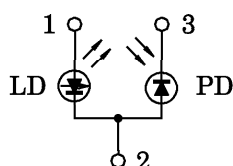


TOSHIBA LASER DAIODE InGaAlP

**TOLD9441MC**

Unit in mm

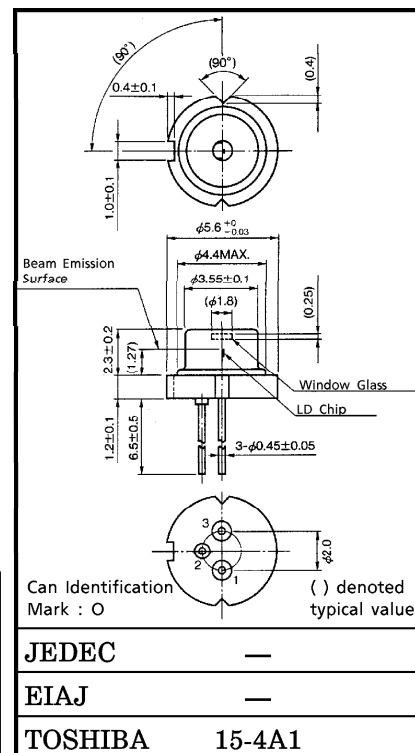
- Lasing Wavelength :  $\lambda_p = 650\text{nm}$  (Typ.)
- Optical Output Power :  $P_o = 5\text{mW}$
- Operation Case Temperature :  $T_c = -10 \sim 70^\circ\text{C}$
- Pin Connection



1. LASER DIODE ANODE
2. LASER DIODE CATHODE
3. PHOTODIODE CATHODE

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

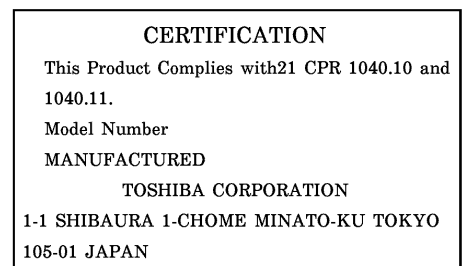
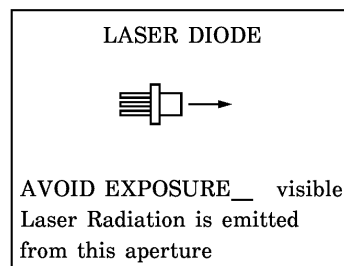
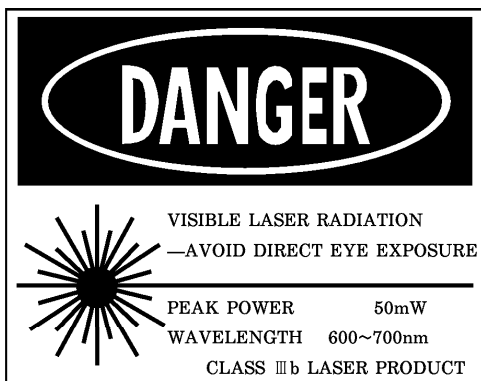
CHARACTERISTIC	SYMBOL	RATING	UNIT
Optical Output Power (CW)	$P_o$	7	mW
LD Reverse Voltage	$V_R(\text{LD})$	2	V
PD Reverse Voltage	$V_R(\text{PD})$	30	V
Operation Case Temperature	$T_c$	$-10 \sim 70$	$^\circ\text{C}$
Storage Temperature	$T_{\text{stg}}$	$-40 \sim 85$	$^\circ\text{C}$

