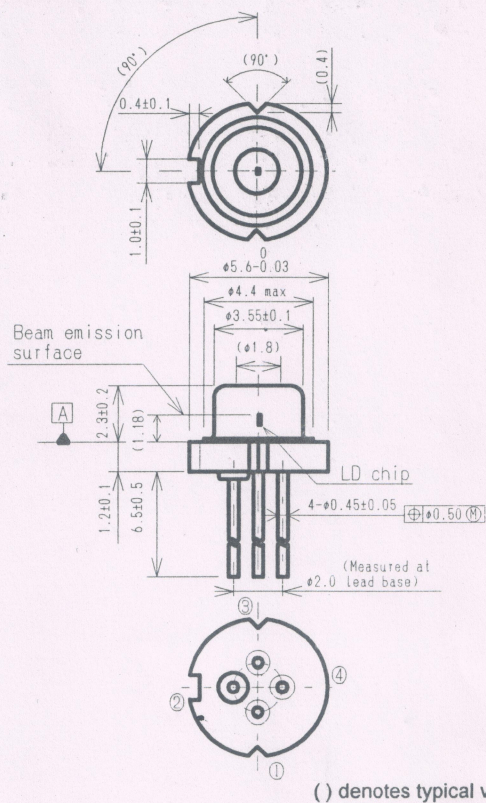


TOLD2000MDA

Unit: mm

- Optical output power:
Absolute maximum rating : $P_o=7\text{mW}$
Operating range : $P_o=5\text{mW}$
- Operation temperature: $T_c=-10$ to 70°C
- Beam distance: $110\ \mu\text{m}$
(optical center: 780-nm lasing point)
- $\phi 5.6\text{mm}$ glassless metal-can package

- | | |
|------------------|---------|
| ① LD (650nm) | Anode |
| ② LD (650/780nm) | Cathode |
| PD | Cathode |
| ③ LD (780nm) | Anode |
| ④ PD | Anode |



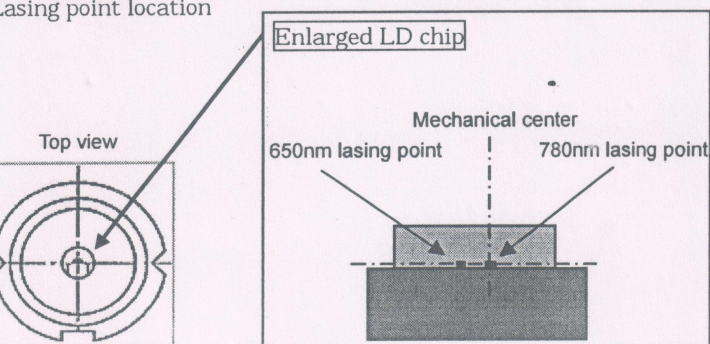
JEDEC	—
JEITA	—
TOSHIBA	15-4A7

Absolute Maximum Ratings (Tc = 25°C)

Characteristics	Symbol	Rating	Unit
Optical output power (650nm)	P _{O1}	7	mW
Optical output power (780nm)	P _{O2}	7	mW
LD reverse voltage (650nm)	V _{R(LD)1}	2	V
LD reverse voltage (780nm)	V _{R(LD)2}	2	V
PD reverse voltage	V _{R(PD)}	30	V
Operation temperature range	T _c	−10 to 70	°C
Storage temperature range	T _{stg}	−40 to 85	°C

