

## 200mW High Power Laser Diode

### Description

SLD302WT is a gain-guided, high-power 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  $P_o=180\text{mW}$
- Small operating current
- TO-3 package with built-in TE cooler, thermistor and photodiode

### Structure

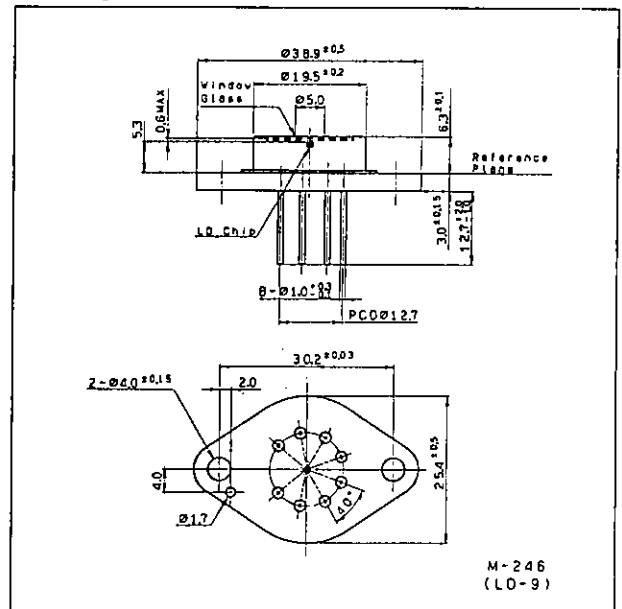
GaAlAs double-hetero laser diode

### Applications

- Solid state laser excitation
- Medical use

### Package Outline

Unit: mm



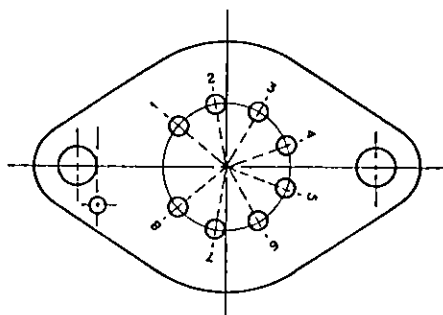
M-246  
(LO-9)

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

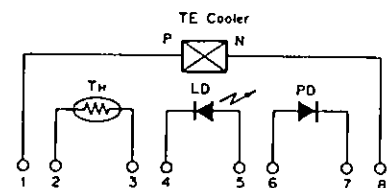
• Radiant power output	$P_o$	200	mW
• Reverse voltage	$V_R$	LD 2 PD 15	V
• Operating temperature	$T_{opr}$	-10 to +50	$^{\circ}\text{C}$
• Storage temperature	$T_{stg}$	-40 to +85	$^{\circ}\text{C}$
• Operating current of TE cooler	$I_T$	2.1	A

### 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<sub>th</sub>=25°C

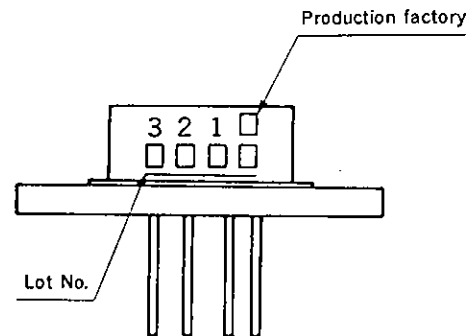
Item	Symbol	Condition	Min.	Typ.	Max.	Unit	
Threshold current	I <sub>th</sub>			150	200	mA	
Operating current	I <sub>OP</sub>	P <sub>O</sub> =180mW		350	500	mA	
Operating voltage	V <sub>OP</sub>	P <sub>O</sub> =180mW		1.9	3.0	V	
Wavelength*	λ <sub>p</sub>	P <sub>O</sub> =180mW	770		840	nm	
Monitor current	I <sub>mon</sub>	P <sub>O</sub> =180mW V <sub>R</sub> =10V		0.3		mA	
Radiation angle (F. W. H. M)	Perpendicular	θ <sub>⊥</sub>	P <sub>O</sub> =180mW		28	40	degree
	Parallel			θ <sub>  </sub>		12	17
Positional accuracy	Position	ΔX, ΔY	P <sub>O</sub> =180mW			±100	μm
	Angle	Δφ <sub>⊥</sub>				±3	degree
Slope efficiency	η <sub>D</sub>	P <sub>O</sub> =180mW	0.65	0.9		mW/mA	
Thermistor resistance	R <sub>th</sub>	T <sub>th</sub> =25°C		10		kΩ	

