GH5C105B3A

Compact Hologram Laser for Automotive CD-ROM Drive

■ Features

(1) Wide operating temperature for use in automotive equipment
(2) With built-in OPIC※ (response speed : MIN. 3MHz) (Both for CD car navigation systems and CD players)
(3) Super-thin (4.8mm thickness) and compact package enables thin and compact pick-up design.
(4) With built-in beam splitter and diffraction grating

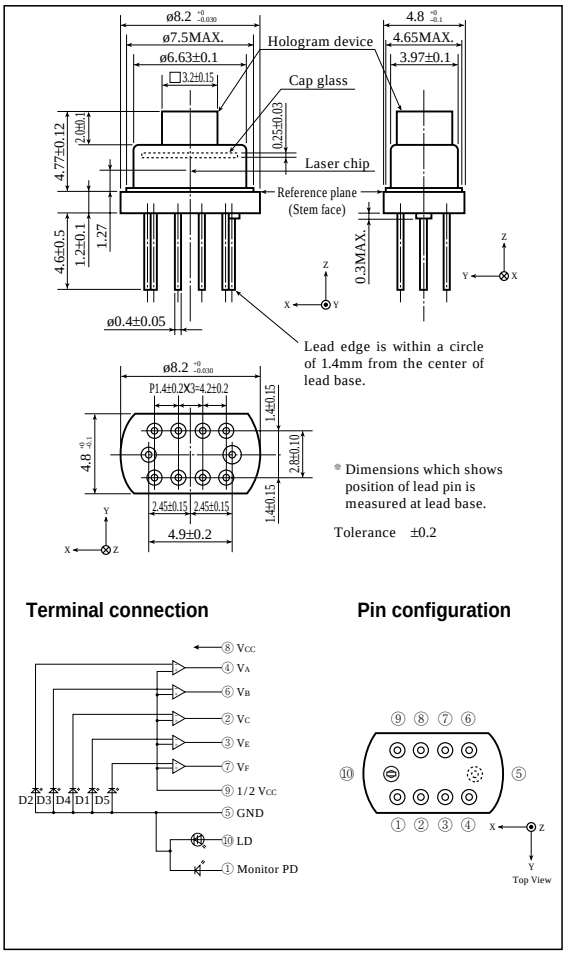
※OPIC : (Optical IC) is a trademark of SHARP Corporation. An OPIC consists of a light-detecting element and a signal-processing circuit integrated onto a single chip.

■ Applications

(1) CD players for automotive use
(2) CD car navigation systems

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(TC=25˚C)

Parameter		Symbol	Rating	Unit
※1 Optical power output		PH	4.3	mW
Reverse voltage	Laser	VR	2	V
	Monitor photodiode		30	V
OPIC supply voltage		VCC	6	V
※2 Operating temperature		Topr	-10 to +80	˚C
※2 Storage temperature		Tstg	-40 to +85	˚C
※3 Soldering temperature		Tsold	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)

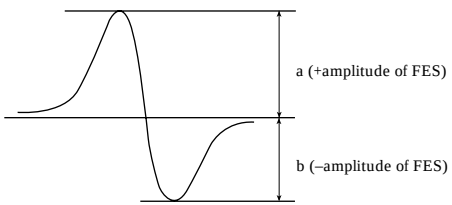
■ Electro-optical Characteristics

(V_{CC}=5V, T_C=25°C)

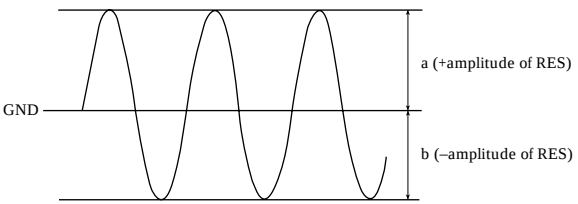
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
※1 Focal offset	DEF	V_{RF}=1.1V	-0.7	-	+0.7	µm
※2 Focal error symmetry	B_{FES}	V_{RF}=1.1V	-25	-	+25	%
※3 Radial error balance	B_{RES}	P_H=3.0mW	-25	-	+25	%
※4 RF output amplitude	V_{RF}	P_H=3.0mW	0.90	(1.70)	2.80	V
※5 FES output amplitude	V_{FES}	V_{RF}=1.1V	0.46	(0.70)	0.94	V
※6 RES output amplitude	V_{RES}	V_{RF}=1.1V	0.16	(0.23)	0.31	V
Threshold current	I_{th}	−	-	(25)	39	mA
Operating current	I_{op}	P_H=2.7mW	-	(36)	50	mA
Operating voltage	V_{op}	P_H=2.7mW	-	(1.75)	2.5	V
Wavelength	λ_p	P_H=2.7mW	770	(780)	795	nm
Output current	I_m	P_H=2.7mW, V_R=15V	(0.12)	(0.55)	1.00	mA
Differential efficiency	η_d	$\frac{1.8mW}{I(2.7mW)-I(0.9mW)}$	0.17	(0.27)	0.55	mW/mA

