

500mW High Power Laser Diode

Description

SLD303XT is a gain-guided, high-power laser diode with a built-in TE cooler. A new flat, square package with a low thermal resistance and an in-line pin configuration is employed.

Fine tuning of the wavelength is possible by controlling the laser chip temperature.

Features

- High power
Recommended power output $P_o=450\text{mW}$
- Small operating current
- Newly developed flat package with built-in TE cooler, thermistor and photodiode.

Structure

GaAlAs double-hetero laser diode

Applications

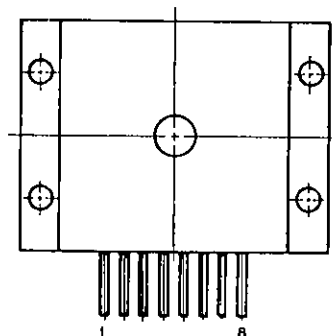
- Solid state laser excitation
- Medical use

Absolute Maximum Ratings ($T_{th}=25^{\circ}\text{C}$)

• Radiant power output	P_o		500	mW
• Reverse voltage	V_R	LD	2	V
		PD	15	V
• Operating temperature	T_{opr}		-10 to +30	$^{\circ}\text{C}$
• Storage temperature	T_{stg}		-40 to +85	$^{\circ}\text{C}$
• Operating current of TE cooler	I_T		2.5	A

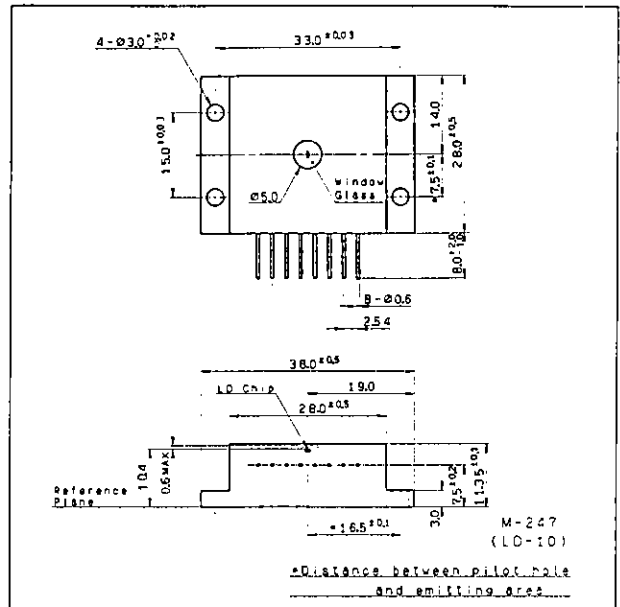
Pin Configuration (Top View)

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

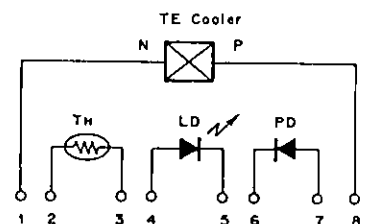


Package Outline

Unit: mm



Equivalent Circuit



Optical and Electrical Characteristics

 $T_{th}=25^{\circ}\text{C}$

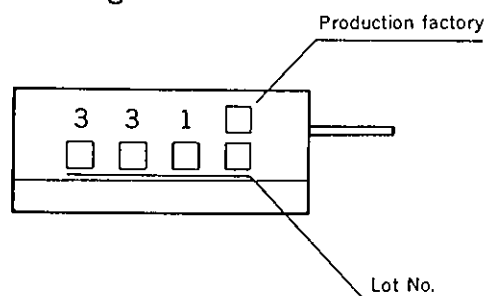
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Threshold current	I_{th}			450	600	mA
Operating current	I_{OP}	$P_o=450\text{mW}$		950	1500	mA
Operating voltage	V_{OP}	$P_o=450\text{mW}$		1.9	3.0	V
Wavelength*	λ_p	$P_o=450\text{mW}$	770		840	nm
Monitor current	I_{mon}	$P_o=450\text{mW}$ $V_R=10\text{V}$		0.8		mA
Radiation angle (F. W. H. M)	Perpendicular	$\theta_{\perp}$	$P_o=450\text{mW}$	28	40	degree
	Parallel	$\theta_{\parallel}$		12	17	degree
Positional accuracy	Position	$\Delta X, \Delta Y$	$P_o=450\text{mW}$		± 100	μm
	Angle	$\Delta \phi_{\perp}$			± 3	degree
Slope efficiency	η_D	$P_o=450\text{mW}$	0.65	0.9		mW/mA
Thermistor resistance	R_{th}	$T_{th}=25^{\circ}\text{C}$		10		k Ω

