

SPECIFICATIONS

Laser Diode

GH07P28F4C



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LIGHTING BUSINESS UNIT
ELECTRONIC COMPONENTS AND DEVICES BU
SHARP CORPORATION

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2. When using this product, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets, as well as the precautions mentioned below. Sharp assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets, and the precautions mentioned below.

(Precautions)

- (1) Please do verify the validity of this part after assembling it in customer's products, when customer wants to make catalogue and instruction manual based on the specification sheet of this part.
- (2) This products is designed for use in the following application areas;

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

If the use of the product in the above application areas is for equipment listed in paragraphs (2) or (3), please be sure to observe the precautions given in those respective paragraphs.

- (3) Appropriate measures, such as fail-safe design and redundant design considering the safety design of the overall system and equipment, should be taken to ensure reliability and safety when this product is used for equipment which demands high reliability and safety in function and precision, such as ;
 - * Transportation control and safety equipment (aircraft, train, automobile etc.)
 - * Traffic signals * Gas leakage sensor breakers
 - * Rescue and security equipment * Other safety equipment
- (4) Please do not use this product for equipment which require extremely high reliability and safety in function and precision, such as ;
 - * Space equipment * Telecommunication equipment (for trunk lines)
 - * Nuclear power control equipment * Medical equipment
- (5) Please contact and consult with a Sharp sales representative if there are any questions regarding interpretation of the above three paragraphs.

3. Please contact and consult with a Sharp sales representative for any questions about this product.

■ Notice

4. Disclaimer

The warranty period for Sharp product is one (1) year (or six (6) months in case of generalized product) after shipment.

During the period, if there are any products problem, Sharp will repair (if applicable), replace or refund. Except the above, both parties will discuss to cope with the problems.

The failed Sharp product after the above one (1) year (or six (6) month for generalized product) period will be coped with by Sharp, provided that both parties shall discuss and determine on sharing responsibility based on the analysis results thereof subject to the above scope of warranty.

The warranty described herein is only for Sharp product itself which are purchased by or delivered to customer. Damages arising from Sharp product malfunction or failure shall be excepted.

Sharp will not be responsible for the Sharp product due to the malfunction or failures thereof which are caused by:

