

## High Power Density 1W Laser Diode

**Description**

The SLD323XT is a high power, gain-guided laser diode produced by MOCVD method\*1. 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\*2.

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:  $P_o = 1.0W$
- Low operating current:  $I_{op} = 1.4A$  ( $P_o = 1.0W$ )
- Flat package with built-in photo diode, TE cooler, and thermistor

**Applications**

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

**Structure**

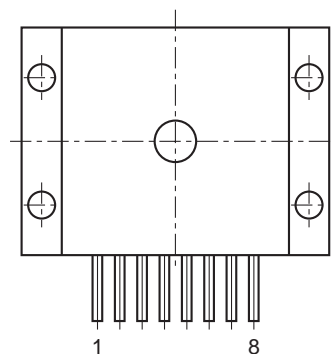
GaAIAs quantum well structure laser diode

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

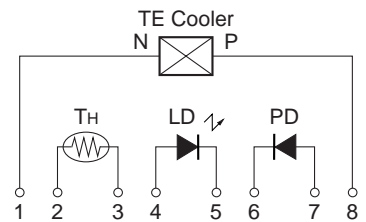
• Optical power output	$P_o$		1.1	W
• Reverse voltage	$V_R$	LD	2	V
		PD	15	V
• Operating temperature ( $T_{th}$ )	$T_{opr}$		-10 to +30	$^{\circ}C$
• Storage temperature	$T_{stg}$		-40 to +85	$^{\circ}C$
• Operating current of TE cooler	$I_T$		2.5	A

**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



**Equivalent Circuit**



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**Electrical and Optical Characteristics**

(Tth: Thermistor temperature, Tth = 25°C)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Threshold current	Ith			0.3	0.5	A	
Operating current	Iop	P <sub>O</sub> = 1.0W		1.4	2.0	A	
Operating voltage	Vop	P <sub>O</sub> = 1.0W		2.1	3.0	V	
Wavelength*1	λp	P <sub>O</sub> = 1.0W	790		840	nm	
Monitor current	I <sub>mon</sub>	P <sub>O</sub> = 1.0W V <sub>R</sub> = 10V	0.3	1.5	6.0	mA	
Radiation angle (F. W. H. M.*)	Perpendicular	θ <sub>⊥</sub>	P <sub>O</sub> = 1.0W	20	30	40	degree
	Parallel	θ <sub>//</sub>		4	9	17	degree
Positional accuracy	Position	ΔX, ΔY	P <sub>O</sub> = 1.0W			±100	μm
	Angle	Δφ <sub>⊥</sub>				±3	degree
Differential efficiency	η <sub>D</sub>	P <sub>O</sub> = 1.0W	0.5	0.9		W/A	
Thermistor resistance	R <sub>th</sub>	T <sub>th</sub> = 25°C		10		kΩ	

\* F. W. H. M. : Full Width at Half Maximum

**\*1 Wavelength Selection Classification**

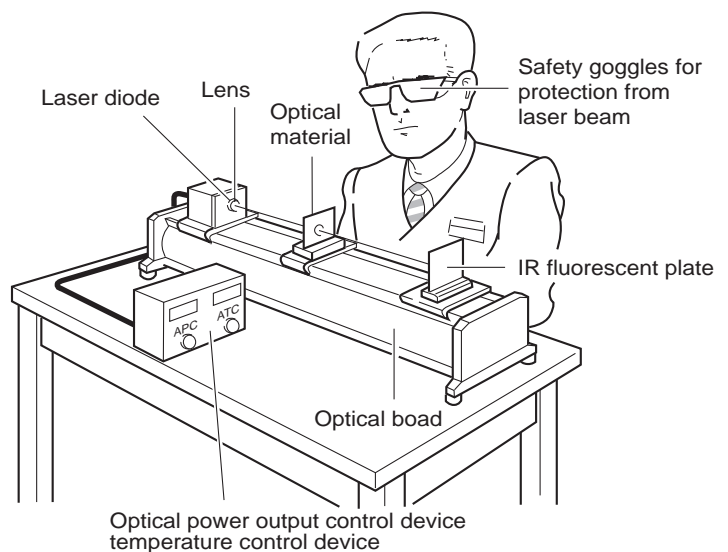
Type	Wavelength (nm)
SLD323XT-1	795 ± 5
SLD323XT-2	810 ± 10
SLD323XT-3	830 ± 10