Note) T_{th} : Thermistor temperature

*Wavelength Selection Classification

Type	Wavelength (nm)
SLD303XT-1	785 ± 15
SLD303XT-2	810 ± 10
SLD303XT-3	830 ± 10
SLD303XT-21	798 ± 3
-24	807 ± 3
-25	810 ± 3

Marking

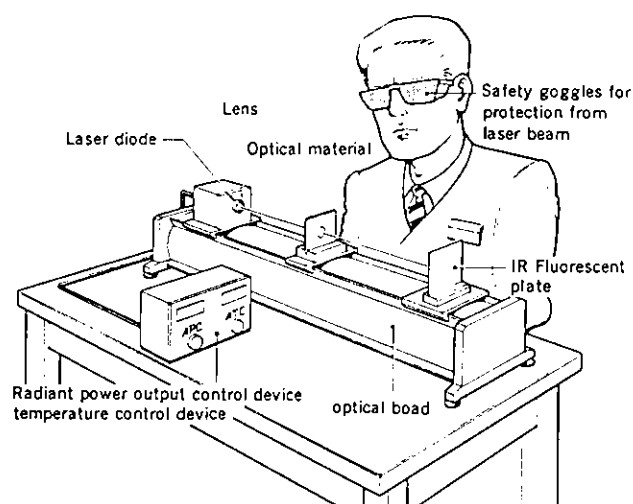


Handling Precautions

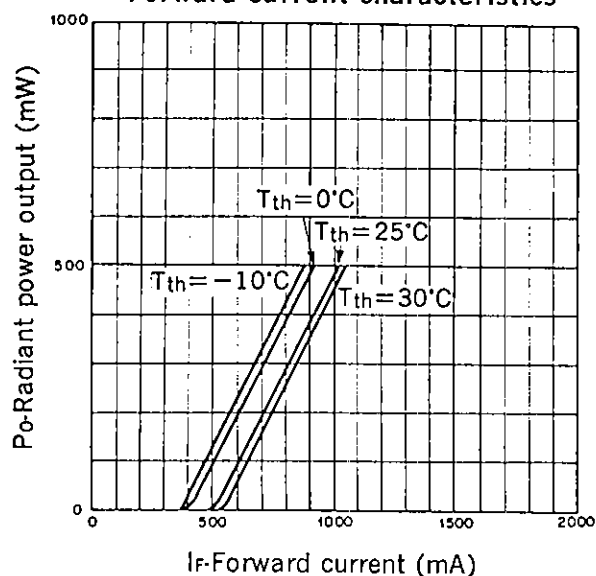
Eye protection against laser beams

The optical output of laser diodes ranges from several milliwatts to one watt. However the optical density of the laser beam at the diode chip reaches 1 megawatt per square centimeter. 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.

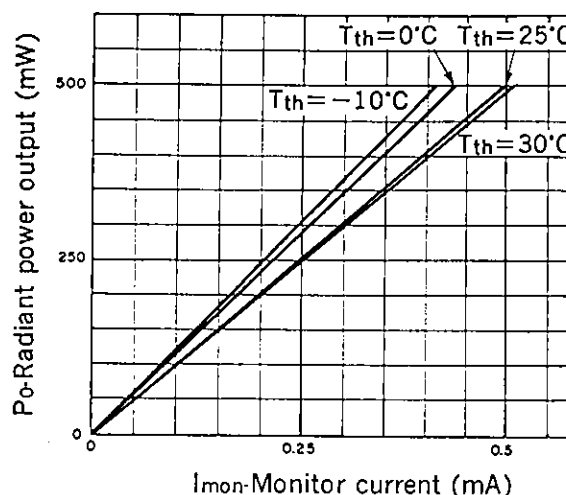
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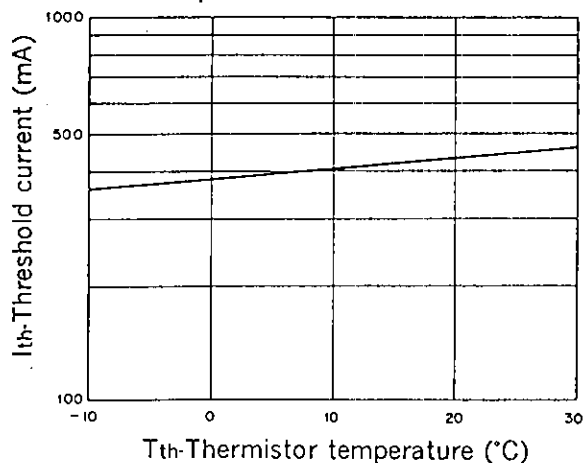
Radiant power output vs.
Forward current characteristics