Note) T<sub>th</sub>: Thermistor temperature

\*Wavelength Selection Classification

Type	Wavelength (nm)
SLD302WT-1	785±15
SLD302WT-2	810±10
SLD302WT-3	830±10
SLD302WT-21	798± 3
-24	807± 3
-25	810± 3

Marking

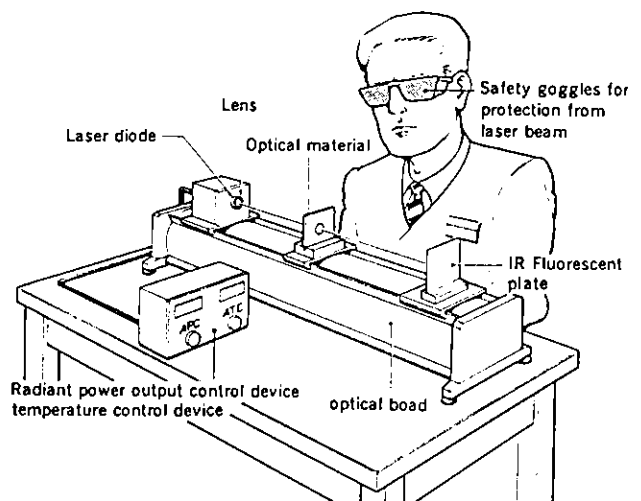


Categories are not specified by marking.

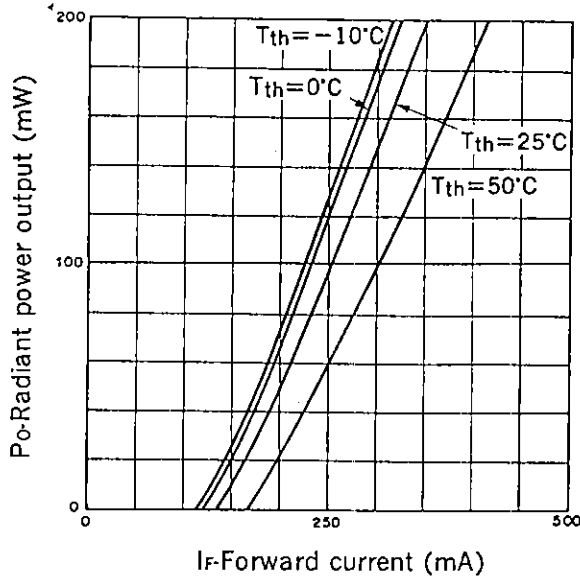
Precautions

Eye protection against laser beams

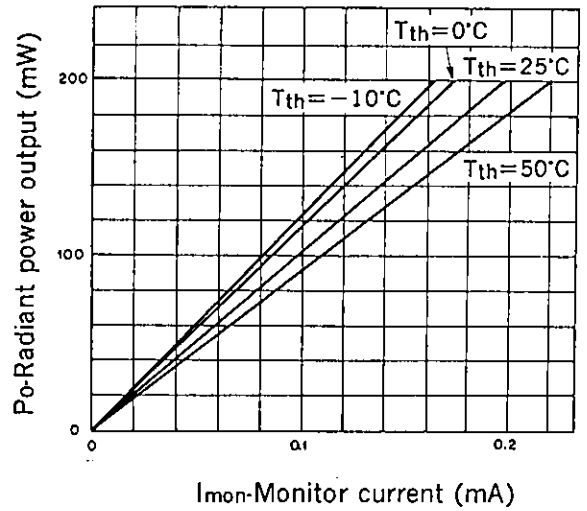
The optical output of laser diodes ranges from several milliwatts to one watt. However the optical density of the laser beam at the diode chip reaches 1 megawatt per square centimeter. Unlike gas lasers, since laser diode beams are divergent, uncollimated laser diode beams are fairly safe at a laser 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.