Type	Wavelength (nm)
SLD323XT-21	798 ± 3
SLD323XT-24	807 ± 3
SLD323XT-25	810 ± 3

**Handling Precautions**

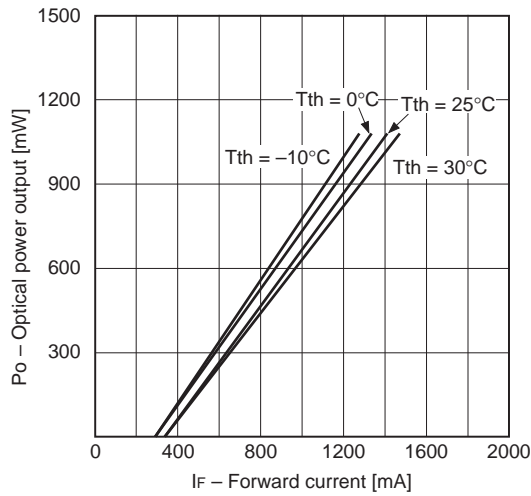
Eye protection against laser beams

The optical output of laser diodes ranges from several mW to 3W. However the optical power density of the laser beam at the diode chip reaches 1MW/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.

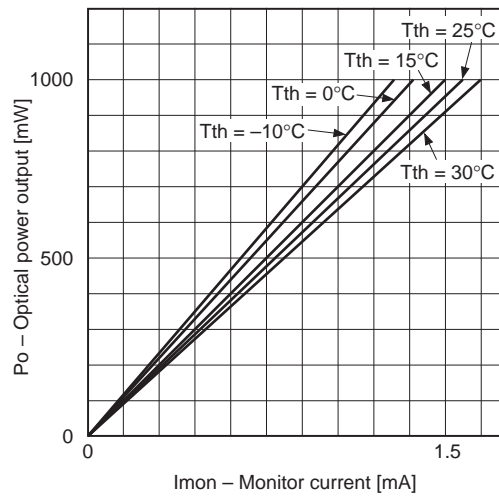


Example of Representative Characteristics

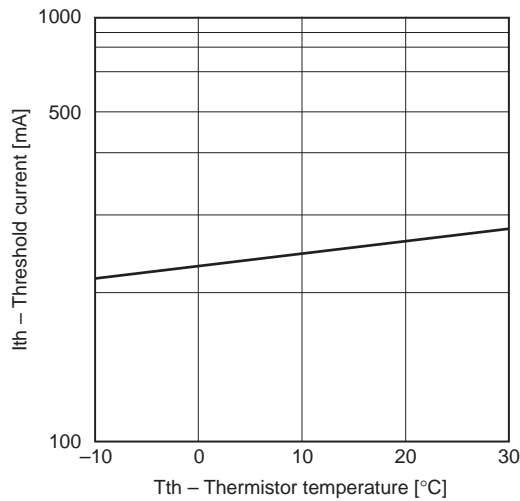
Optical power output vs. Forward current characteristics



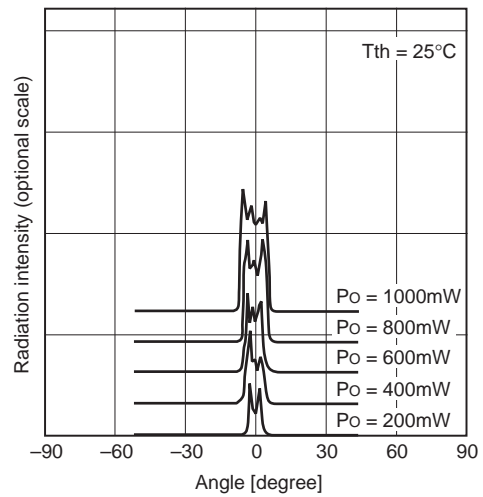
Optical power output vs. Monitor current characteristics



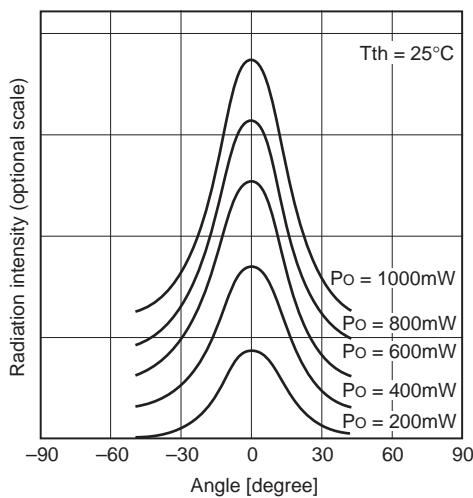
Threshold current vs. Temperature characteristics