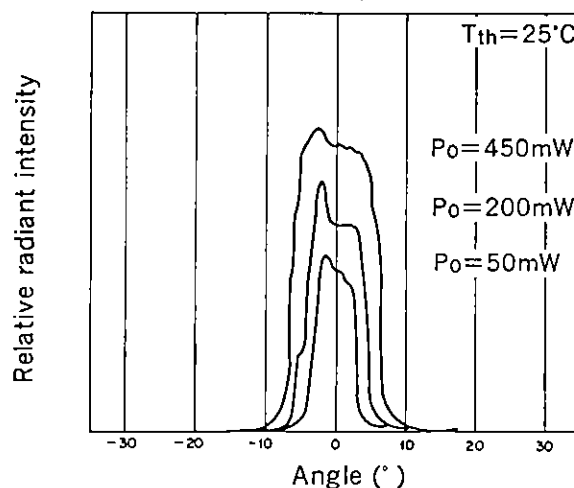
Radiant power output vs.
Monitor current characteristics



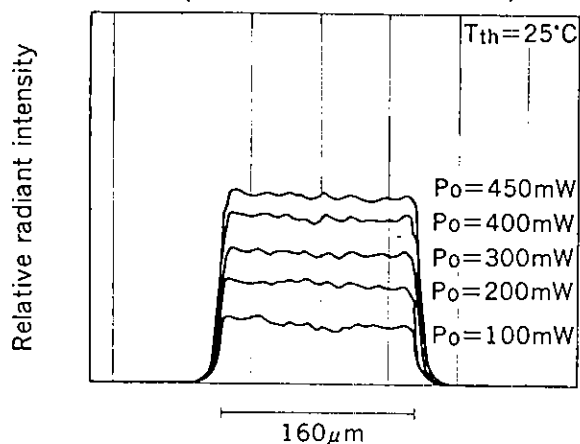
Threshold current vs.
Temperature characteristics



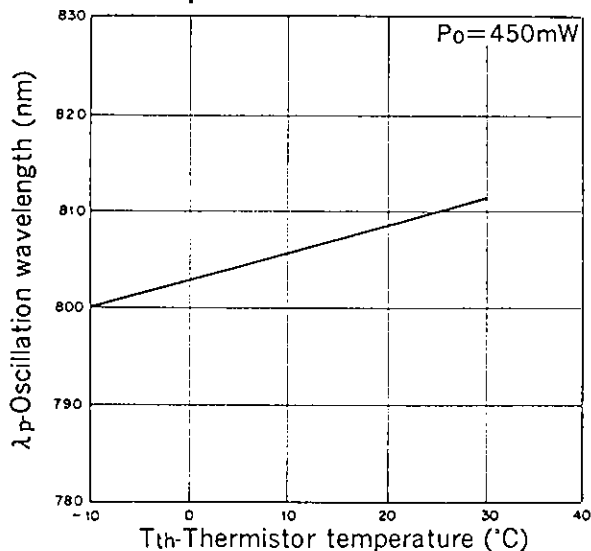
Power dependence of far field pattern
(parallel to junction)



