GH5D305B3D

Red Hologram Laser for DVD Car Navigation System / DVD Player for Automobile Use

■ Features

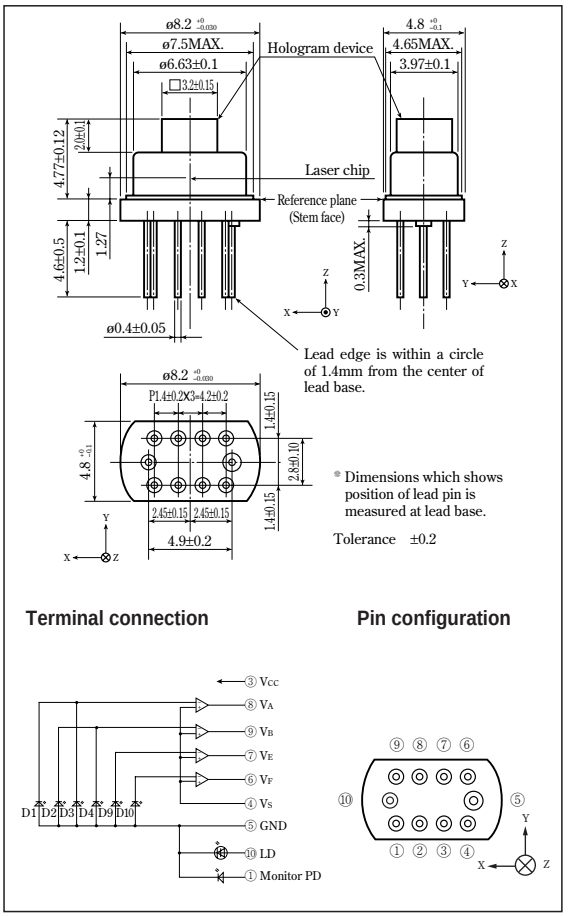
(1) With built-in OPIC※ for DVD car navigation system (Response frequency : MIN. 40MHz)
(2) Wide operating temperature for automobile use (Topr : -20 to +80˚C)
(3) 4.8mm thickness
(4) With built-in beam splitter and diffraction grating
(5) Reasonable price

■ Applications

(1) DVD car navigation systems
(2) DVD players for automobile use

■ Outline Dimensions

(Unit : mm)



Terminal connection

Pin configuration

■ Absolute Maximum Ratings

(Tc=25˚C)

Parameter		Symbol	Rating	Unit
※1 Optical power output		PH	4.5	mW
Reverse voltage	Laser	VR	2	V
	Monitor photodiode		30	V
OPIC supply voltage		VCC	6	V
※2 Operating temperature		Topr	-20 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)

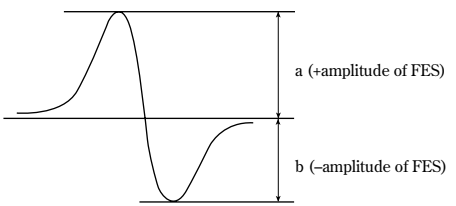
■ Electro-optical Characteristics

(V_{CC}=5V, Vs=1/2 V_{CC}, T_C=25°C)

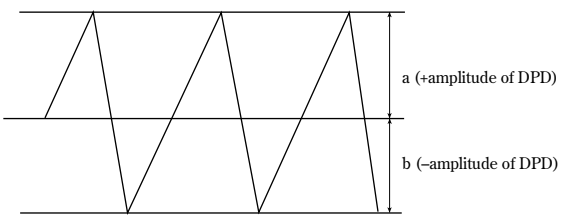
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
※1 Focal offset	DEF	V_{RF}=0.83V	-0.5	-	+0.5	μm
※2 Focal error symmetry	B_{FES}	V_{RF}=0.83V	-20	-	+20	%
※3 Radial error balance	B_{RES}	P_H=3.0mW	-20	-	+20	%
※4 RF output amplitude	V_{RF}	P_H=3.0mW	0.55	0.83	1.11	V
※5 FES output amplitude	V_{FES}	V_{RF}=0.83V	0.29	0.44	0.61	V
Threshold current	I_{th}	–	-	30	38	mA
Operating current	I_{op}	P_H=2.85mW	-	40	49	mA
Operating voltage	V_{op}	P_H=2.85mW	-	2.5	2.77	V
Wavelength	λ_p	P_H=2.85mW	640	654	660	nm
Output current	I_m	P_H=2.85mW, V_R=15V	0.05	(0.2)	0.3	mA
Differential efficiency	η_d	$\frac{1.9mW}{I(2.85mW)-I(0.95mW)}$	0.34	0.52	0.75	mW/mA
※6 Main spot balance	MSB	P_H=3.0mW	75	-	125	%
※7 Radial spot balance	RSB	P_H=3.0mW	75	-	125	%