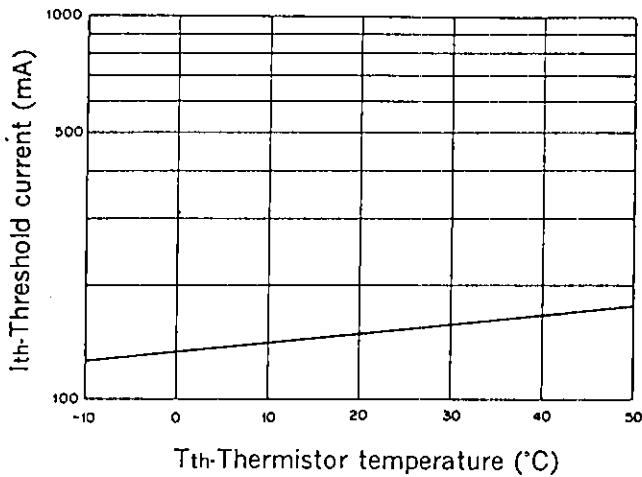
Radiant power output vs. Forward current characteristics



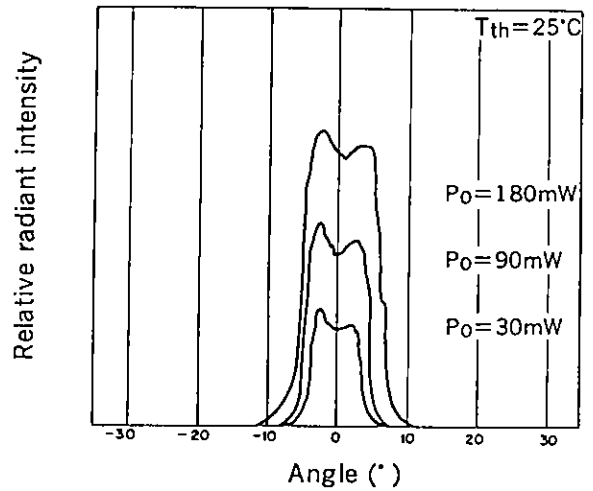
Radiant power output vs. Monitor current characteristics



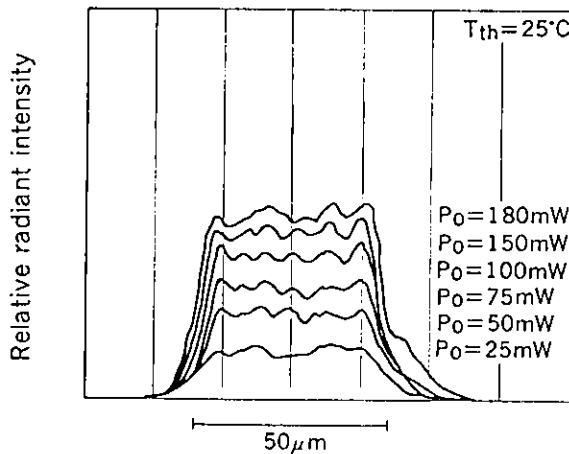
Threshold current vs. Temperature characteristics