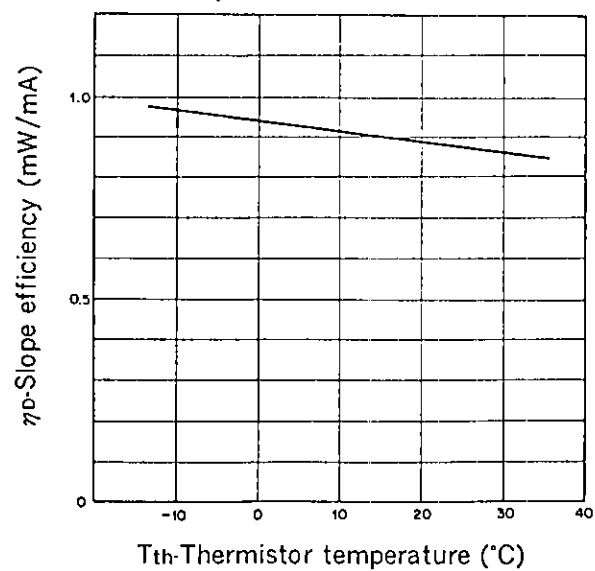
Power dependence of near field pattern



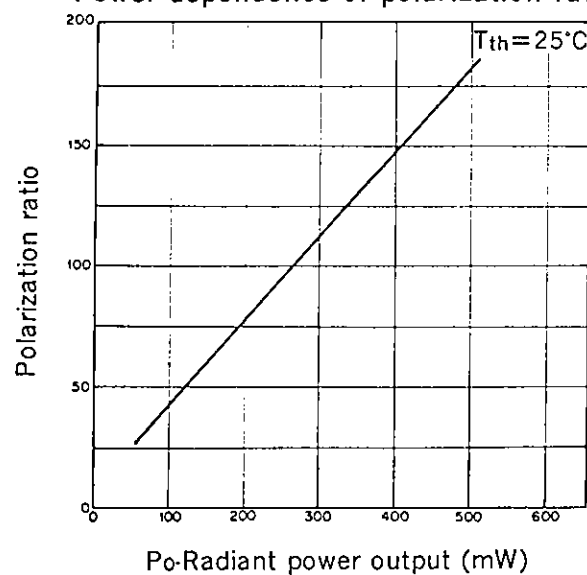
Oscillation wavelength vs.
Temperature characteristics



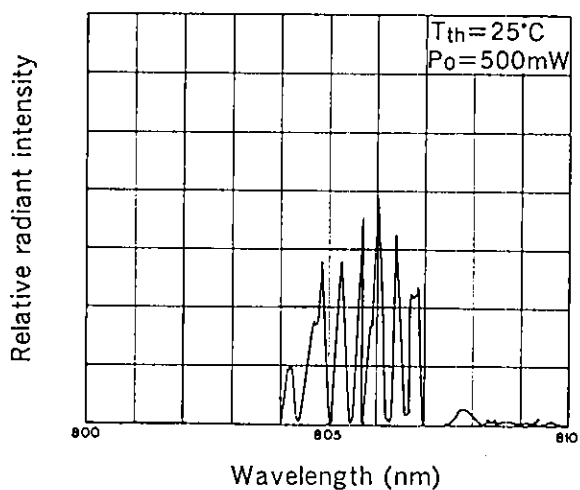
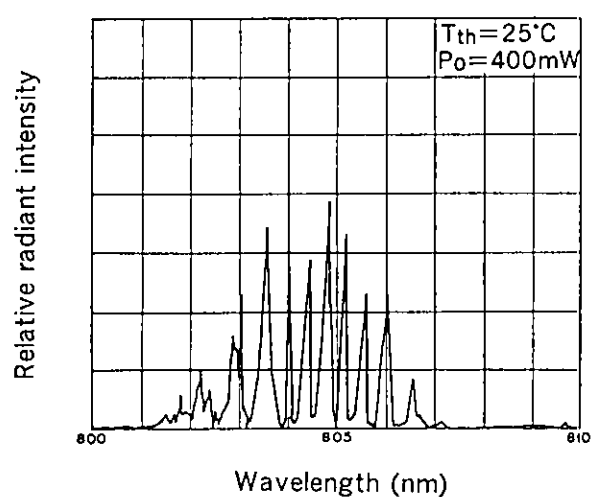
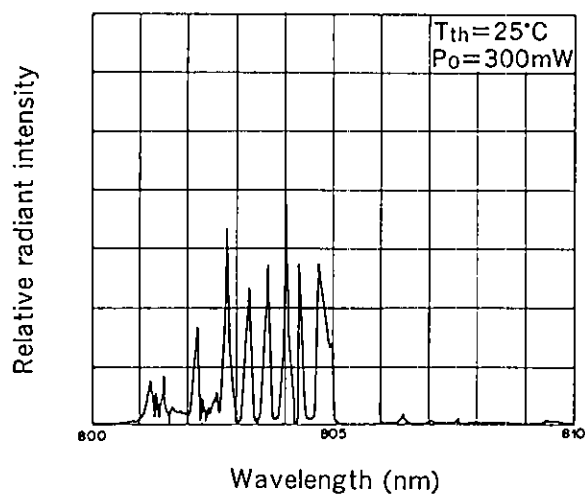
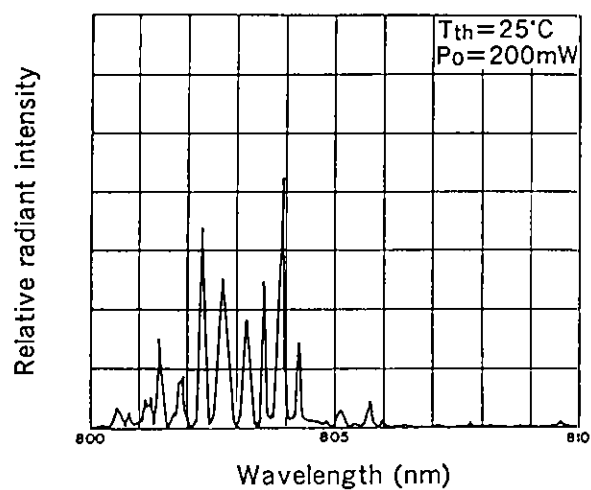
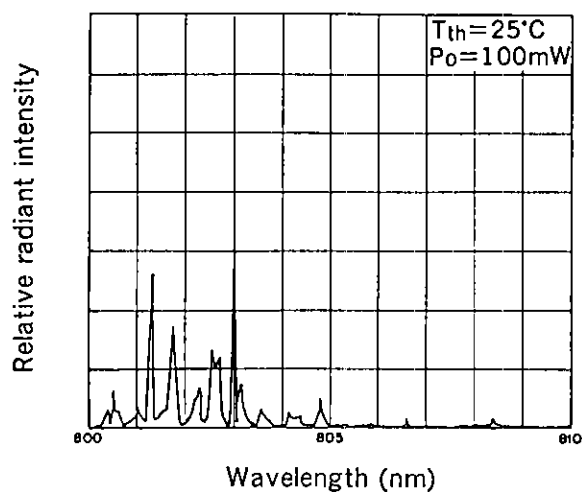
Slope efficiency vs.
Temperature characteristics

