SONY

SLD322XT

0.5W High Power Laser Diode

Description

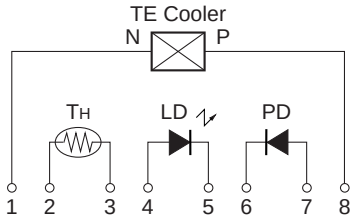
The SLD322XT is a high power, gain-guided laser diode produced by MOCVD method*1. Compared to the SLD300 Series, this laser diode has a high brightness output with a doubled optical density which can be achived by QW-SCH structure*2.

Fine adjustment of the oscillation wavelength is possible by controlling the temperature using the built-in TE cooler (Peltier element).

*1 MOCVD: Metal Organic Chemical Vapor Deposition

*2 QW-SCH: Quantum Well Separate Confinement Heterostructure

Equivalent Circuit

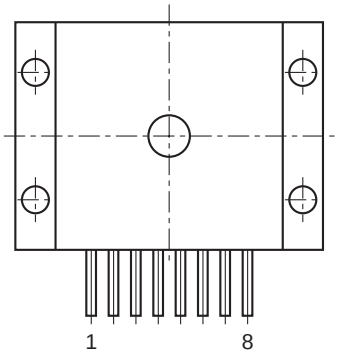


Features

- High power
  Recommended optical power output: Po = 0.5W
- Low operating current: Iop = 0.75A (Po = 0.5W)
- Flat package with built-in photodiode, TE cooler, and thermistor

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)



Applications

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

Structure

AlGaAs quantum well structure laser diode

Operating Lifetime

MTTF 10,000H (effective value) at Po = 0.5W, Tth = 25°C

Absolute Maximum Ratings (Tth = 25°C)

• Optical power output	Po		0.55	W
• Reverse voltage	V_R	LD	2	V
		PD	15	V
• Operating temperature (Tth)	Topr		–10 to +30	°C
• Storage temperature	Tstg		–40 to +85	°C

Warranty

This warranty period shall be 90 days after receipt of the product or 1,000 hours operation time whichever is shorter.

Sony Quality Assurance Department shall analyze any product that fails during said warranty period, and if the analysis results show that the product failed due to material or manufacturing defects on the part of Sony, the product shall be replaced free of charge.

Laser diodes naturally have differing lifetimes which follow a Weibull distribution.

Special warranties are also available.

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E93206B02-PS

Electrical and Optical Characteristics (Tth: Thermistor temperature, Tth = 25°C)

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit
Threshold current		Ith			0.18	0.3	A
Operating current		Iop	P_O = 0.5W		0.75	1.2	A
Operating voltage		Vop	P_O = 0.5W		2.1	3.0	V
Wavelength*		λp	P_O = 0.5W	790		840	nm
Monitor current		Imon	P_O = 0.5W V_R = 10V	0.15	0.8	3.0	mA
Radiation angle	Perpendicular	θ⊥	P_O = 0.5W	20	30	40	degree
	Parallel	θ//		4	9	17	degree
Positional accuracy	Position	ΔX, ΔY	P_O = 0.5W			±100	μm
	Angle	Δϕ⊥				±3	degree
Differential efficiency		η_D	P_O = 0.5W	0.5	0.9		W/A
Thermistor resistance		Rth	Tth = 25°C		10		kΩ

* **Wavelength Selection Classification**

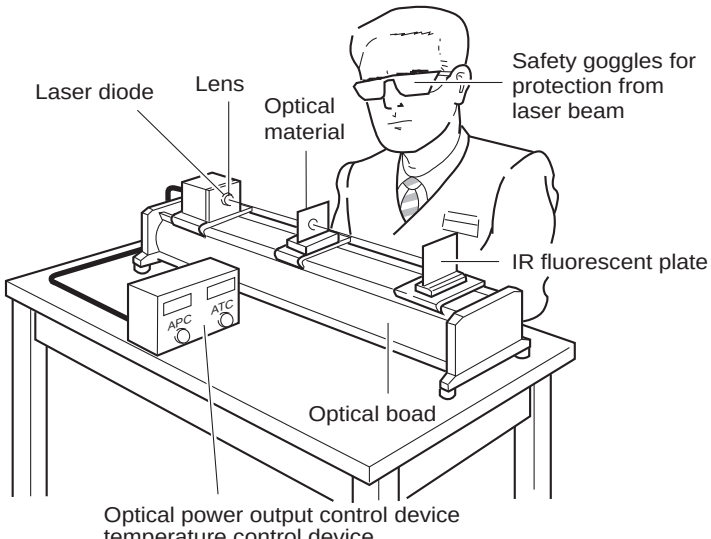
Type	Wavelength (nm)
SLD322XT-1	795 ± 5
SLD322XT-2	810 ± 10
SLD322XT-3	830 ± 10