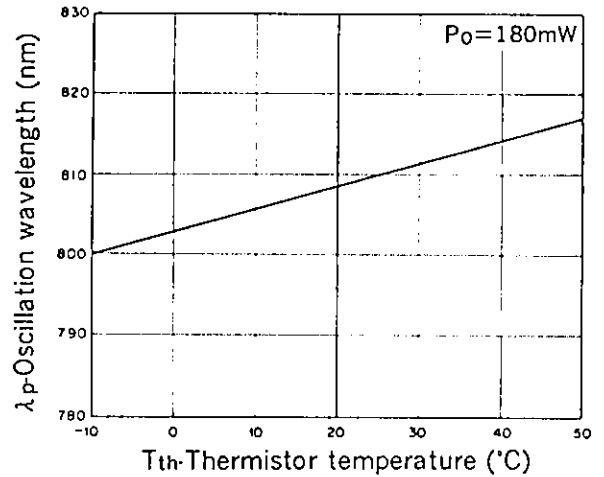
Power dependence of far field pattern (parallel to junction)



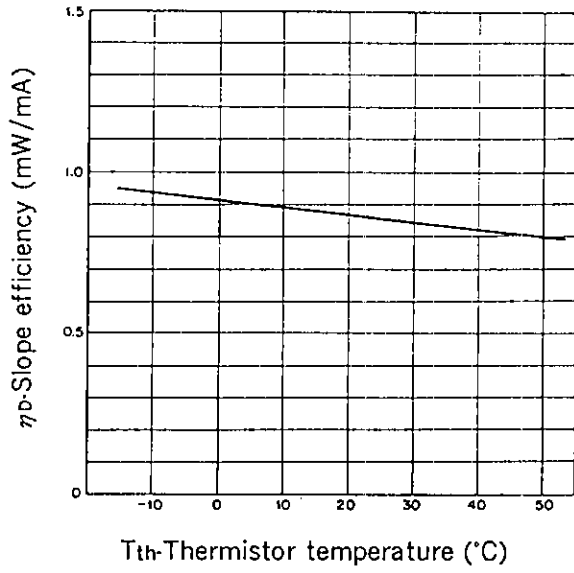
Power dependence of near field pattern



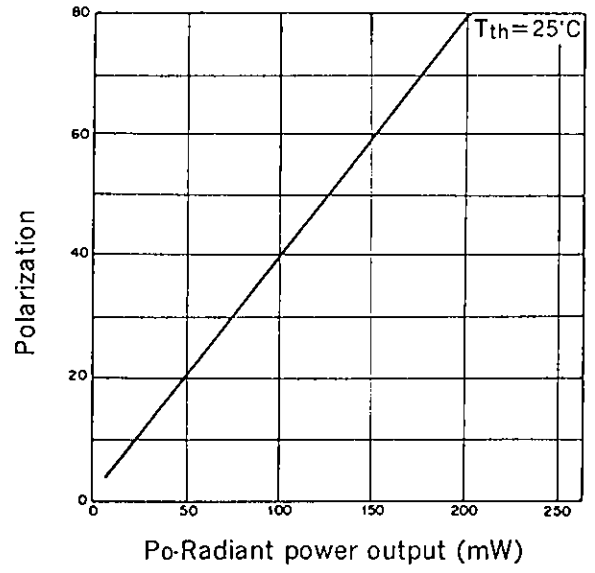
Oscillation wavelength vs. Temperature characteristics