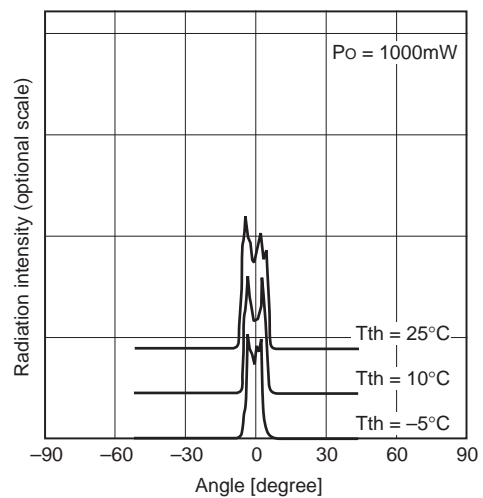
Power dependence of far field pattern (Parallel to junction)



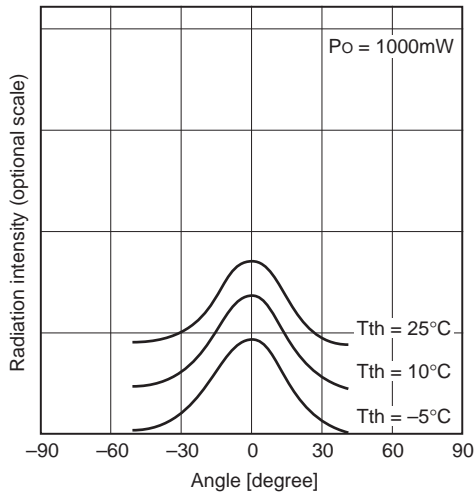
Power dependence of far field pattern (Perpendicular to junction)



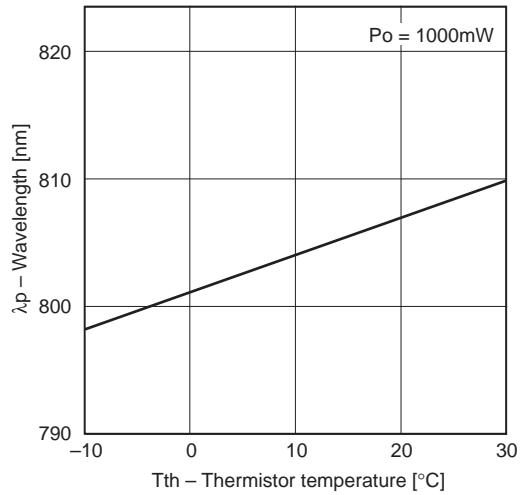
Temperature dependence of far field pattern (Parallel to junction)



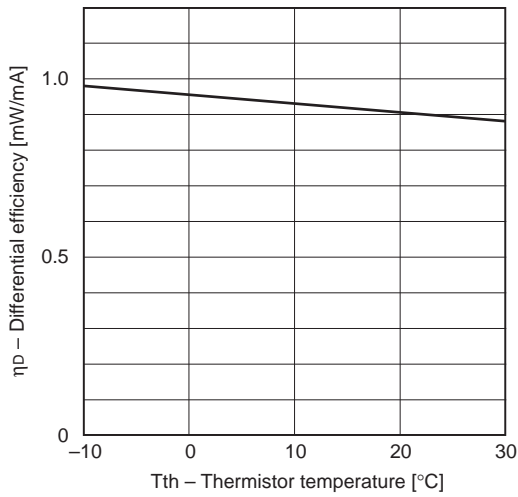
Temperature dependence of far field pattern  
(Perpendicular to junction)



