

405nm 300mW 50°C Laser Diode in TO-18 ϕ 5.6mm Package

Part No. LD405E300C05

FEATURES

- Multimode 405nm 300mW Blue Violet Laser Diode
- Package: TO-18 (dia. 5.6mm) without PD
- TE oscillating transverse mode

APPLICATIONS

- OA equipment
- Audio visual equipment
- Home appliance
- Telecommunication equipment (Terminal)
- Measuring equipment
- Tooling machines
- Computers

ABSOLUTE MAXIMUM RATINGS ($T_c = 25^\circ\text{C}$ ⁽¹⁾)

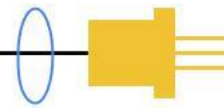
Parameter	Symbol	Condition	Rating	Unit
Optical output power	P_o	CW ⁽²⁾	350	mW
	P_p	Pulse ⁽³⁾		
Reverse voltage (LD)	V_{RL}	-	2	V
Operating temperature (Case temperature)	$T_{op(c)}$	CW ⁽²⁾	0 to +50	$^\circ\text{C}$
	$T_{opp(c)}$	Pulse ⁽³⁾		
Storage temperature	T_{stg}	-	-40 to +85	$^\circ\text{C}$
Soldering temperature ⁽⁴⁾	T_{sld}	-	350	$^\circ\text{C}$

Notes:

1. T_c : Case temperature
2. CW: Continuous Wave operation
3. Pulse: Pulse Operation (Pulse Width 0.2 μ s, Duty: 50%)
4. Soldering temperature means soldering iron tip temperature while soldering. Soldering position is 1.6mm apart from bottom edge of the case (Immersion time: \leq 3s).

ELECTRICAL AND OPTICAL CHARACTERISTICS ⁽¹⁾ ($T_c = 25^\circ\text{C}$ ⁽²⁾)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold current	I_{th}	-	140	200	mA	
Operating current	I_{op}	250	325	400	mA	$P_o = 300\text{mW}$
Operating voltage	V_{op}	-	4.5	5.5	V	$P_o = 300\text{mW}$
Wavelength	λ_p	400	406	414	nm	$P_o = 300\text{mW}$
1/e ² Intensity Angle (Parallel) ⁽³⁾⁽⁵⁾	$\Theta_{//}$	8	14	20	deg	$P_o = 300\text{mW}$
1/e ² Intensity Angle (Perpendicular) ⁽³⁾⁽⁵⁾	Θ_{\perp}	36	41	48	deg	$P_o = 300\text{mW}$
Parallel FFP deviation angle ⁽⁴⁾⁽⁵⁾	$\Delta \Theta_{//}$	-3	-	+3	deg	$P_o = 300\text{mW}$
Perpendicular FFP deviation angle ⁽⁴⁾⁽⁵⁾	$\Delta \Theta_{\perp}$	-4	-	+4	deg	$P_o = 300\text{mW}$
Slope Efficiency	η_d	1.4	1.8	2.2	mW/mA	$\frac{120\text{mW}}{I(300\text{mW}) - I(180\text{mW})}$
Polarization angle ⁽⁶⁾		-5	-	5	deg	$P_o = 50\text{mW}$, NA=0.13
Polarization ratio ⁽⁶⁾	P_I	100	-	-	-	$P_o = 50\text{mW}$, NA=0.13
Pulse operating current ⁽⁷⁾	P_{Iop}	-	-	700	mA	$P_p = 700\text{mW}$
Difference rate of η_p ⁽⁸⁾	$\Delta \eta_p$	-	-	700	mA	$P_p = 50\sim 700\text{mW}$



Notes:

1. Initial value, Continuous Wave operation
2. T_c : Case temperature
3. Full angle of 13.5% ($=1/e^2$) peak intensity
4. Misalignment angle of 13.5% ($=1/e^2$) peak intensity
5. Parallel to the junction plane (X-Z plane); Perpendicular to the junction plane (Y-Z plane)
6. Reference Standards: JIS-C-5943
7. Pulse: Pulse Operation (Pulse Width 0.2us, Duty: 50%)
8. Difference rate of η_p
Pulse Operation (Pulse Width 0.2us, Duty: 50%)