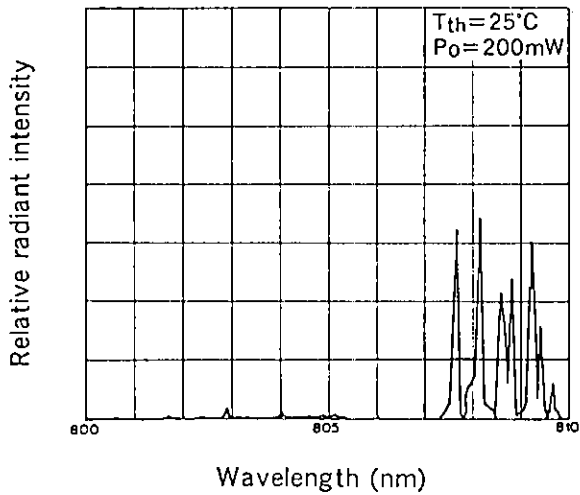
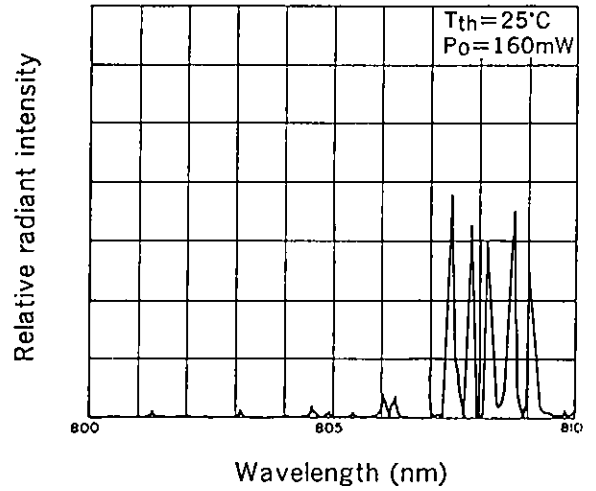
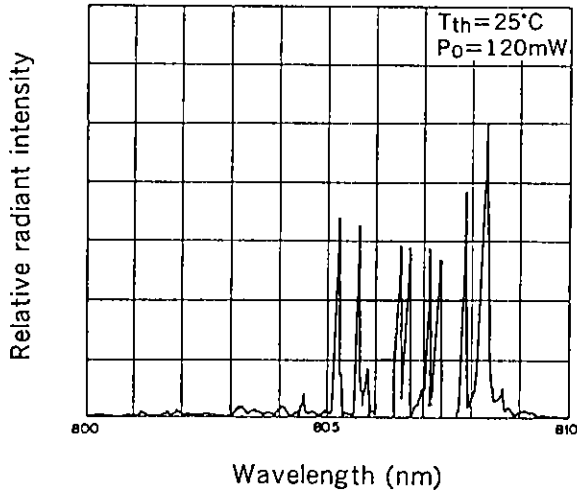
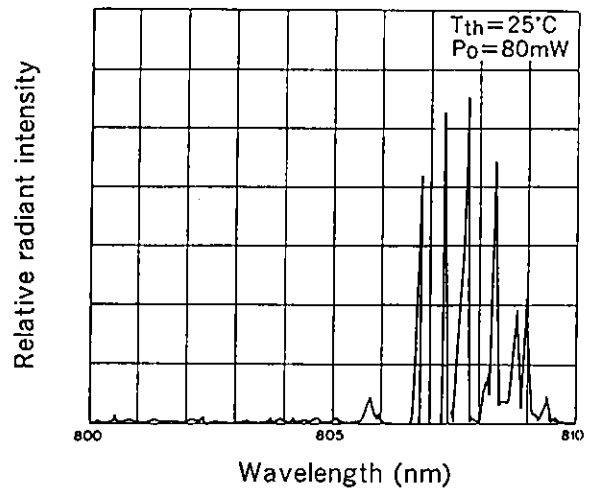
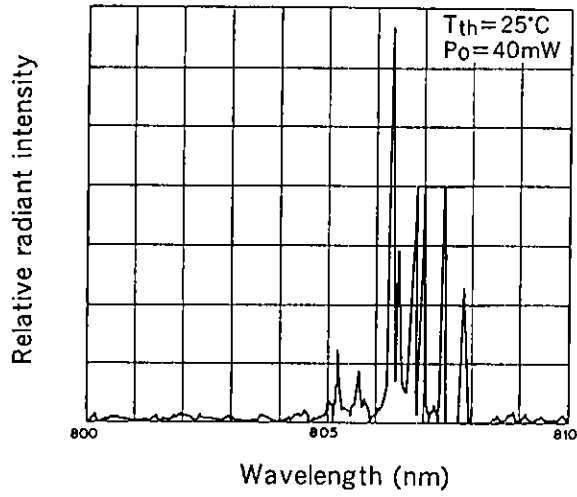
Slope efficiency vs.  
Temperature characteristics



