

100mW High Power Laser Diode

Description

SLD301WT is a gain-guided, high-powered laser diode with a built-in TE cooler. Fine tuning of the wavelength is possible by controlling the laser chip temperature.

Features

- High power
Recommended power output $P_o=90\text{mW}$
- Small operating current
- TO-3 package with built-in TE cooler, thermistor, and photodiode

Structure

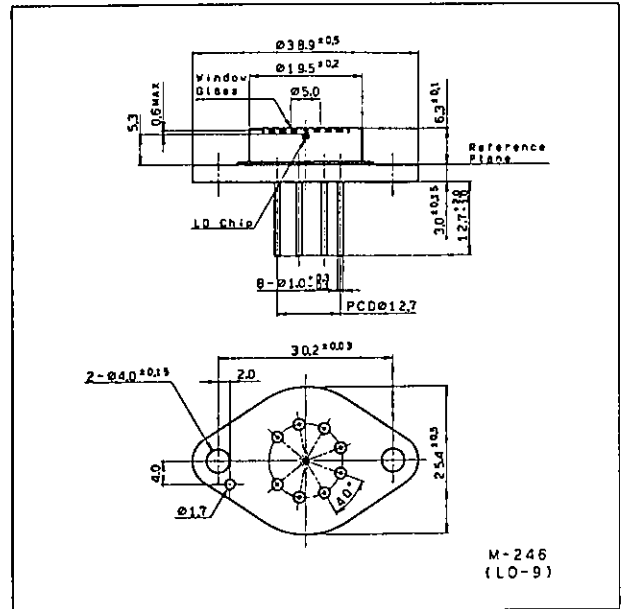
GaAlAs double-hetero laser diode

Applications

- Solid state laser excitation
- Medical use

Package Outline

Unit: mm

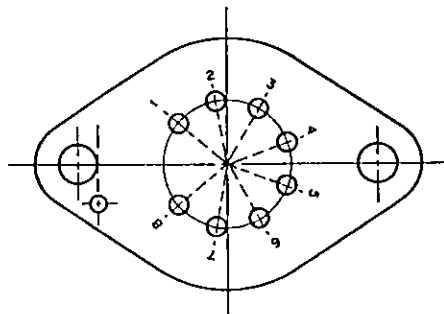


Absolute Maximum Ratings ($T_{th}=25^{\circ}\text{C}$)

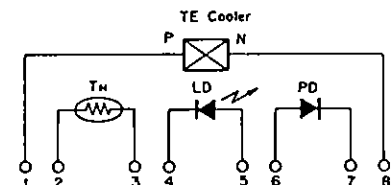
• Radiant power output	P_o	LD	100	mW
• Reverse voltage	V_R	LD	2	V
		PD	15	V
• Operating temperature	T_{opr}		-10 to +50	$^{\circ}\text{C}$
• Storage temperature	T_{stg}		-40 to +85	$^{\circ}\text{C}$
• Operating current of TE cooler	I_T		2.1	A

Pin Configuration (Bottom View)

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



Equivalent Circuit



Optical and Electrical Characteristics

T_{th} = 25°C

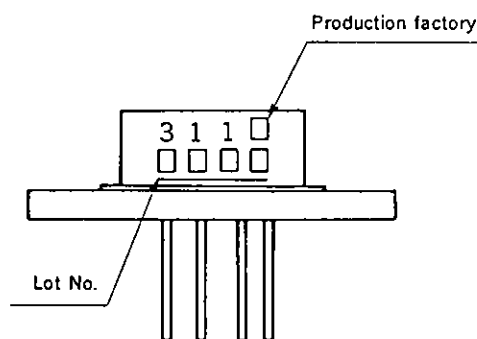
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Threshold current	I _{th}			150	200	mA
Operating current	I _{OP}	P _o = 90mW		250	400	mA
Operating voltage	V _{OP}	P _o = 90mW		1.9	3.0	V
Wavelength*	λ _p	P _o = 90mW	770		840	nm
Monitor current	I _{mon}	P _o = 90mW V _R = 10V		0.15		mA
F. W. H. M	Perpendicular	θ _⊥	P _o = 90mW	28	40	degree
	Parallel			θ	12	17
Positional accuracy	Position	ΔX, ΔY	P _o = 90mW		±100	μm
	Angle			Δφ _⊥		±3
Slope efficiency	η _o	P _o = 90mW	0.65	0.9		mW/mA
Thermistor resistance	R _{th}	T _{th} = 25°C		10		kΩ

