GH5C105D3A/GH5C105D3B

Compact Size, Low Current Drive Hologram Laser for Audio/Video CD Player

■ Features

(1) With built-in OPIC* (TYP. 5MHz)
(2) Enables to design compact pick-up thanks to compact package (Thickness : 4.8mm)
(3) Voltage output type (External noise solution is unnecessary.)
(4) Low current drive (Operating current : TYP. 18mA)
(5) Maximum optical power output : 4.3mW
(6) Wavelength : 780nm

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

■ Model No.

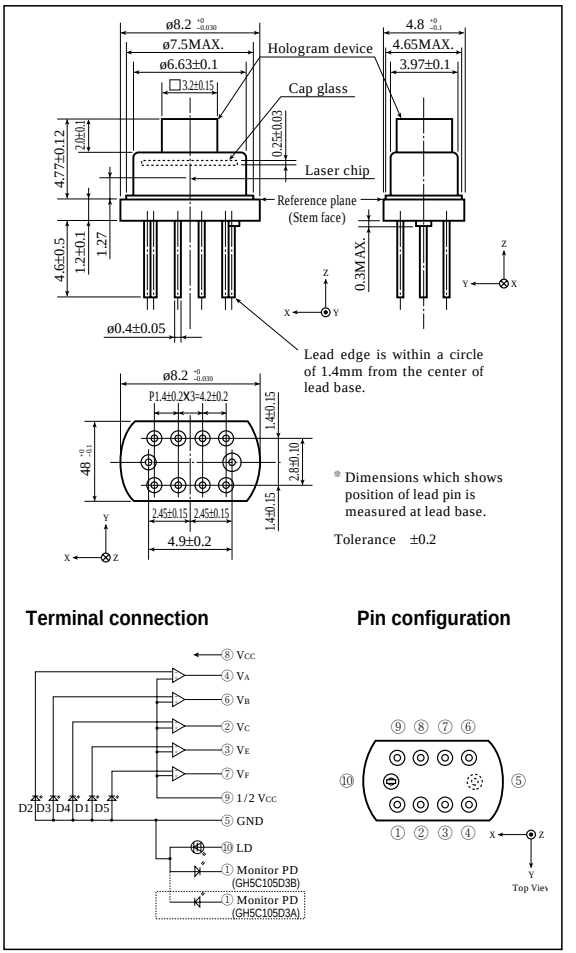
(1) GH5C105D3A....Dual power supply
(2) GH5C105D3B....Single power supply

■ Applications

(1) Audio CD drives
(2) Video CD drives

■ Outline Dimensions

(Unit : mm)



Terminal connection

Pin configuration

■ Absolute Maximum Ratings

(T_C=25°C)

Parameter		Symbol	Rating	Unit
*1 Optical power output		P_H	4.3	mW
Reverse voltage	Laser	V_R	2	V
	Monitor photodiode		30	V
OPIC supply voltage		V_{CC}	6	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
*2 Case temperature
*3 At the position of 1.6mm or more from the lead base (Within 5s)

■ Electro-optical Characteristics

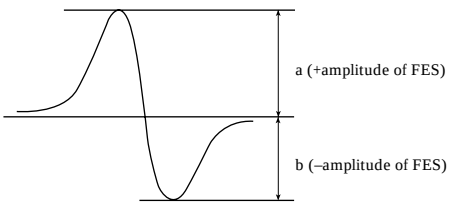
(Vcc=5V, Tc=25˚C)