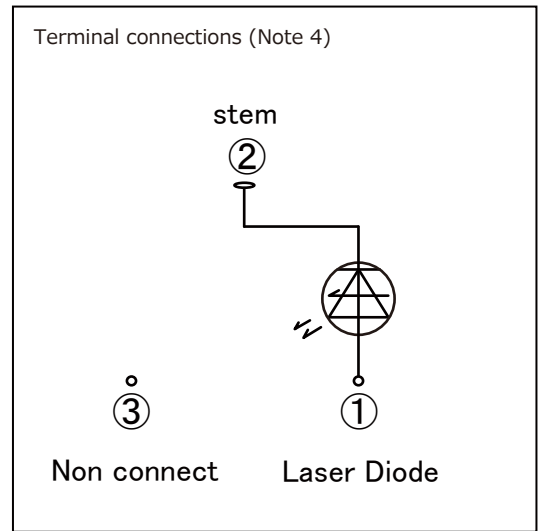
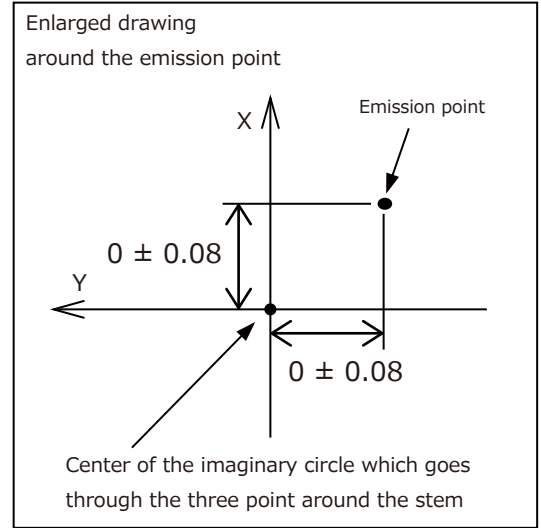
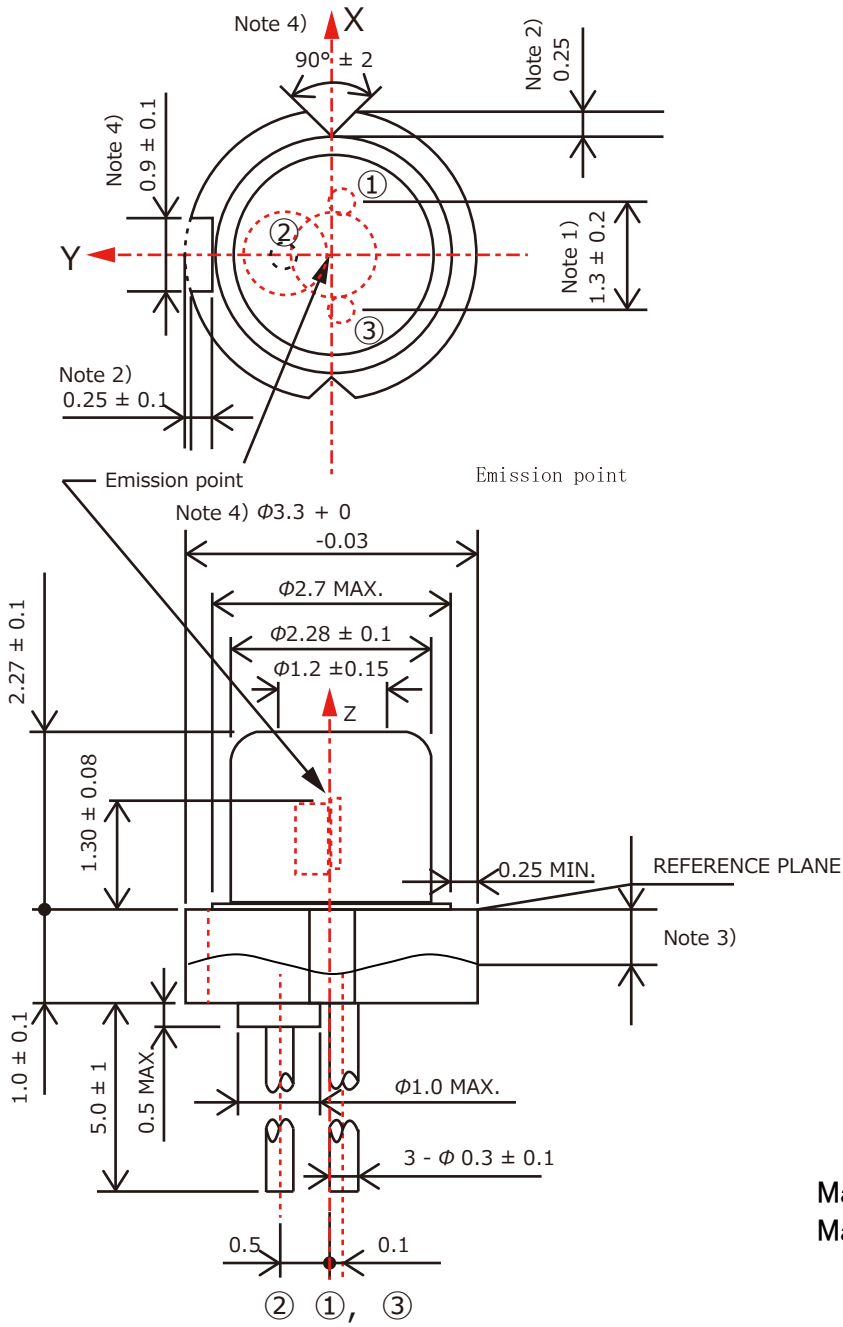
- (1) storage keep trouble during the inventory in the marketing channel.
- (2) intentional act, negligence or wrong/poor handling.
- (3) equipment which Sharp products are connected to or mounted in.
- (4) disassembling, reforming or changing Sharp products.
- (5) installation problem.
- (6) act of God or other disaster (natural disaster, fire, flood, etc.)
- (7) external factors (abnormal voltage, abnormal electromagnetic wave, fire, etc.)
- (8) special environment (factory, coastal areas, hot spring area, etc.)
- (9) phenomenon which cannot be foreseen based on the practical technologies at the time of shipment.
- (10) the factors not included in the product technical sheet.