Note) T_{th}: Thermistor temperature

*Wavelength Selection Classification

Type	Wavelength (nm)
SLD301WT-1	785 ± 15
SLD301WT-2	810 ± 10
SLD301WT-3	830 ± 10
SLD301WT-21	798 ± 3
-24	807 ± 3
-25	810 ± 3

Marking

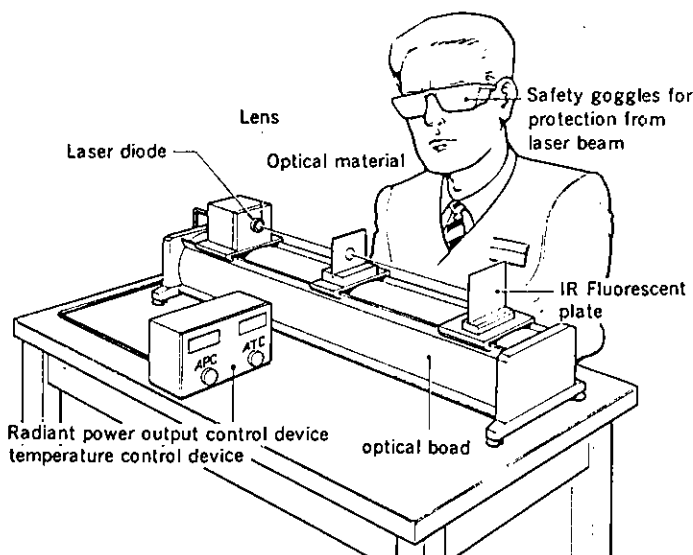


* Categories are not specified by marking.

