

GH6M005A5B

3mm Thickness Resin type Hologram Laser for Playback Only MD Player

■ Features

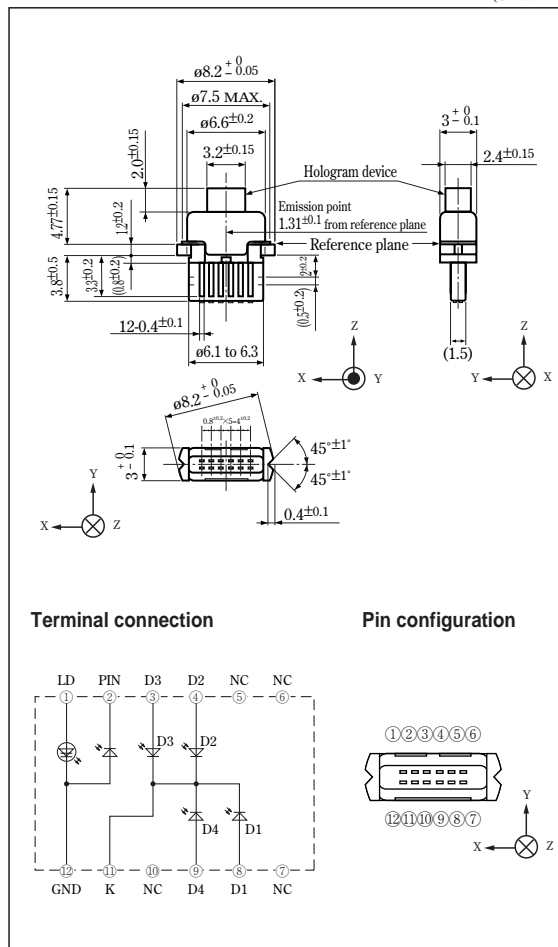
- (1) Super-thin package (3mm thickness) due to insert frame structure
- (2) Operating current
I_{op} : TYP. 28mA

■ Applications

- (1) Playback only MD players

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(T_c=25°C)

Parameter	Symbol	Rating	Unit
※1 Optical power output	P _H	4.5	mW
Reverse voltage	Laser	2	V
	Photodiode	30	V
	Signal detection photodiode	15	V
※2 Operating temperature	T _{opr}	-10 to +60	°C
※2 Storage temperature	T _{stg}	-40 to +85	°C
※3 Soldering temperature	T _{sold}	260	°C

※1 Output power from hologram laser CW (Continuous Wave) drive

※2 Case temperature

※3 At the position of 1.6mm from the lead base (Within 5s)

SHARP

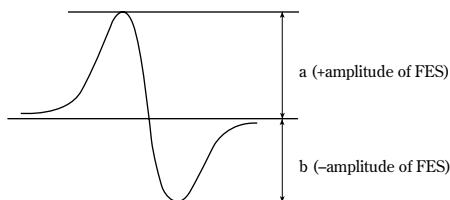
Notice In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.
Internet Internet address for Electronic Components Group <http://sharp-world.com/ecg/>

■ Electro-optical Characteristics

(T_c=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Focal offset	DEF	Collimated lens output power PCL=1.1mW	-0.5	-	+0.5	μm
*1 Focal error symmetry	B _{FES}		-15	-	+15	%
*2 Radial offset	-		80	-	120	%
*3 FES output amplitude	I _{FES}		2.0	4.2	6.1	μA
*4 Main spot balance	MSB		70	100	130	%
*5 Stray light	-	P _H =4mW	-	-	0.1	μA
Threshold current	I _{th}	-	1	20	30	mA
Operating current	I _{op}	P _H =2.7mW	5	28	40	mA
Operating voltage	V _{op}		-	1.9	2.2	V
Wavelength	λ _p		770	780	790	nm
Output current	I _m	P _H =2.7mW, V _R =15V	0.001	-	0.2	mA
Differential efficiency	η _d	$\frac{1.8\text{mW}}{I(2.7\text{mW})-I(0.9\text{mW})}$	0.2	0.6	1.0	mW/mA

*1 (a-b) / (a+b)

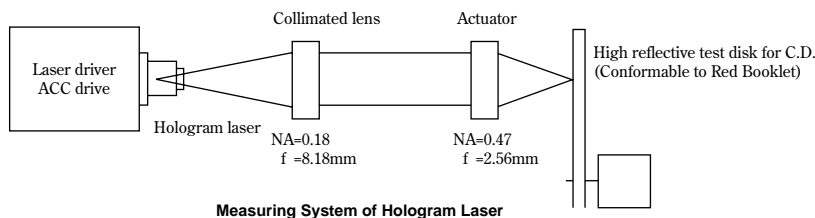


*2 D1 / D4 (focal servo ON)

*3 D2-D3 (Focal vibration)

*4 (D1+D4) / (D2+D3)

*5 Output of D2, D3 when hologram output is 4mW and outside light is cut off.