Type	Wavelength (nm)
SLD322XT-21	798 ± 3
SLD322XT-24	807 ± 3
SLD322XT-25	810 ± 3

Handling Precautions

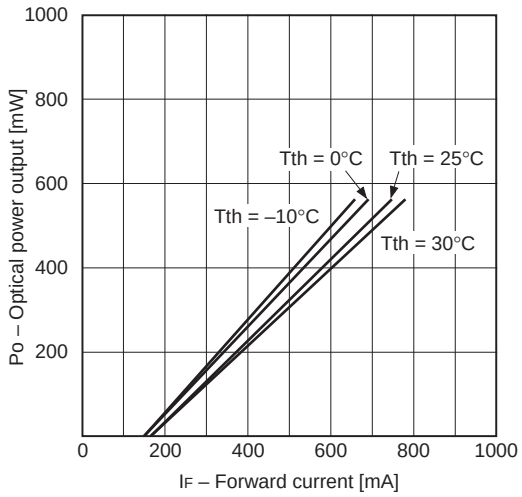
Eye protection against laser beams

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^2. 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.

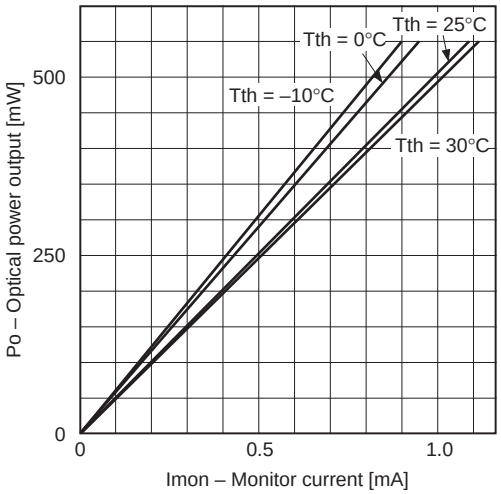


Example of Representative Characteristics

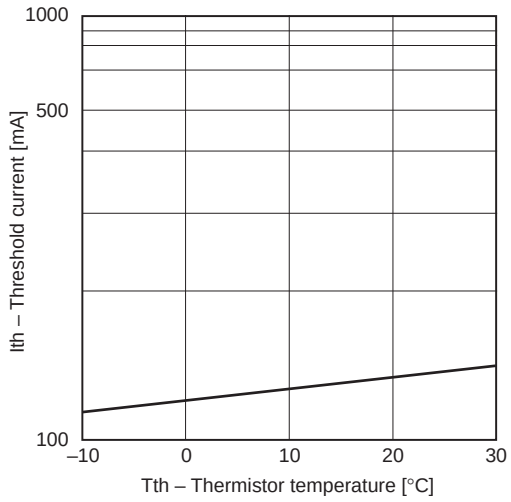
Optical power output vs. Forward current characteristics



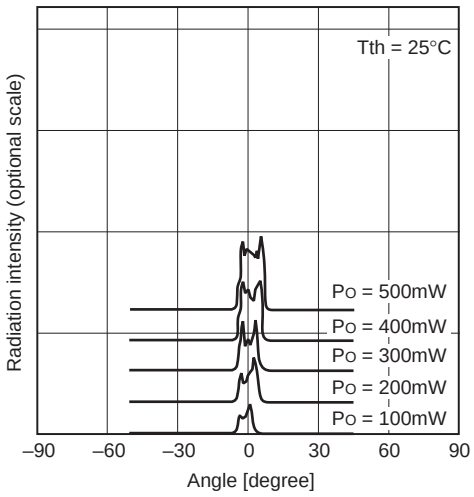
Optical power output vs. Monitor current characteristics