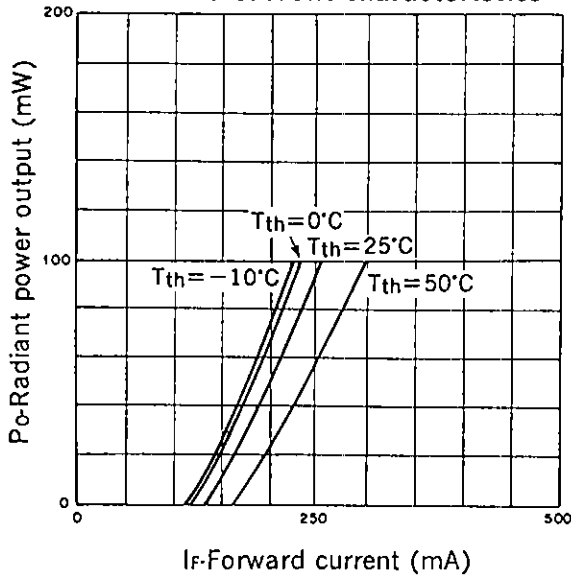
Handling Precautions

Eye protection against laser beams

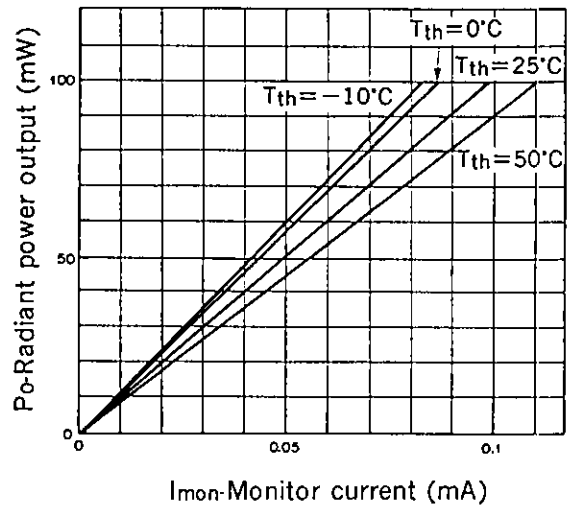
The optical output of laser diodes ranges from several milliwatts to one watt. However the optical density of the laser beam at the tip end reaches 1 megawatt per square centimeter. Unlike gas lasers, as laser diode beams are rather divergent, beam of uncollimated laser diodes are fairly safe at a distance. Generally speaking, however, it is best NOT to LOOK into laser beams, under any circumstances. For laser beams observation purposes ALWAYS use safety goggles that block infrared rays. Usage of 1R scopes, 1R cameras and fluorescent plates is also recommended for the safe monitoring of laser beams.



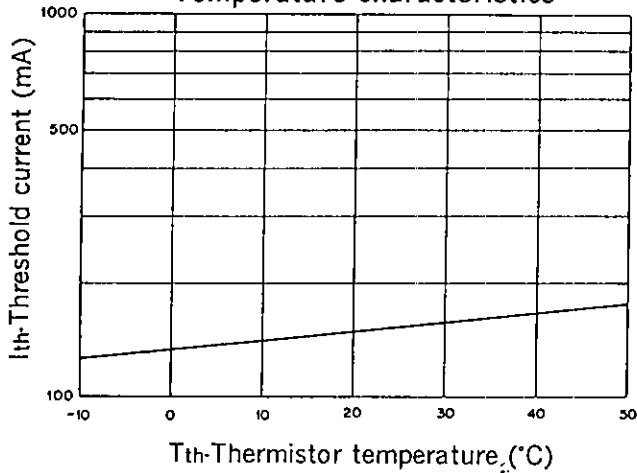
Radiant power output vs. Forward current characteristics



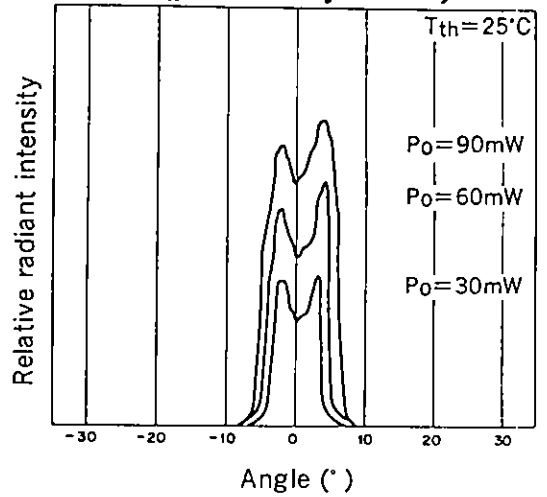
Radiant power output vs. Monitor current characteristics



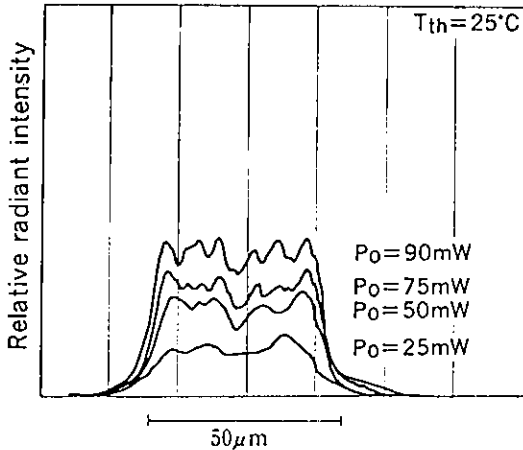
Threshold current vs. Temperature characteristics