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

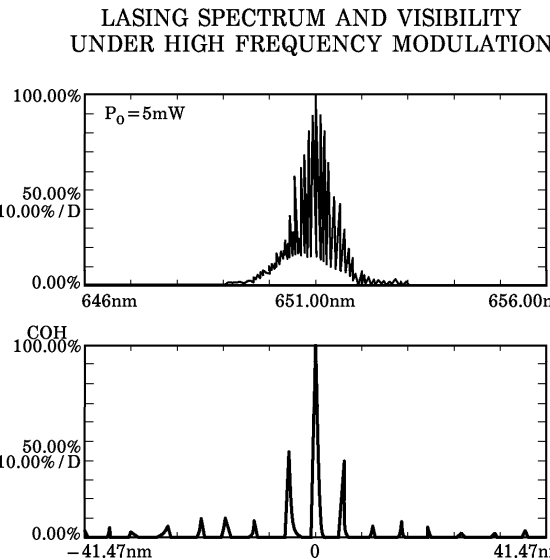
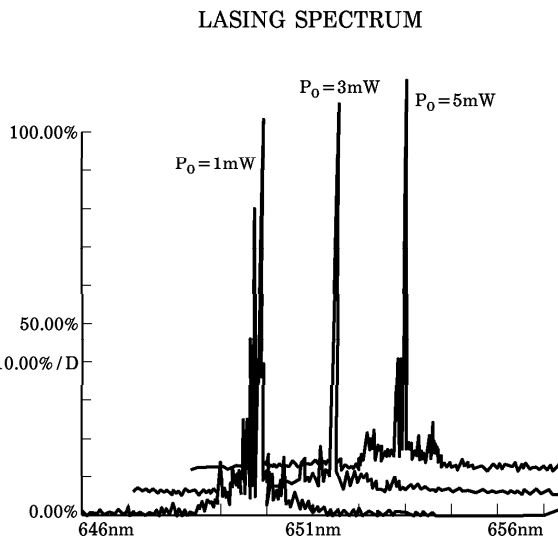
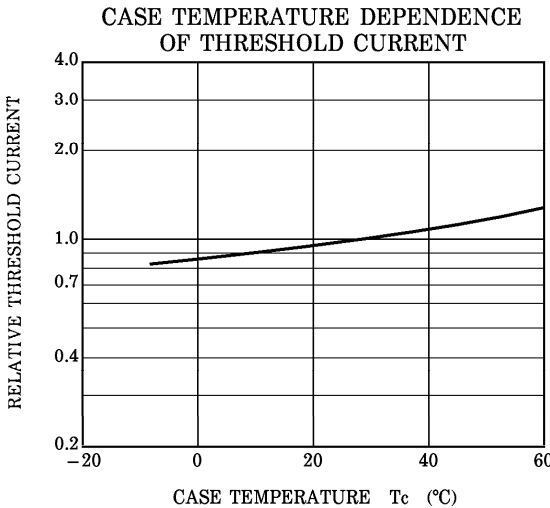
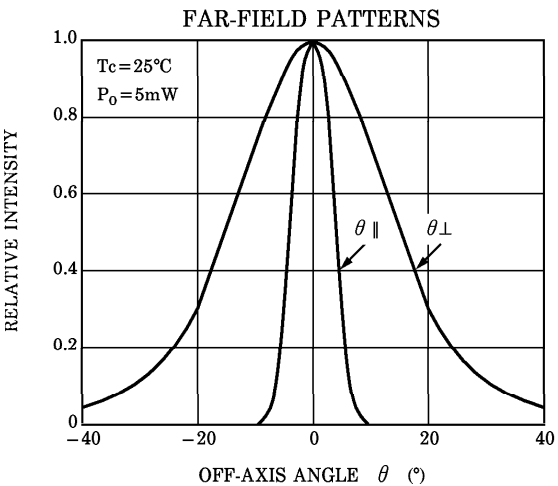
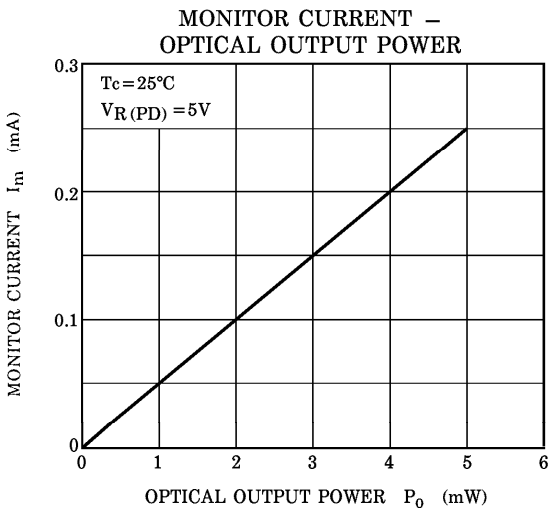
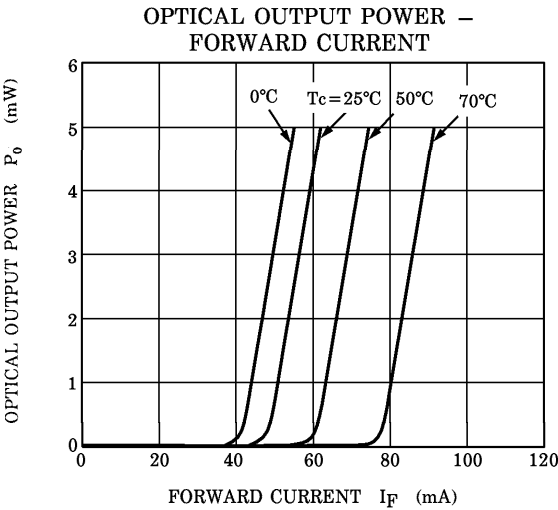
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Threshold Current	$I_{th}$	CW Operation	—	40	70	mA
Operation Current	$I_{op}$	$P_o = 5\text{mW}$	—	50	80	mA
Operation Voltage	$V_{op}$	$P_o = 5\text{mW}$	—	2.2	3.0	V
Lasing Wavelength	$\lambda_p$	$P_o = 5\text{mW}$	640	650	660	nm
Beam Divergence	$\theta_{  }$	$P_o = 5\text{mW}$	5	8	12	$^\circ$
	$\theta_{\perp}$	$P_o = 5\text{mW}$	24	28	35	$^\circ$
Monitor Current	$I_m$	$P_o = 5\text{mW}$	0.07	0.25	0.5	mA
PD Dark Current	$I_D(\text{PD})$	$V_R = 5\text{V}$	—	—	100	nA
PD Total Capacitance	$C_T(\text{PD})$	$V_R = 5\text{V}, f = 1\text{MHz}$	—	—	20	pF