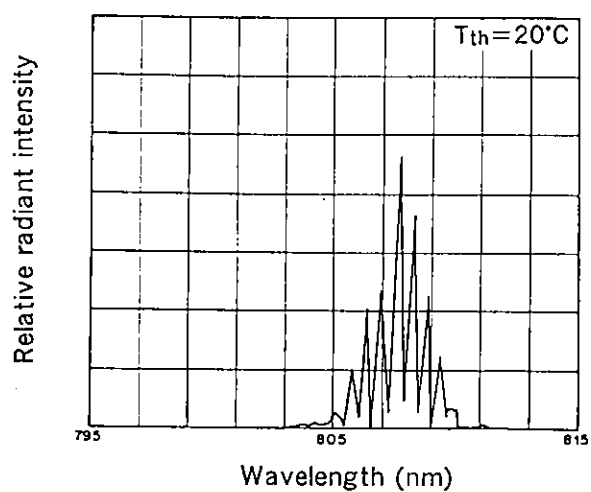
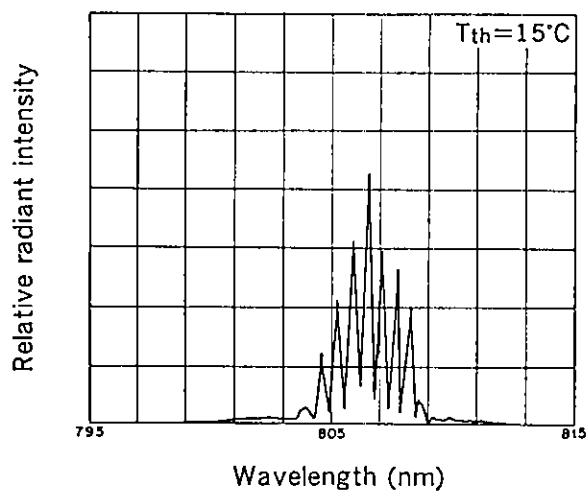
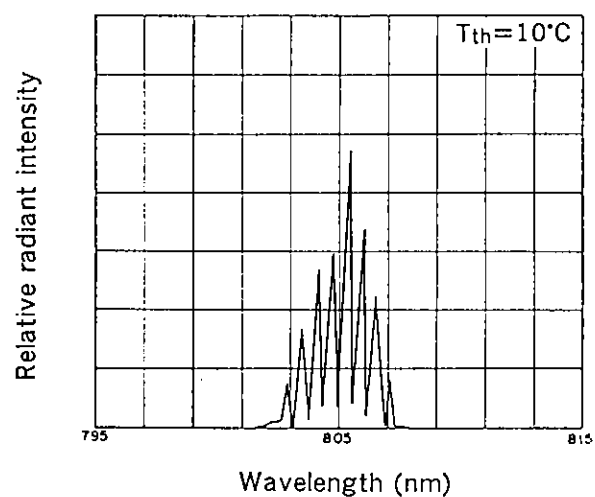
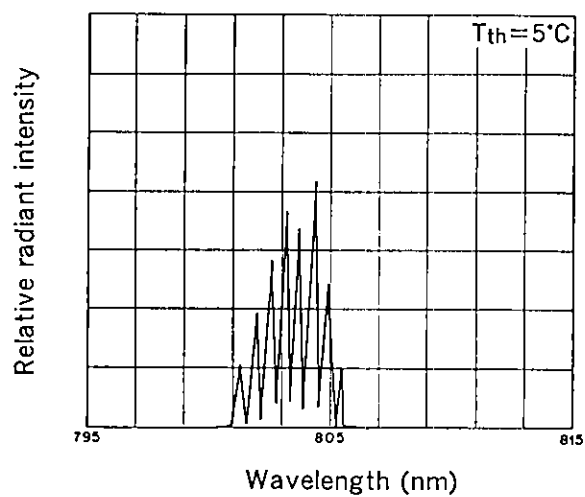
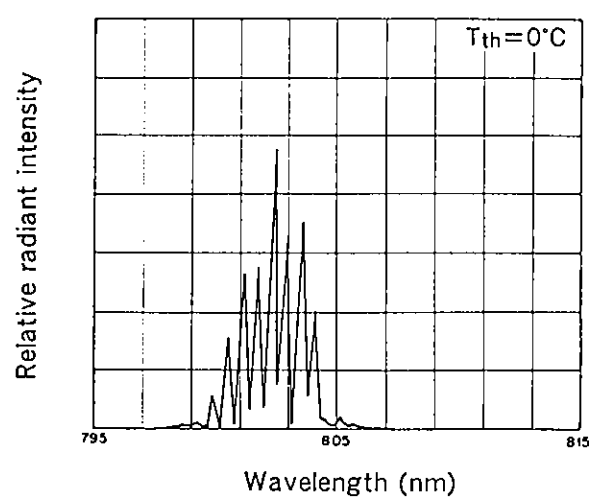
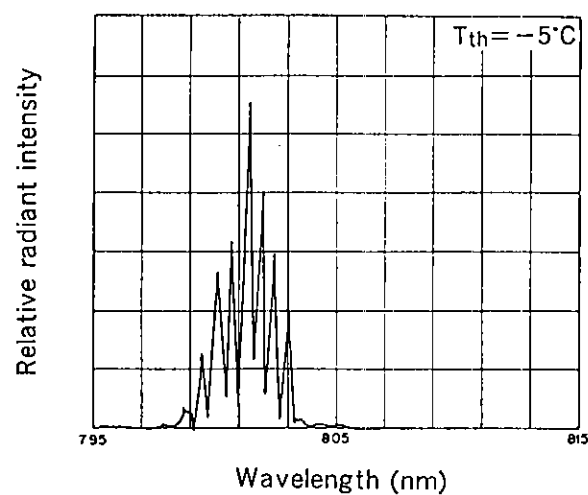