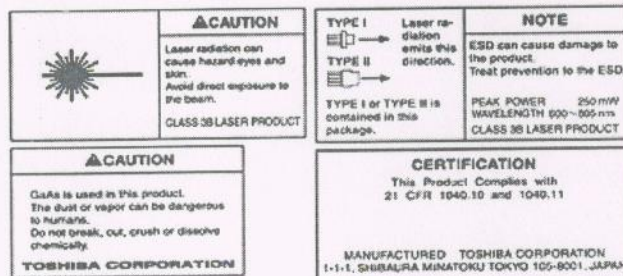
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
650nm	Threshold current	I_{th1}	CW operation	—	25	45	mA
	Operation current	I_{op1}	$P_0=5mW$	—	35	55	mA
	Operation voltage	V_{op1}	$P_0=5mW$	—	2.2	2.5	V
	Lasing wavelength	λ_{p1}	$P_0=5mW$	640	650	663	nm
	Beam divergence	$\theta_{\parallel 1}$	$P_0=5mW$	7	9	13	°
		$\theta_{\perp 1}$	$P_0=5mW$	24	28	32	°
	Monitor current	I_{m1}	$P_0=5mW$	0.06	0.12	0.30	mA
780nm	Threshold current	I_{th2}	CW operation	—	20	40	mA
	Operation current	I_{op2}	$P_0=5mW$	—	35	55	mA
	Operation voltage	V_{op2}	$P_0=5mW$	—	2.2	2.5	V
	Lasing wavelength	λ_{p2}	$P_0 \pm 5mW$	775	790	805	nm
	Beam divergence	$\theta_{\parallel 2}$	$P_0=5mW$	7	10	15	°
		$\theta_{\perp 2}$	$P_0=5mW$	25	32	39	°
	Monitor current	I_{m2}	$P_0=5mW$	0.12	0.35	0.60	mA
PD dark current		$I_{D(PD)}$	$V_{R(PD)}=5V$	—	—	100	nA
PD total capacitance		$C_{T(PD)}$	$V_{R(PD)}=5V, f=1MHz$	—	—	20	pF
Lasing point distance ¹⁾		$\Delta X_{(1-2)}$	Numerical value specified in mask design	107	110	113	μm

Lasing point location



PRECAUTIONS

- 1 Be careful never to exceed, even momentarily, the absolute maximum ratings. The laser diode is damaged by spike current which can be generated when switching the power ON and OFF. Before activating laser diodes, check the transient state of the power supply to ensure that it will not cause the laser diode to exceed the absolute maximum ratings.
For normal operation, set the optical output power to below the operating ranges.
- 2 Effective heat sinking should be performed, because temperature rise caused decrease of optical output power. Use a thermal radiator to reduce the temperature rise.
- 3 Prevent electrostatic discharge and electric spike which may be damage the laser diode. The following precautions should be taken when using a laser diode.
 1. Set the electrical potential of the workbench to be same as that of the power supply ground line.
 2. Soldering irons and the operator's body should be grounded.
 3. Do not operate equipment which may generate high frequency surge energy near the laser diode.
- 4 If the leads are formed, soldering should be performed after lead forming.
Soldering temperature/time : 260°C Max. / 5s Max. or 350°C Max. / 3s Max
(Soldering portion of leads: up to 2mm from the body of the device/Soldering iron : 20W MAX)
- 5 Do not operate the device under dew condensation, because it is not hermetically sealed. Otherwise, it is likely that not only its optical characteristics may be lowered but also its device may be damaged because of short-circuits in the package.
- 6 Do not touch LD chip facet, bonding wire and sub-mount in the device. Keep the LD chip facet from dust.
- 7 Keep any gas released from product-fastening adhesive and silicone grease from getting and staying in the product.
- 8 If it is anticipated that the product will be used in a high-temperature, high-humidity environment for a long time, do not apply a bias voltage to the internal monitor PD.
- 9 Do not look at the laser beam directly or through lenses when the laser diode is activated. The laser beam emitted by laser diode is harmful if aimed directly into human eye.
The following warning labels are attached on to the package. These labels show that TOSHIBA laser diodes are certified to be in compliance with U.S. safety standards for laser products (21 CFR 1040.10 and 1044.11).



- 10 Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them.
- 11 Do not attempt to use this product to emit both 650-nm and 780-nm lasers simultaneously.

RESTRICTIONS ON PRODUCT USE

- The information contained herein is subject to change without notice.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others.
- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- TOSHIBA products should not be embedded to the downstream products which are prohibited to be produced and sold, under any law and regulations.
- GaAs(Gallium Arsenide) is used in this product. The dust or vapor is harmful to the human body. Do not break, cut, crush or dissolve chemically.