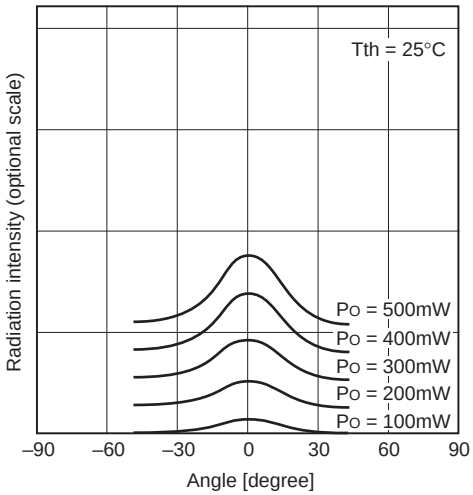
Threshold current vs. Temperature characteristics



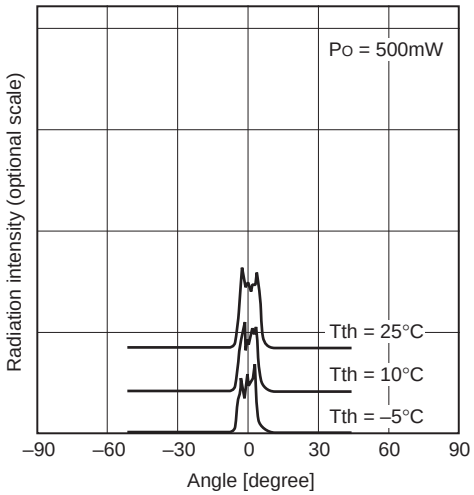
Power dependence of far field pattern (Parallel to junction)



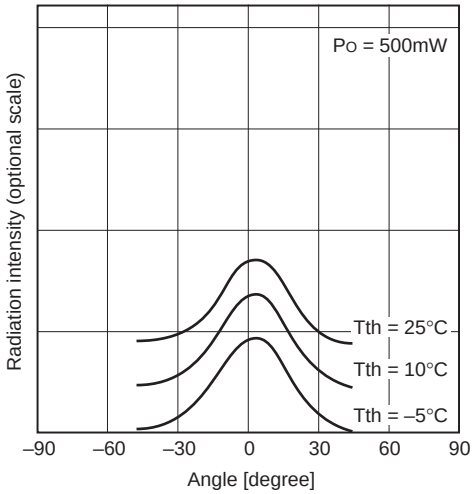
Power dependence of far field pattern (Perpendicular to junction)



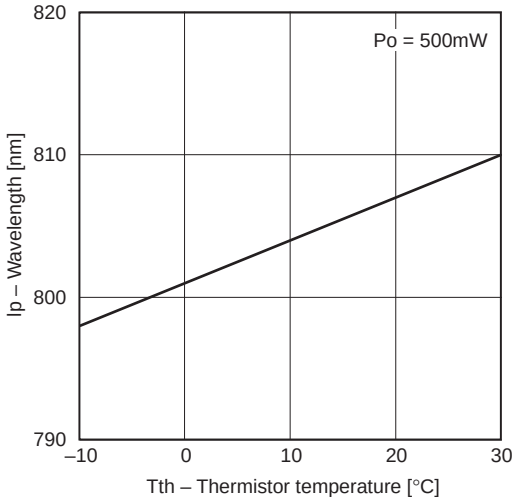
Temperature dependence of far field pattern (Parallel to junction)



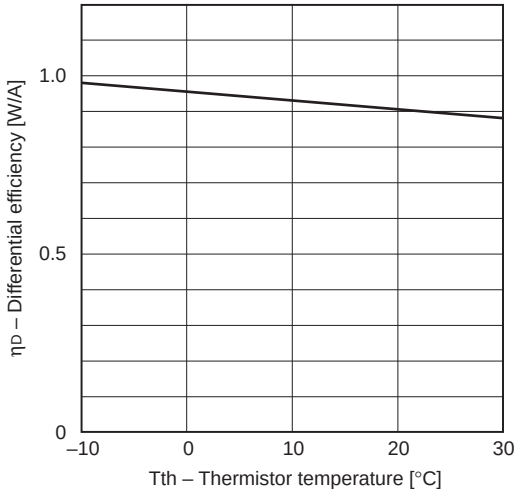
Temperature dependence of far field pattern (Perpendicular to junction)