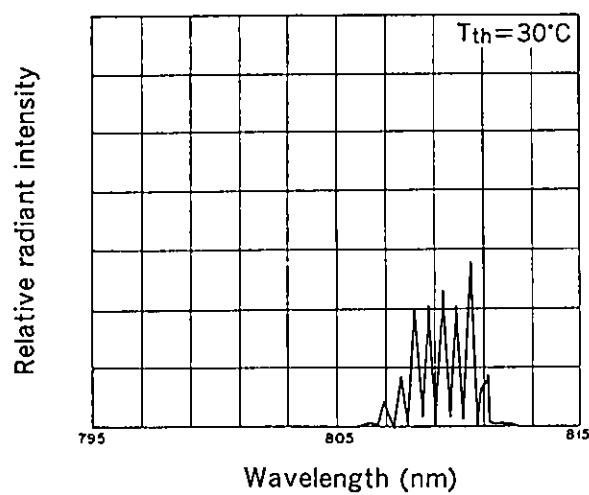
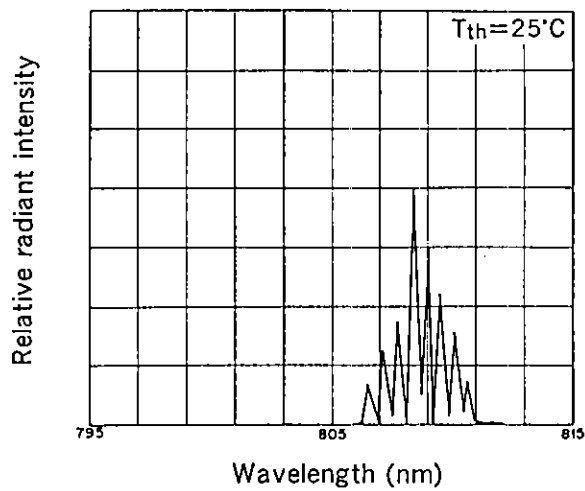
Power dependence of polarization ratio