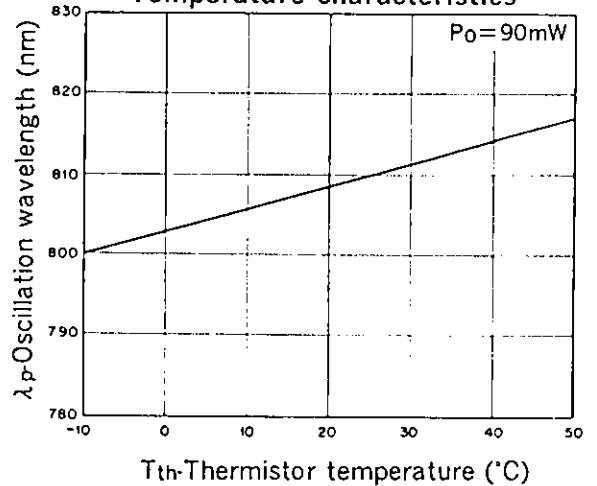
Power dependence of far field pattern (parallel to junction)



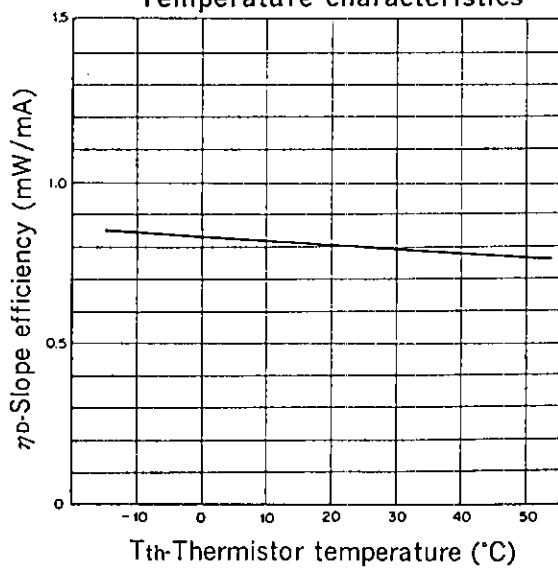
Power dependence of near field pattern



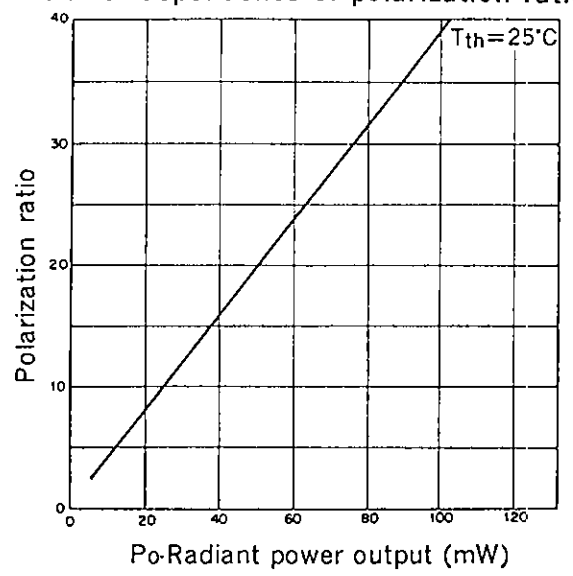
Oscillation wavelength vs. Temperature characteristics