※1 Distance between FES=0 and jitter minimum point
At the condition of FES sensitivity = 20%/1µm

※2 (a–b) / (a+b)



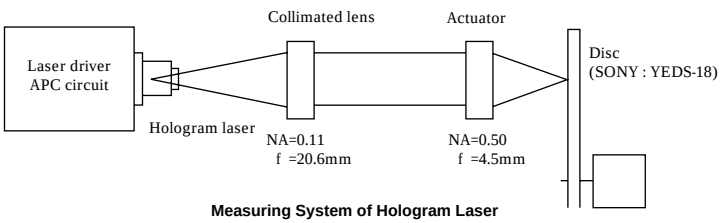
※3 $\frac{a-b}{2\times(a+b)}$ Offset of hologram laser is included.



※4 Amplitude of $V_A+V_B+2V_C$ (focal servo ON, radial servo ON)

※5 $V_A–V_B$ (Focal vibration)

※6 $V_E–V_F$ (focal servo ON, radial servo OFF)



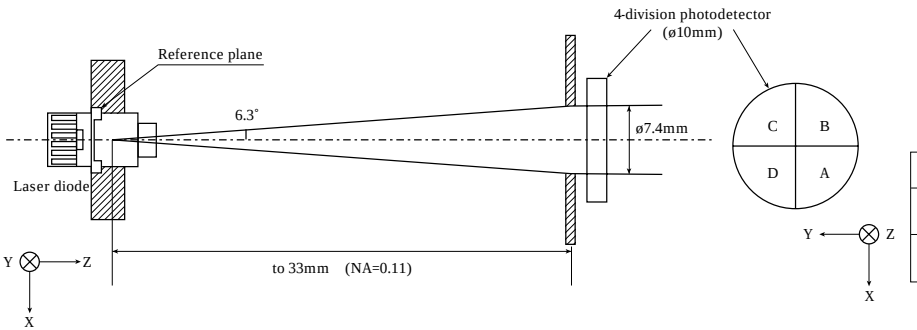
Measuring System of Hologram Laser

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

(Tc=25˚C)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Emission characteristics	※1 Symmetry	Parallel	S//	Po=3mW, Into NA=0.11	-25	-	+25	%
		Perpendicular	S⊥		-15	-	+15	%
Misalignment position			Δx	–	-80	-	+80	μm
			Δy		-80	-	+80	μm
			Δz		-80	-	+80	μm
Interference pattern intensity			α	Po=3mW	-	-	0.97	-

※1 Measuring method of radiation symmetry



Parameter	Definition
S//	$\frac{(P_B + P_C) - (P_A + P_D)}{P_A + P_B + P_C + P_D}$
S⊥	$\frac{(P_A + P_B) - (P_C + P_D)}{P_A + P_B + P_C + P_D}$

P_X : Output of light detector X

■ Electrical Characteristics of Monitor Photodiode (Design Standard*)

(Tc=25˚C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
※2 Sensitivity	S	V_R=15V	-	0.20	-	mA/mW
Dark current	I_D		-	-	150	nA
Terminal capacitance	C_t		-	3.5	-	pF

※2 For hologram output power

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

(Tc=25˚C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	※3 Segment
Supply voltage	V_{CC}		3.0	-	5.5	V	
Supply current	I_{CC}	V_{CC}=5V	2	5	10	mA	
※4 Output offset voltage	V_{OD}	V_{CC}=5V	-25	0	+25	mV	V_{A-F}
Offset voltage difference	ΔV_{OD}	No light	-15	0	+15	mV	V_A-V_B, V_E-V_F
Response frequency	f_{CF}	※5 V_{CC}=5V, -3dB	3	5	-	MHz	V_A, V_B, V_C
	f_{CR}	R_L=10kΩ	0.5	1	-	MHz	V_E, V_F

※3 Applicable divisions correspond to output terminals.

※4 Difference from Vcc/2

※5 Output amplitude=0dB (input signal 100kHz) BW=10kHz

D1	
D2	D4
D3	
D5	

Segment No. Output

D 1 .....V_E
D 2 .....V_A
D 3 .....V_B
D 4 .....V_C
D 5 .....V_F

* 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"

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