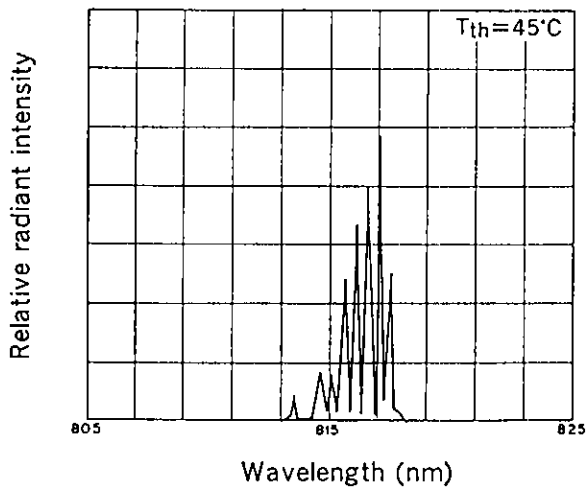
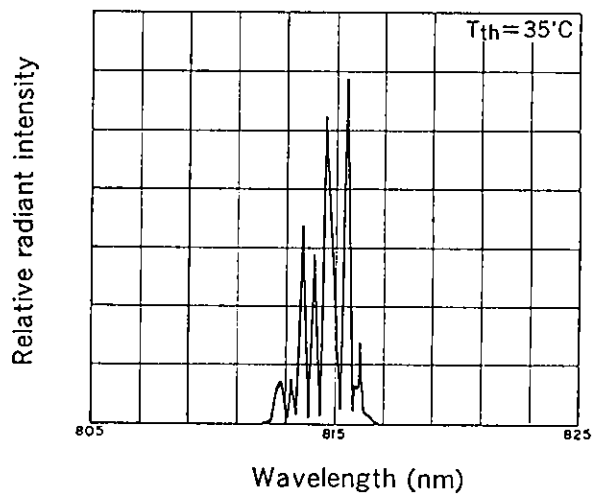
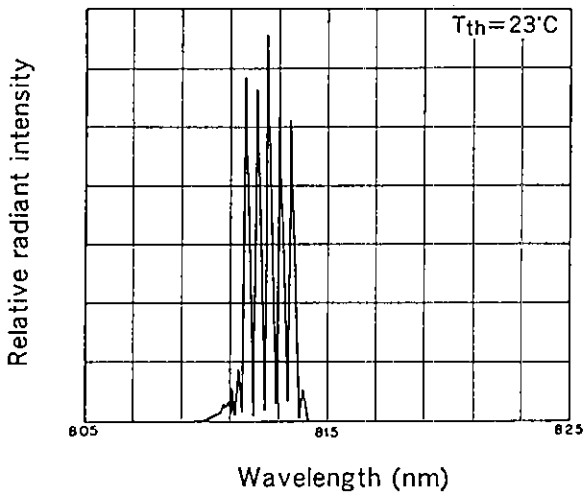
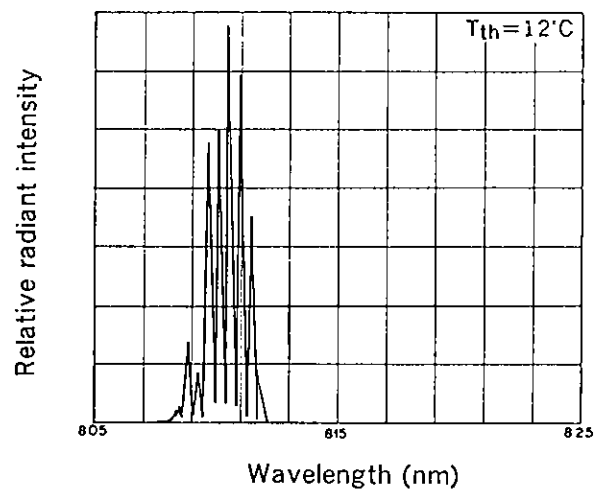
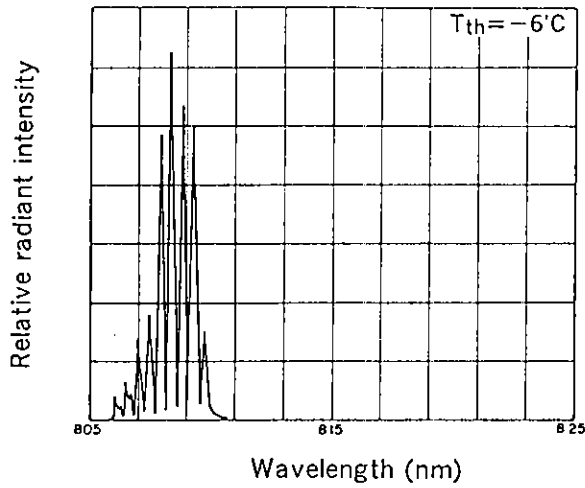
Power dependence of polarization ratio