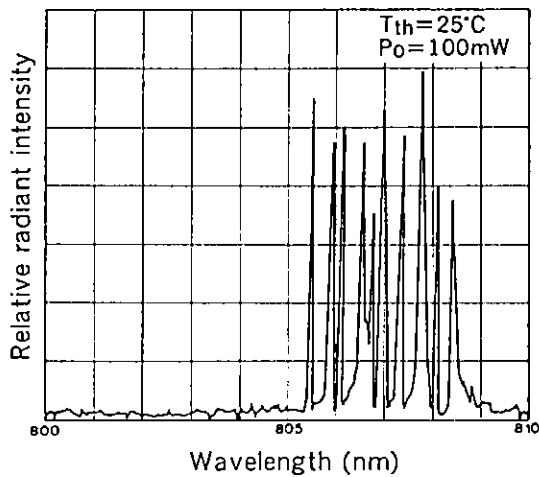
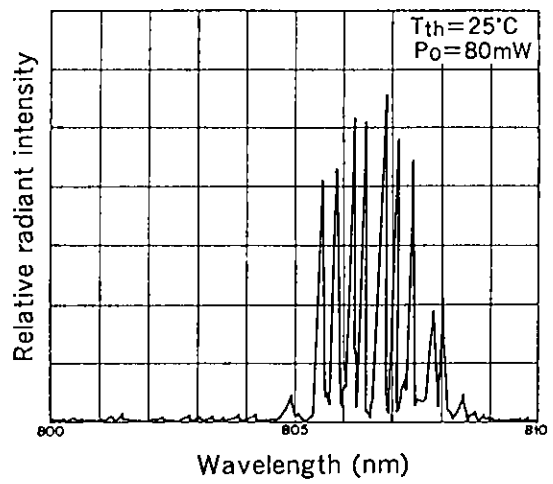
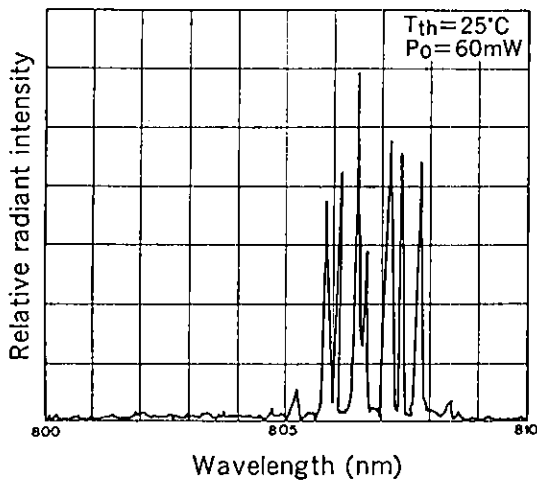
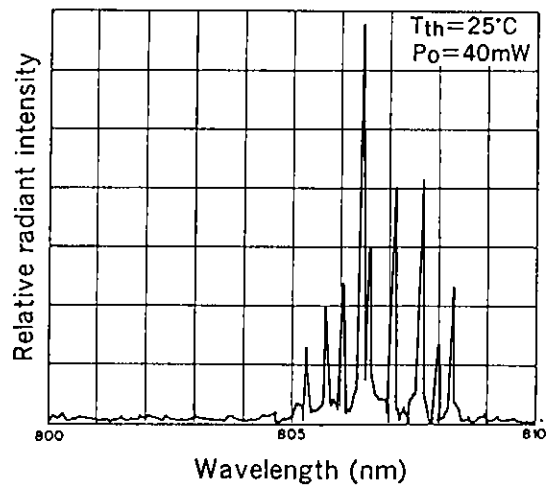
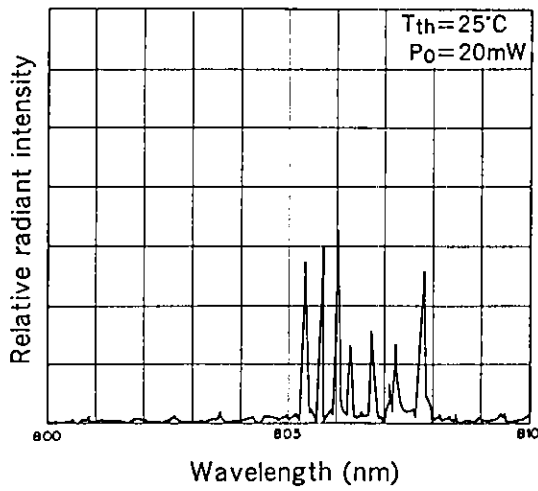
Slope efficiency vs. Temperature characteristics