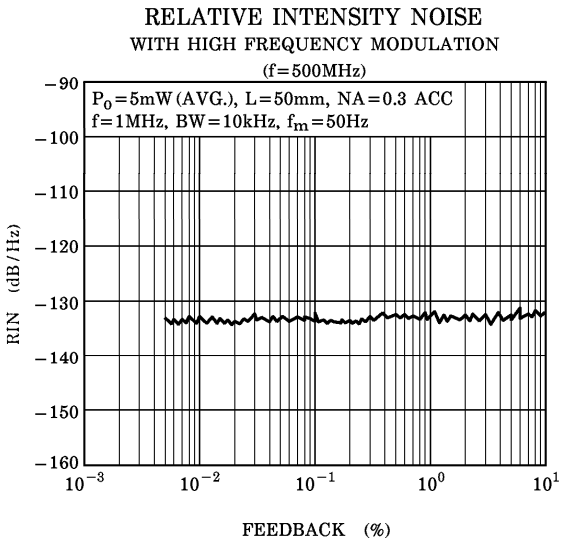
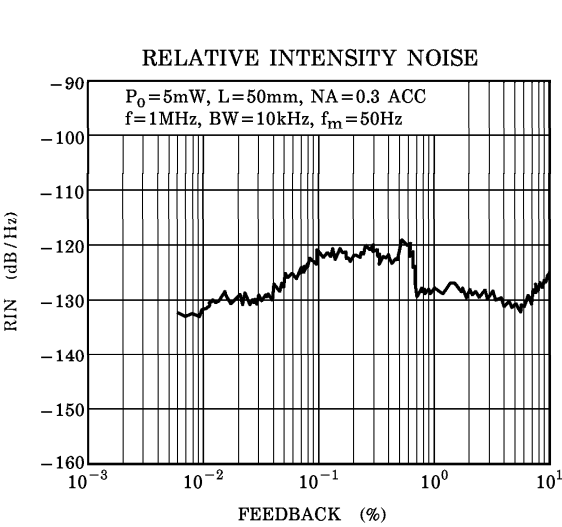
## PRECAUTIONS :

1. Be careful never to exceed, even momentarily, the maximum ratings. The laser diode is damaged by spike current which can be generated when switching the power ON or 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 maximum ratings.
2. Effective heat sinking should be performed, because temperature rise causes decrease of optical output power. Use a thermal radiator to reduce the temperature rise.
3. Prevent electrostatic discharge and electric spike which may damage the laser diode. The following precautions should be taken when using a laser diode.
  1. Set the electrical potential of the work bench to be the 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. Do not apply excessive stress between the package and the leads, because it deteriorates hermeticity. If the leads are formed, soldering should be performed after lead forming.  
Soldering temperature : 260°C MAX Soldering time : 5s MAX  
(soldering portion of leads : up to 2mm from the body of the device)
5. Take care not to touch the window glass. Contamination and scratches on the window glass surface will result in decreased optical output power and distorted far-field patterns.
6. 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.



7. Toshiba Visible Laser Diodes are available in two types of carton to which the following warning labels are attached : –
    1. Envelope Package (1 piece) : warning labels are included on the reverse side of the individual envelope
    2. Tray Package (200 pieces) warning labels are attached to the top of the external carton that contains the tray.
- (\*) due to the small size of the laser diodes, the warning labels are placed on the laser diode packaging and not on the individual laser diodes.





**RESTRICTIONS ON PRODUCT USE**

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- 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.
- 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. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
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