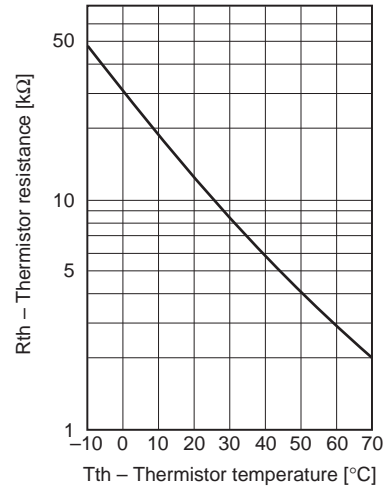
Dependence of wavelength



Differential efficiency vs. Temperature characteristics

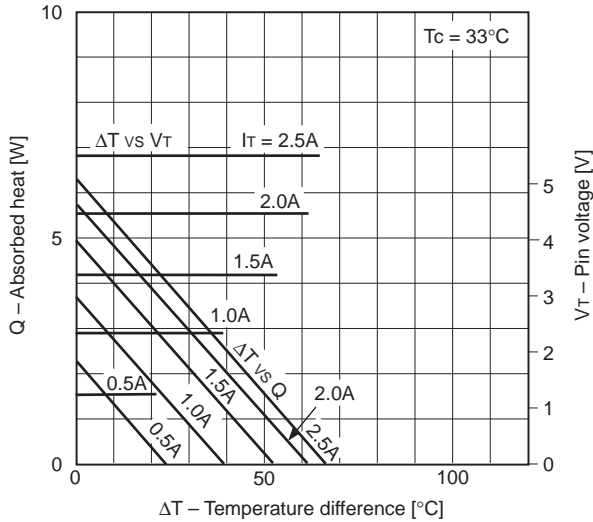


Thermistor characteristics



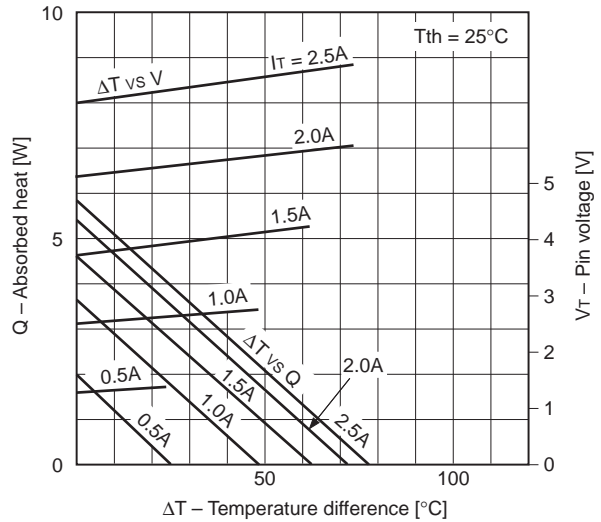
TE cooler characteristics

TE cooler characteristics 1

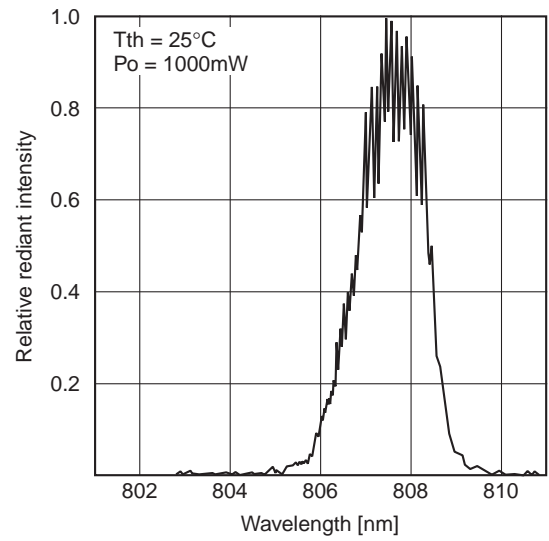
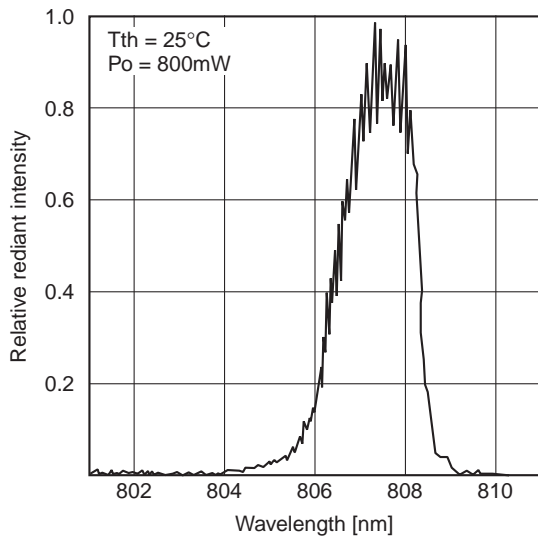
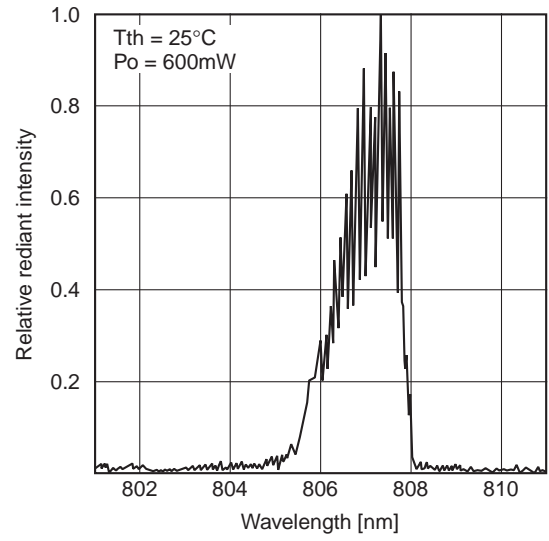
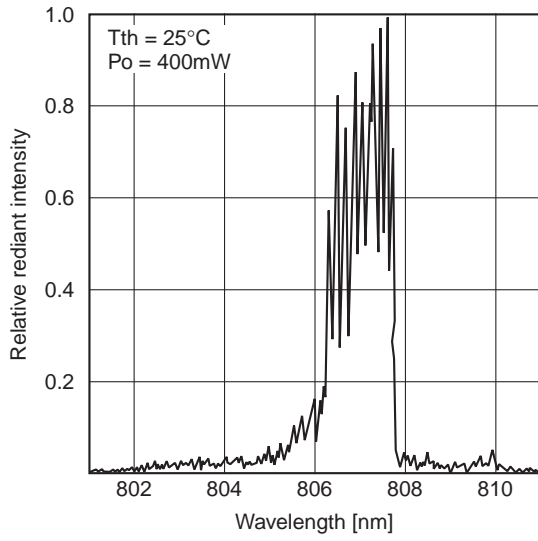