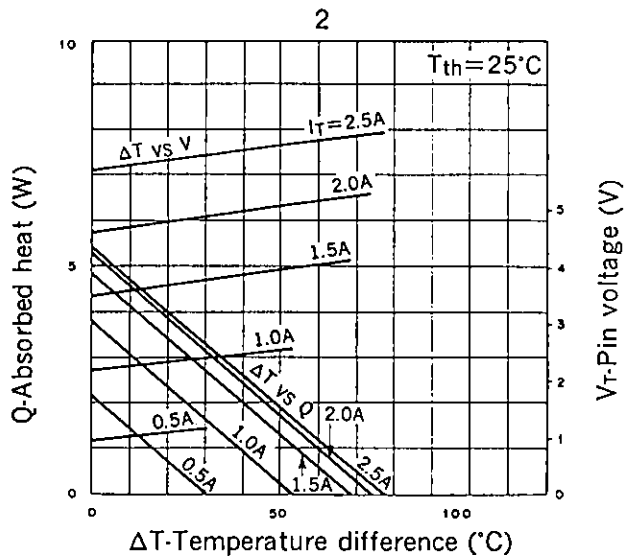
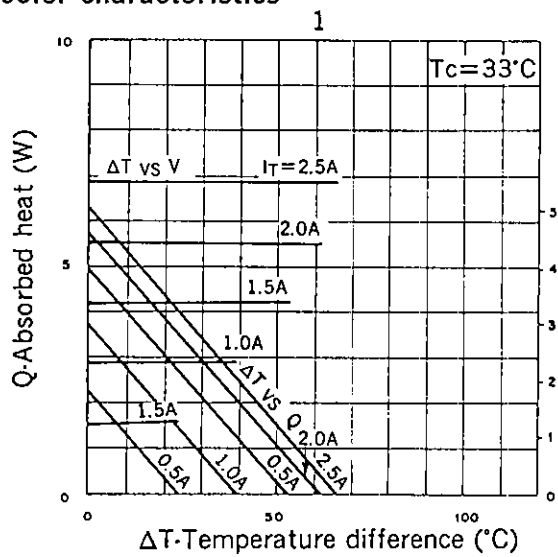
Power dependence of wavelength



Temperature dependence of wavelength ($P_o=450\text{mW}$)

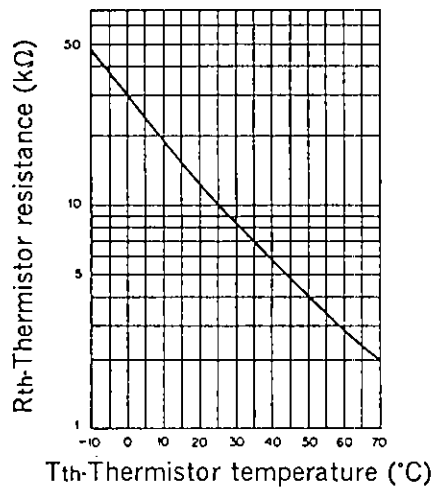


TE cooler characteristics



ΔT : $T_c - T_{th}$
 T_{th} : Thermistor temperature
 T_c : Case temperature

Thermistor characteristics



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