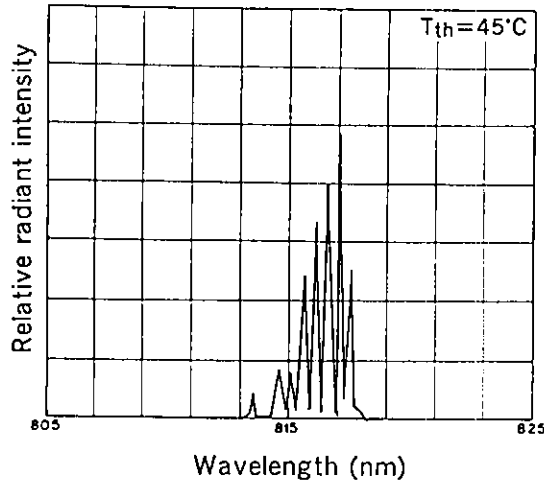
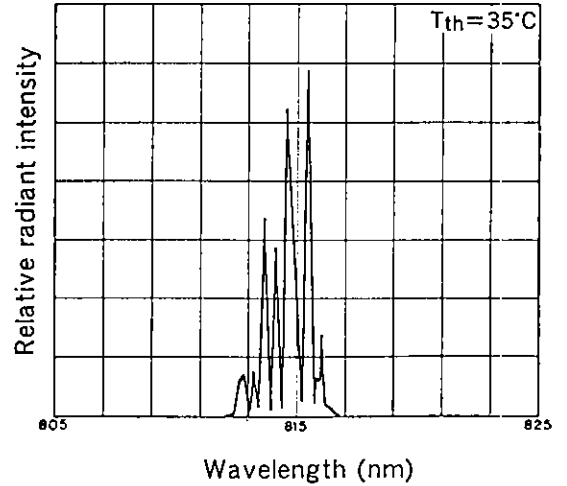
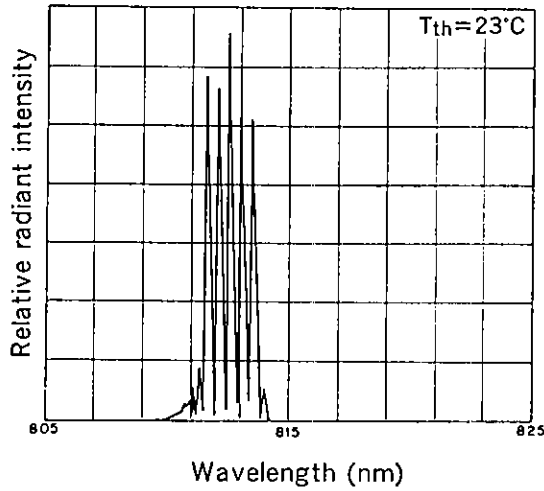
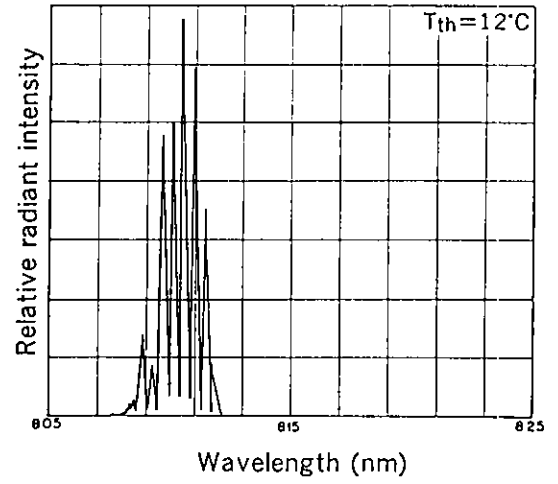
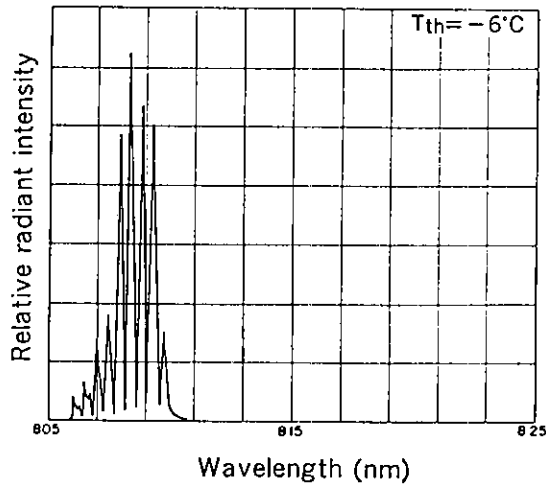
Power dependence of polarization ratio