5. Please contact and consult with a Sharp sales representative for any questions about Sharp product.

■ Operating and handling precautions

- (1) This product has its life. The product life which is described in "Reliability" should be taken into account when using it.
- (2) This product will be damaged by electrostatic discharge(ESD). Following precautions should be taken to avoid ESD damage.
 - ⇒ Workers, workbenches and other equipment should always be grounded. Workers should always wear an antistatic wrist strap and an antistatic smock on them.
 - ⇒ When handling this product, workers should always wear antistatic gloves or finger covers.
 - ⇒ A stable DC power supply which is free from electrical transients should always be used when operating this product. A slow starter circuit should always be inserted between the power supply and this product in order to protect it from DC power surges.
 - ⇒ Optical power output of this product should be set with a highly reliable and high quality variable resistance.
 - ⇒ This product should always be connected to the driving circuit by soldering directly or through highly reliable connectors.
 - ⇒ While this product is being operated, be sure to avoid touching the driving circuit or the terminals of this product with electrical probes from a synchroscope or a voltmeter.
 - ⇒ An antistatic package should be used when storing this product.
 - ⇒ This product should be processed in the rooms where relative humidity is kept at 50-70%RH.
- (3) This product doesn't do the design that intends use in the following, special environment. Please use it after confirming the performance and reliability, etc. enough in your company before use in the following special environment.
 - ⇒ Use in place where a lot of moisture, be dewys, sea breezes, or causticity gases (Cl, H₂S, NH₃, SO₂, and NO_X, etc.) exist.
 - ⇒ Use under direct sunshine, in out-of-door exposure, or in dust.
 - ⇒ Use in atmosphere such as water, oil, drug solutions, or organic solvents.
 - ⇒ Use in environment with strong static electricity or electromagnetic radiation.
 - ⇒ Use in state installed near generation of heat parts or in state to arrange combustible near this product.
- (4) In this Product, generation of heat happens in the laser chip because of operating. The case temperature rises by this generation of heat. Because the rise of the case temperature becomes a factor to shorten the lifetime of this product, a sufficient heat sink should be attached to this product when operating so that its case temperature is to be maintained at the same level as that of the surrounding.
- (5) Even if the drive current supply has an automatic power control (APC), automatic current control (ACC), or both, be sure to monitor the optical power output with an optical power meter while setting it. Never estimate the optical power output only from the drive current because it is likely to be decreased by temperature rise of the surrounding.
- (6) Although the beam emitted by this laser diodes is nearly invisible, it will be harmful to the human eyes. So the following precautions should be taken.
 - ⇒ When this product is being operated, the emitting surface of a chip should not be viewed either directly or through a lens, microscope or optical fibers.
 - ⇒ When operating this product, wear safety glasses.
- (7) When soldering this product, heat lead pins only using a soldering iron in short time. Avoid heat the whole package using pre-heat or reflow soldering.

■ Outline dimensions and Terminal connections



Mass of the product : 0.095g (reference value)
 Marking
 Position : top of a cap
 Printed contents : □□fp□□

Note 1) Dimension of the bottom of leads.

Note 2) These dimensions are defined from the imaginary circle which goes through the three points around the stem to the bottom of cut off parts.

Note 3) These dimensions are valid only in the range of 0 ~ 0.5mm below from the reference plane.

Note 4) Please don't connect the lead pin No.3 to the driving circuit.

■ Ratings and Characteristics

Absolute Maximum Ratings

(Tc=25°C(Note 1))

Parameter	Symbol	Value	Unit	
Optical power output (CW)	Po	155	mW	
Optical power output (pulse) (Note 2)	Pp	280	mW	
Reverse voltage	Vrl	2	V	
Operating temperature (Case temperature)	CW (Note 3)	Topc (c)	-10 ~ +70	°C
	Pulse (Note 2)	Topc (c)	-10 ~ +70	°C
Storage temperature (Case temperature)	Tstg	-40 ~ +85	°C	
Soldering temperature (Note 4)	Tsld	350	°C	

(Note 1) Tc : Case temperature

(Note 2) Pulse :Pulse Operation(Pulse Width 100ns Duty:50%)

(Note 3) CW:Continuous Wave Operation

(Note 4) Soldering temperature means soldering iron tip temperature (The power 30W) while soldering.
Soldering position is 1.6mm apart from bottom edge of the case.(Immersion time: ≤3s)

Electro-optical Characteristics

(Tc=25°C(Note 1))

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Threshold current	Ith	-	-	35	45	mA	
Operating current	Iop	Po = 100 mW	-	135	165	mA	
Operating voltage	Vop		-	2.4	2.8	V	
Wavelength	λp		779	784	789	nm	
Half Intensity Angle (Parallel) (Note 2,3)	θ"		6	8	10	°	
Half Intensity Angle (Perpendicular) (Note 2,3)	θ⊥		14	16	18	°	
Ripple (Note 4)	RI		-20	-	+20	%	
Misalignment angle (Parallel) (Note 3)	Δθ"		-3	-	+3	°	
Misalignment angle (Perpendicular) (Note 3)	Δθ⊥		-3	-	+3	°	
Differential efficiency	ηd		$\frac{70\text{mW}}{I(100\text{mW})-I(30\text{mW})}$	0.8	1.0	-	mW/mA
Visibility (Note 5)	α		Po = 100 mW	-	-	1	-
Kink_CW (Note 6)	K-LI	P1=30mW,P2=90mW,P3=150mW	-10	-	10	%	
Kink_Pulse (Note 6,7)	K-LI	P1=56mW,P2=168mW,P3=280mW	-10	-	10	%	