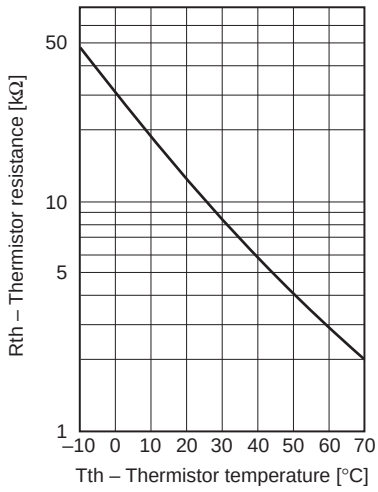
Dependence of wavelength



Differential efficiency vs. Temperature characteristics

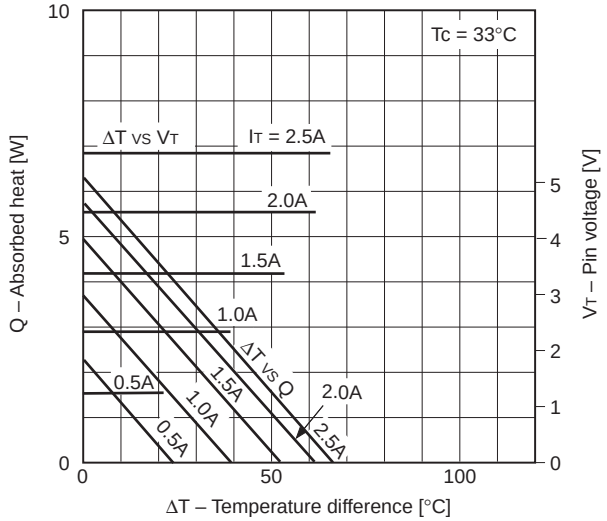


Thermistor characteristics

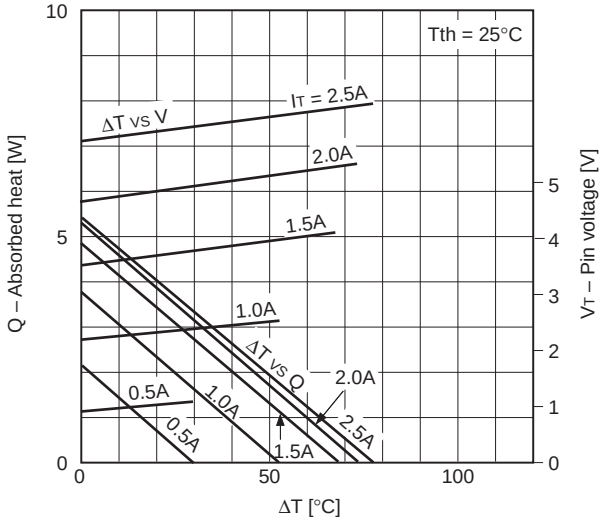


TE cooler characteristics