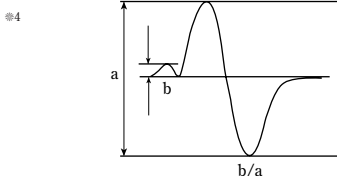
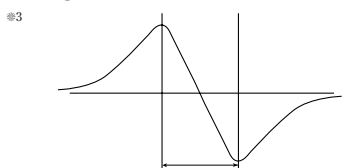
■ Electro-optical Characteristics of Hologram Laser (Design Standard*)

(Tc=25°C)

Parameter	Conditions	MIN.	TYP.	MAX.	Unit
① RF output amplitude	P _{CL} =1.1mW	5	8.4	-	μA
② RES output amplitude		1	2	3.5	μA
③ Focal error signal capture range		-	19	-	μm
④ Focal error noise		-7	-	+7	%
Space between main and sub beam	Disc surface	-	19.7	-	μm

① Amplitude of D1+D2+D3+D4 (focal servo ON, radial servo ON)

② Amplitude of D1-D4 (focal servo ON)



■ Optical Characteristics of Hologram Device (Design Standard*)

(Tc=25°C)

Parameter	Conditions	MIN.	TYP.	MAX.	Unit
Transmissive wave aberration	-	-	-	λ/8	-
Surface parallelism	-	-	-	5	min.
Hologram diffraction efficiency (0 : 1)	λ _p =780nm	-	80 : 8	-	%
Grating diffraction intensity ratio (0 : 1)		9 : 1	10.5 : 1	12 : 1	-
Grating diffraction intensity ratio (+1 : -1)		0.9	1	1.1	-
Grating rotation angle		to hologram parting line	-	1.16	-

■ Electro-optical Characteristics of Laser Diode (Without Hologram Device) (Design Standard*)

(Tc=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Half intensity angle	Parallel	P _o =3mW	9	-	18	°	
			28	-	45	°	
	Perpendicular		θ//	-2	-	+2	°
			θ⊥	-3	-	+3	°
Misalignment position	ΔX, Y, Z	-	-80	-	+80	μm	
Kink	LKink	-	-15	-	+15	%	
Interference pattern intensity	α	P _o =3mW	-	-	0.95	-	
Chip thickness	-	Active layer to chip edge	-	-	55	μm	

■ Electrical Characteristics of Monitor Photodiode (Design Standard*)

(Tc=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Dark current	I _D	V _R =15V	-	-	150	nA
Terminal capacitance	C _t		-	9	-	pF

■ Electro-optical Characteristics of Photodiode for Signal Detection (Design Standard*)

(Tc=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Reverse voltage	V _R	I _R =10μA	12.5	-	50	V
Terminal capacitance	D2, D3	V _R =12.5V, f=1MHz	1.2	-	5	pF
	D1, D4		1.4	-	5.8	
Sensitivity	S	λ _p =780nm	0.4	0.5	0.65	A/W
Response time	D2, D3	V _R =15V, R _L =180Ω	-	10	120	ns
	D1, D4		-	10	200	

* These parameters are not guaranteed performance, but general specifications of each optical element which makes up a hologram laser.

• Please refer to the chapter "Handling Precautions"

SHARP

NOTICE

- The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.
- Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.
- Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:
 - (i) The devices in this publication are designed for use in general electronic equipment designs such as:
 - Personal computers
 - Office automation equipment
 - Telecommunication equipment [terminal]
 - Test and measurement equipment
 - Industrial control
 - Audio visual equipment
 - Consumer electronics
 - (ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
 - Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
 - Traffic signals
 - Gas leakage sensor breakers
 - Alarm equipment
 - Various safety devices, etc.
 - (iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
 - Space applications
 - Telecommunication equipment [trunk lines]
 - Nuclear power control equipment
 - Medical and other life support equipment (e.g., scuba).
- Contact a SHARP representative in advance when intending to use SHARP devices for any "specific" applications other than those recommended by SHARP or when it is unclear which category mentioned above controls the intended use.
- If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Law of Japan, it is necessary to obtain approval to export such SHARP devices.
- This publication is the proprietary product of SHARP and is copyrighted, with all rights reserved. Under the copyright laws, no part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, in whole or in part, without the express written permission of SHARP. Express written permission is also required before any use of this publication may be made by a third party.
- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.