(Note 1) Initial value, Continuous Wave Operation

(Note 2) Angle of 50% peak intensity (Full angle at half-maximum)

(Note 3) Parallel to the junction plane(X-Z plane) Perpendicular to the junction plane(Y-Z plane)

(Note 4) $RI \equiv \Delta P/P$ ΔP:the maximum deviation of the far field pattern from its approximate curve
P:the peak of the approximate curve

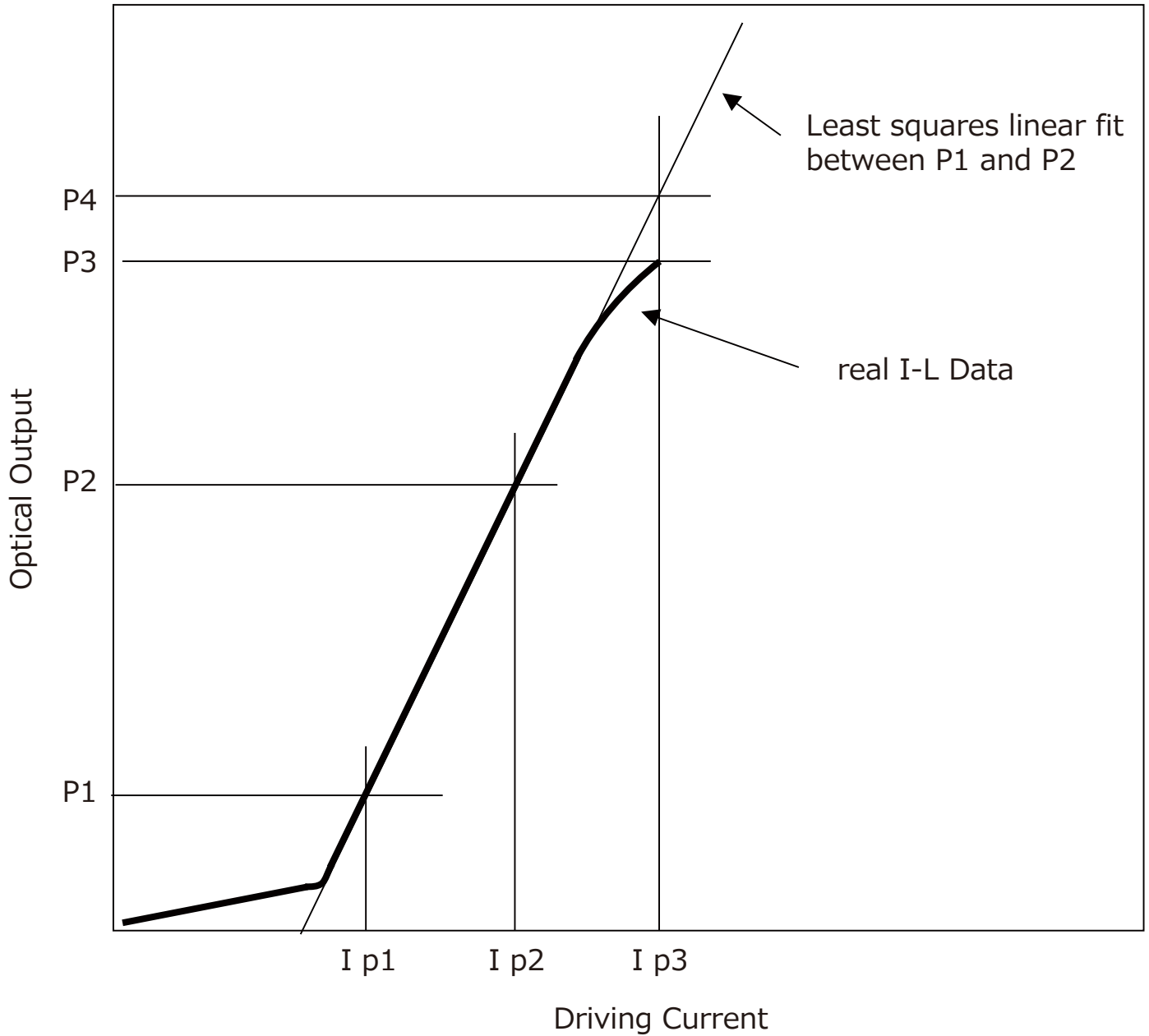
(Note 5) Visibility is measured by optical spectrum analyzer model No. Q8344A(ADVANTEST Corporation).

(Note 6) Refer to the measurement method described in page 5/9

(Note 7) Pulse :Pulse Operation(Pulse Width 100ns Duty:50%)

(Note 6) Definition of K-LI

$$K - L I = (P 4 - P 3) / P 3$$



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<http://www.sharp-world.com/products/device/>

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- technicals are subject to change without notice for improvement.