TE cooler characteristics 1

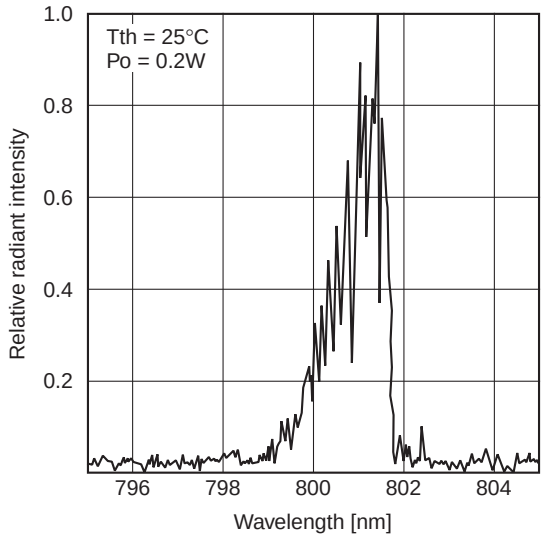


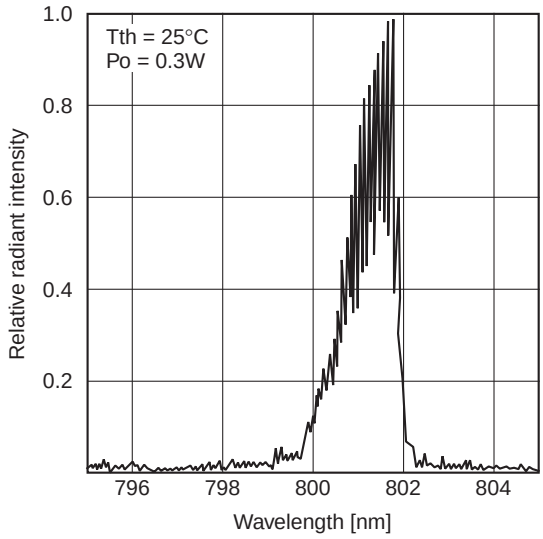
TE cooler characteristics 2

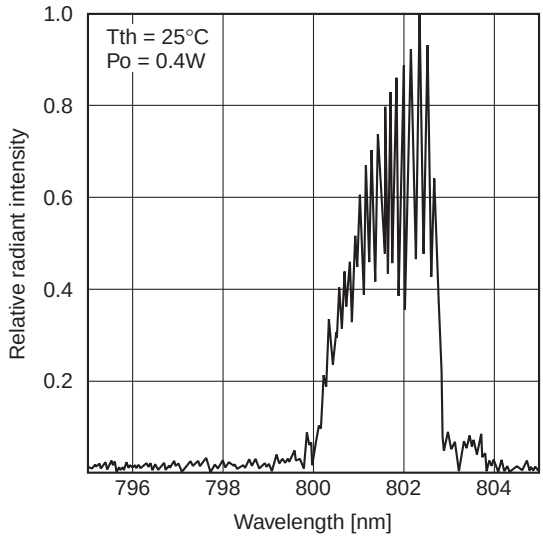


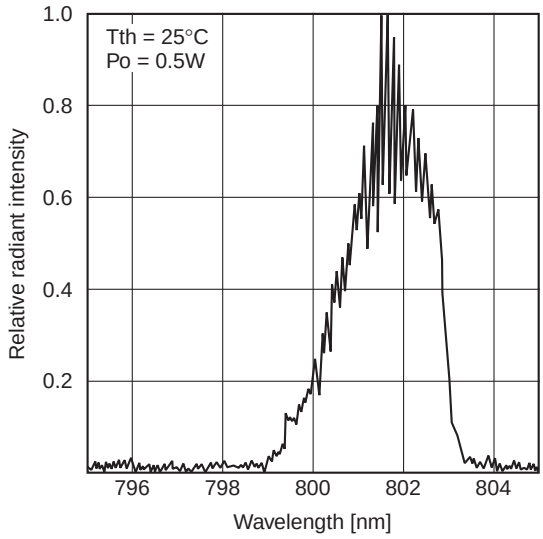
ΔT: Tc – Tth
Tth: Thermistor temperature
Tc: Case temperature