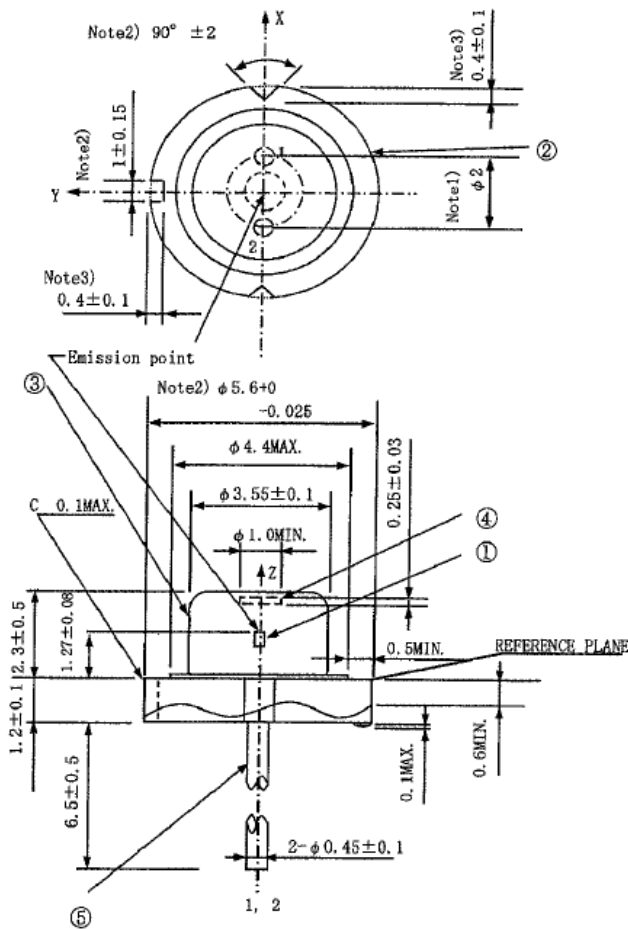
$$\Delta \eta_p = \frac{\eta_{pMax} - \eta_{pMin}}{\eta_p} \times 100 \quad (\%)$$

$$\eta_p = \frac{650mW}{I_{op}(700mW) - I_{op}(50mW)}$$

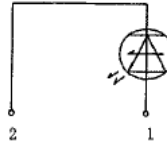
η_{pMax} , η_{pMin} : maximum value and minimum value of the η_p data measured between $P_p=50mW$ to $P_p=700mW$ (I_{op} increment of 5mA).

MECHANICAL OUTLINE (unit: mm)

General Tolerances $\pm 0.2mm$



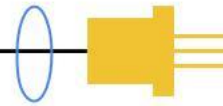
Pin Configuration



No.	Component	Material	Finish
1	Laser Diode Chip	InAlGaN	-
2	Stem	Fe, Cu	Gold-plated
3	Cap	Kovar	Nickel-plated
4	Window glass	Borosilicated glass	-
5	Lead pins	Kovar	Gold-plated

Notes:

1. Dimension of the bottom of leads.
2. These dimensions are valid only in the range of 0 ~ 0.6mm below from the reference plane.
3. These dimensions are defined from the imaginary circle, which goes through the three points around the stem to the bottom of cut off parts.



ADDITIONAL NOTES

- Do not operate the device above maximum ratings. Doing so may cause unexpected and permanent damage to the device.
- Take precautions to avoid electrostatic discharge and/or momentary power spikes. A change in the characteristics of the laser or premature failure may result.
- Proper heat sinking of the device assures stability and lifetime. Always ensure that maximum operating temperatures are not exceeded.
- Observing visible or invisible laser beams with human eye directly, or indirectly, can cause permanent damage. Use a camera to observe the laser.
- No laser device should be used in any application or situation where life or property is at risk in the event of device failure.
- Specifications are subject to change without notice. Ensure that you have the latest specification by contacting us prior to purchase or use of the product.