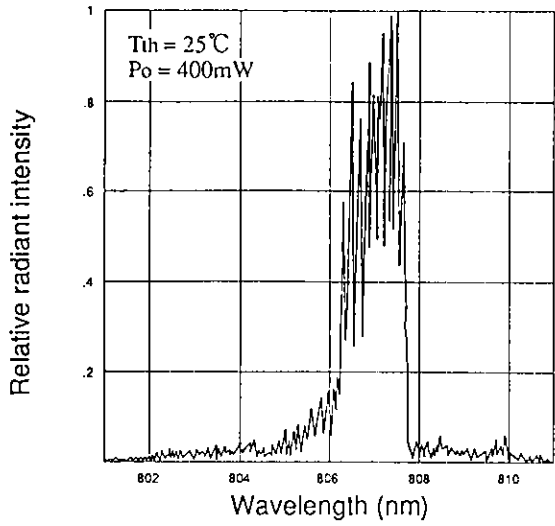
Thermistor characteristics



TE cooler characteristics



Power dependence of spectrum



Temperature dependence of spectrum ( $P_o=0.5\text{ W}$ )