$\Delta T$ : T<sub>c</sub> - T<sub>th</sub>  
T<sub>th</sub>: Thermistor temperature  
T<sub>c</sub>: Case temperature

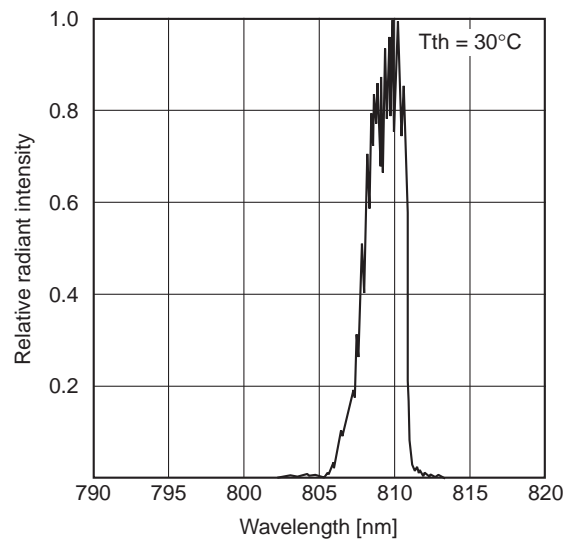
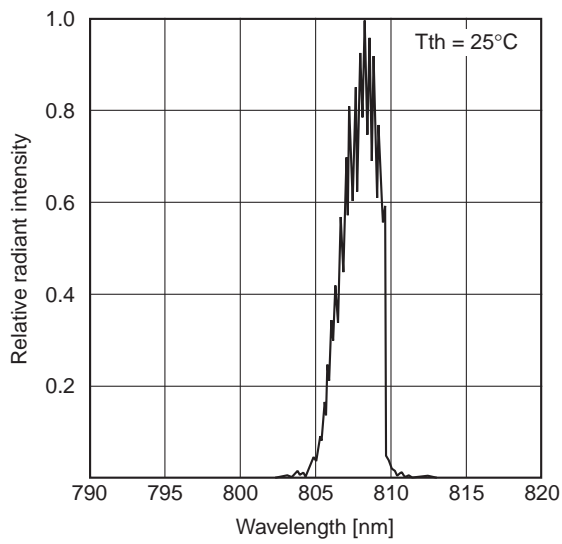
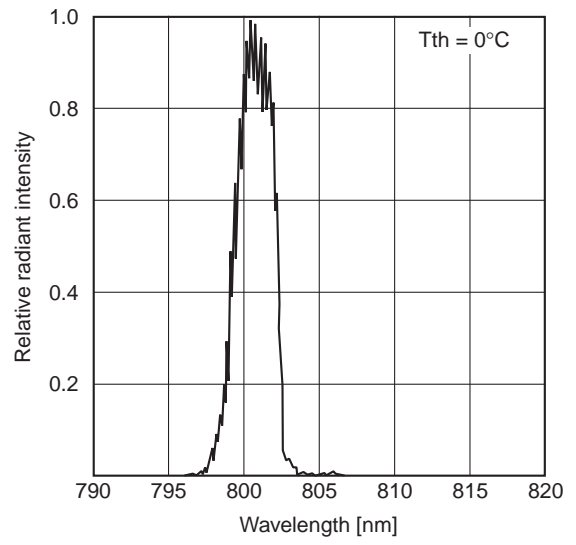
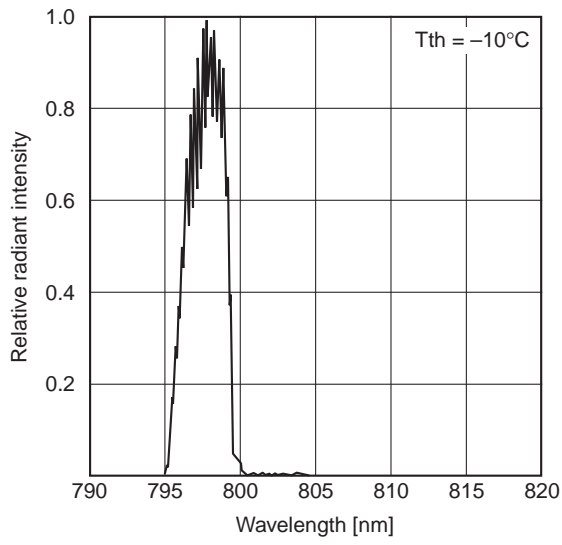
TE cooler characteristics 2