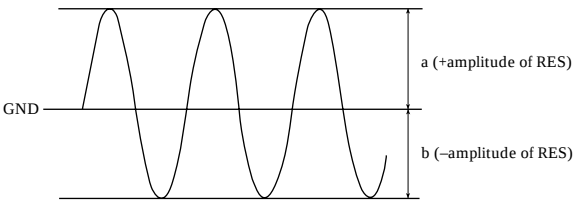
Parameter		Symbol	Conditions		MIN.	TYP.	MAX.	Unit
※1 Focal offset		DEF	V_{RF}=0.75V		-0.7	-	+0.7	µm
※2 Focal error symmetry		B_{FES}	V_{RF}=0.75V		-25	-	+25	%
※3 Radial error balance		B_{RES}	V_{RF}=0.75V		-25	-	+25	%
※4 RF output amplitude		V_{RF}	P_H=3.0mW		0.53	1.2	2.1	V
※5 FES output amplitude		V_{FES}	V_{RF}=0.75V		0.3	0.5	0.7	V
		I_{FES}						
※6 RES output amplitude		V_{RES}	V_{RF}=0.75V		0.12	0.21	0.29	V
		I_{RES}						
Jitter	GH5C105D3A	–	–		-	-	23	ns
Threshold current		I_{th}	–		-	13	18	mA
Operating current		I_{op}	P_H=2.7mW		-	18	22	mA
Operating voltage		V_{op}	P_H=2.7mW		-	1.8	2.2	V
Wavelength		λ_p	P_O=3mW		770	780	795	nm
Output current		I_m	P_H=2.7mW, V_R=15V	GH5C105D3A	0.048	0.13	0.24	mA
				GH5C105D3B	0.021	0.6	0.11	
Differential efficiency		η_d	$\frac{2mW}{I(3mW)-I(1mW)}$		-	0.65	-	mW/mA
Interference pattern intensity	GH5C105D3A	α	P_O=2mW		-	-	0.95	-

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

※2 (a–b) / (a+b)

※3 $\frac{a-b}{2\times(a+b)}$

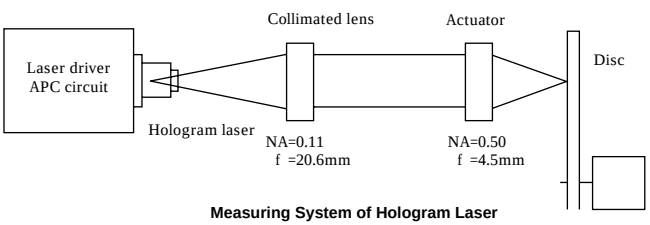




※4 Amplitude of V_A+Va+2V_C (focal servo ON, radial servo ON)

※5 V_B–V_A (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	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

■ Electrical Characteristics of Monitor Photodiode (Design Standard)

(GH5C105D3A)

(Tc=25˚C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
※1 Sensitivity	S	V_R=15V	-	0.048	-	mA/mW
Dark current	I_d	V_R=15V	-	-	150	nA
Terminal capacitance	C_t	V_R=15V	-	3.5	-	pF

(GH5C105D3B)

(Tc=25˚C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
※1 Sensitivity	S	V_R=15V	-	0.22	-	mA/mW
Dark current	I_d	V_R=15V	-	-	150	nA
Terminal capacitance	C_t	V_R=15V	-	9	-	pF

※1 For hologram output power

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

(Tc=25˚C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	※2 Segment
Supply voltage	V_{CC}		2.5	-	5.5	V	-
Supply current	I_{CC}	V_{CC}=2.5V	2	5	10	mA	-
※3 Output off-set voltage	V_{OD}	V_{CC}=2.5V, No light	-25	0	+25	mV	V_A to F
Off-set voltage difference	ΔV_{OD}		-15	0	+15	mV	V_A-V_B,V_E-V_F
Response frequency	f_{CF}	※4 V_{CC}=5V, -3dB	3	5	-	MHz	V_A,V_B,V_C
	f_{CR}	※4 V_{CC}=5V, -3dB	0.5	1	-	MHz	V_E,V_F
Temperature coefficient of sensitivity	R_{plt}	Ta= -20 to +70˚C	1660	-	-	ppm/˚C	V_A,V_B,V_C
			1422	-	-		V_E,V_F

※2 Applicable divisions correspond to pattern segment No.

※3 Difference from Vcc/2

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

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

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