Power dependence of spectrum

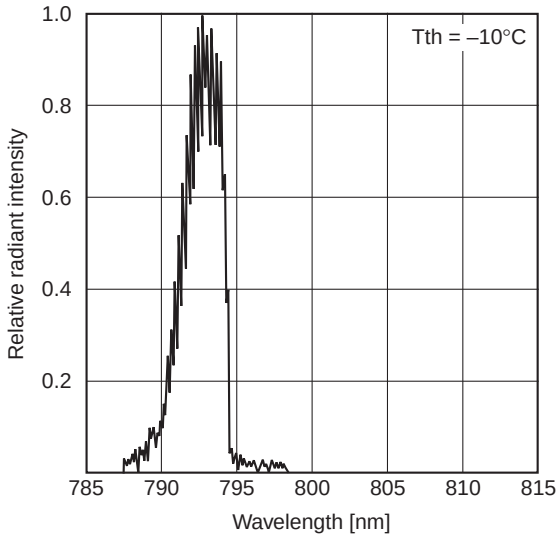


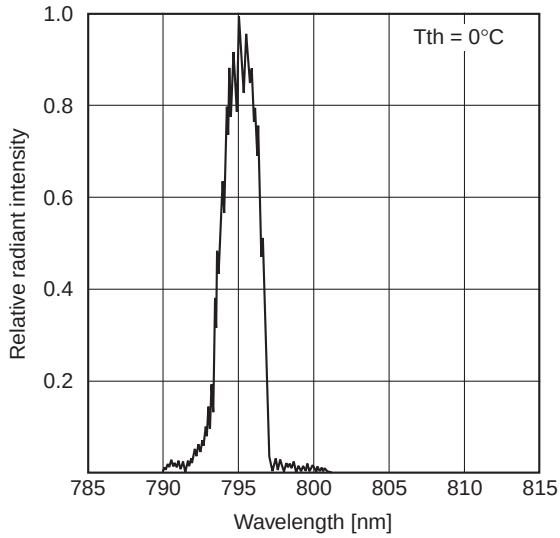


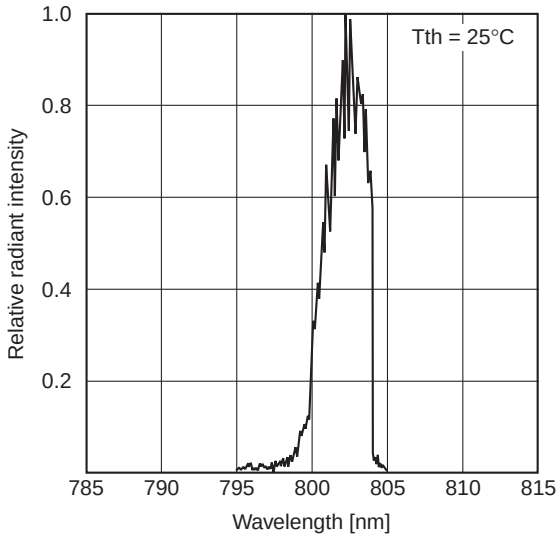


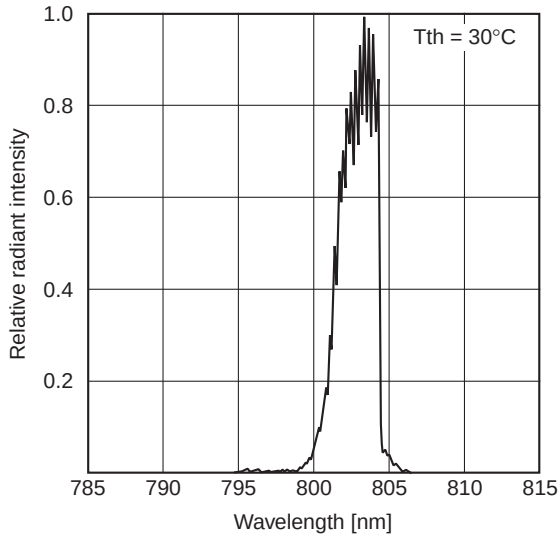


Temperature dependence of spectrum (Po = 0.5W)



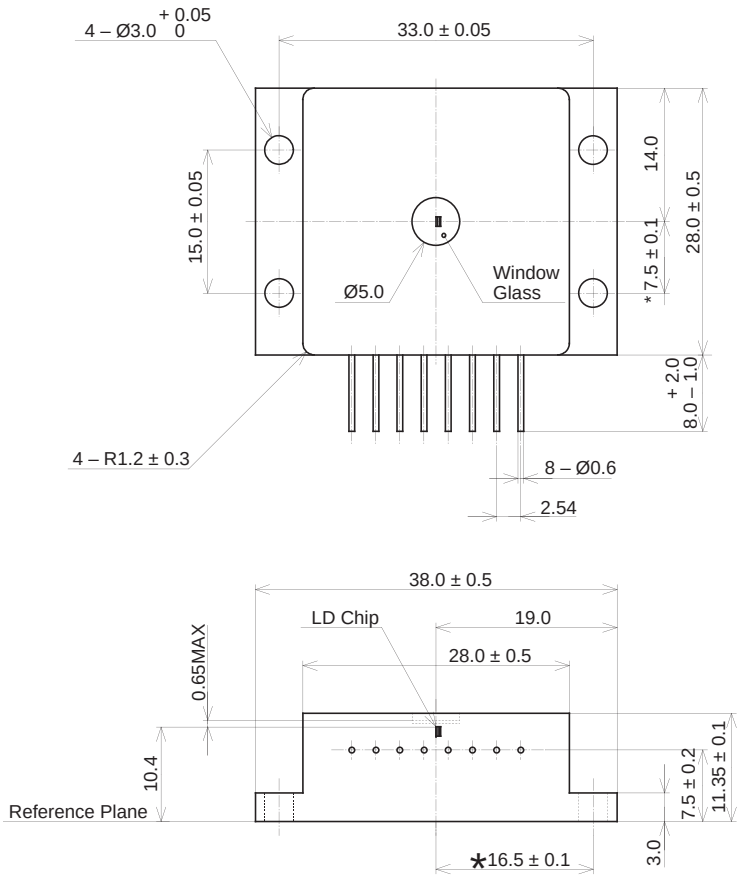






Package Outline Unit: mm

M – 273(LO – 10)



*Distance between pilot hole and emittng area

PACKAGE STRUCTURE

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

PACKAGE WEIGHT	43g