Power dependence of spectrum



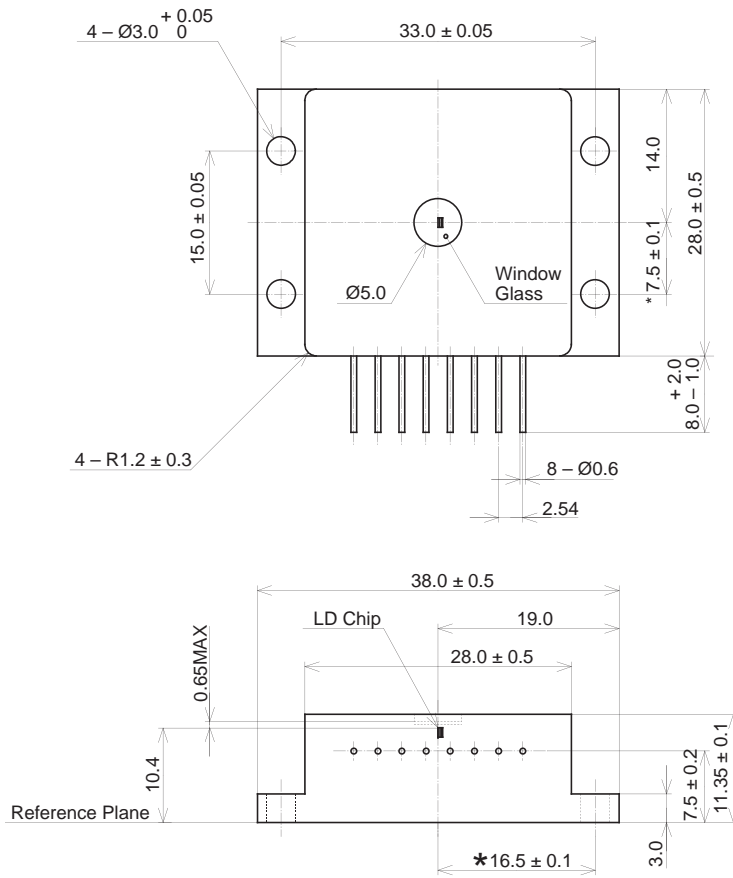
Temperature dependence of spectrum ( $P_o = 1000\text{mW}$ )



Package Outline

Unit: mm

M-273(LO-10)



\*Distance between pilot hole and emitting area

PACKAGE STRUCTURE

SONY CODE	M-273(LO-10)
EIAJ CODE	_____
JEDEC CODE	_____

PACKAGE WEIGHT	43g
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