※1 Distance between FES=0 and jitter minimum point

※2 (a–b) / (a+b)



※3 DPD signal $\frac{a-b}{2\times(a+b)}$

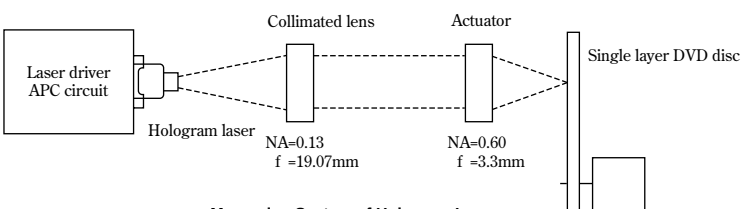


※4 RF output amplitude (focal servo ON, radial servo ON)

※5 V_A–V_B (Focal vibration)

※6 (V_A+V_B) / (V_E+V_F) (focal servo ON, radial servo OFF)

※7 V_E / V_F



Measuring System of Hologram Laser

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

(T_C=25°C)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Half intensity angle		Parallel	θ//	Po=3mW	6.9	8.5	10	°
		Perpendicular	θ⊥		25	30	35	°
Emission characteristics	Deviation angle	Parallel	ø//		-2.1	-	+2.1	°
		Perpendicular	ø⊥		-3	-	+3	°
Misalignment position			Δx	–	-80	-	+80	μm
			Δy		-80	-	+80	μm
			Δz		-80	-	+80	μm
Interference pattern intensity			α	Po=3mW	-	-	1	-

■ Electrical Characteristics of Monitor Photodiode (Design Standard*)

(T_C=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
※1 Sensitivity	S	V_R=15V	-	0.07	-	mA/mW
Dark current	I_D		-	-	150	nA
Terminal capacitance	C_t		-	9	-	pF

※1 For hologram output power

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

(T_C=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	※2 Segment
Supply voltage	V_{CC}	–	4.5	-	5.5	V	-
Reference voltage	V_S	V_S=1/2 V_{CC}	2.25	-	2.75	V	-
Supply current	I_{CC}	V_{CC}=5V	6	10	15	mA	-
※3 Output offset voltage	V_{OD}	V_{CC}=5V, No light	-30	-	30	mV	V_A, V_B, V_E, V_F
Offset voltage difference	ΔV_{OD}		-30	-	30	mV	V_A, V_B, V_E, V_F
※4 Response frequency	f_{CF}	V_{CC}=5V, -3dB	40	-	-	MHz	V_A, V_B, V_E, V_F
※5 Peaking level	V_{PK}	f=1 to 20MHz, BW=10kHz	-2	-	2	dB	V_A, V_B, V_E, V_F

※2 Applicable divisions correspond to output terminals.

D10
D4
D3
D2
D1
D9

Segment No.	Output
D 1 + D 3	V_A
D 2 + D 4	V_B
D 9	V_E
D 10	V_F

※3 Difference from Vcc/2

※4 Output amplitude=0dB (input signal 100kHz)

※5 Output amplitude=0dB (input signal 100kHz), peaking characteristics from 1MHz to 20MHz.

※6 Noise solution against feed-back light (Radio frequency modulation circuit) is required.

* 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"

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.
-
- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.