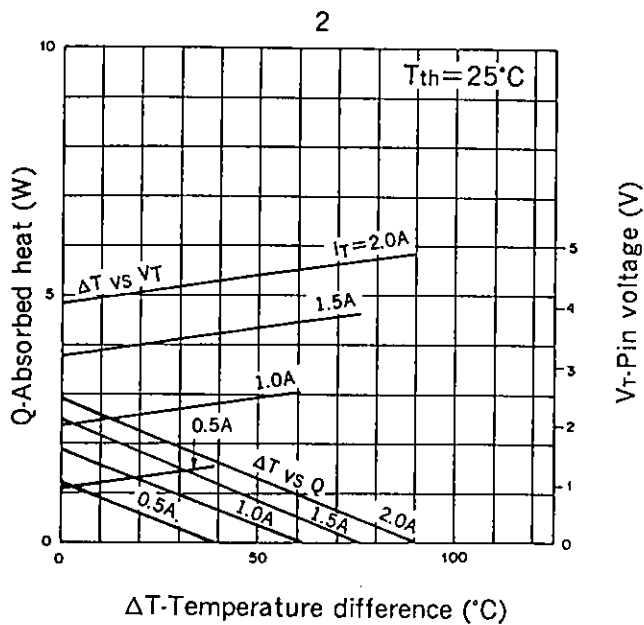
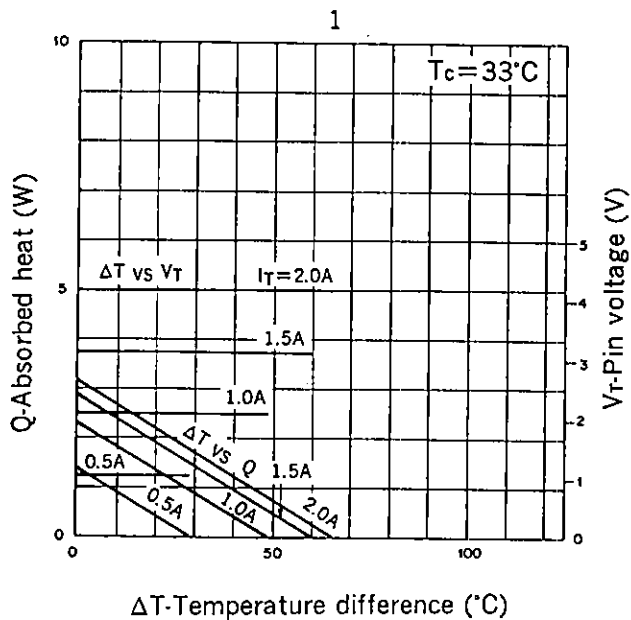
Power dependence of wavelength (spectrum)



Temperature dependence of wavelength ($P_o=90mW$)



TE cooler characteristics



$\Delta T : T_c - T_{th}$
 $T_{th} : \text{Thermistor temperature}$
 $T_c : \text{Case temperature}$

Thermistor characteristics