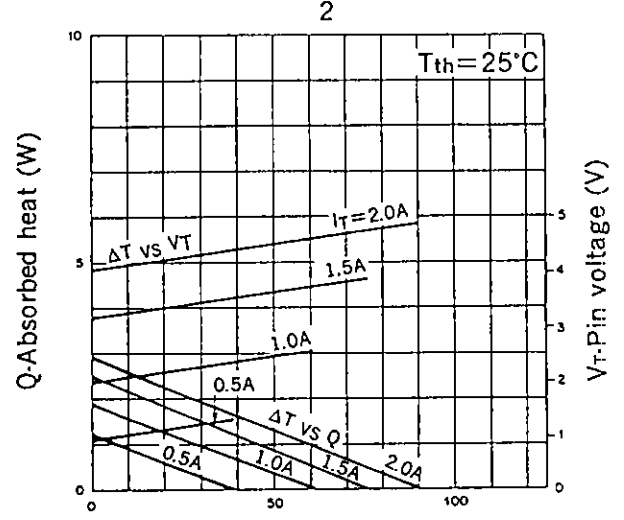
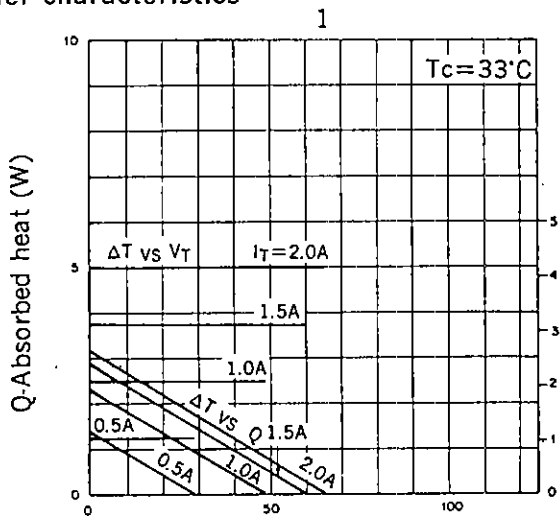
Power dependence of wavelength



Temperature dependence of wavelength ( $P_o=180mW$ )



TE cooler characteristics



$\Delta T$ -Temperature difference ( $^\circ\text{C}$ )

$\Delta T$ -Temperature difference ( $^\circ\text{C}$ )

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

Thermistor characteristics

