

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.

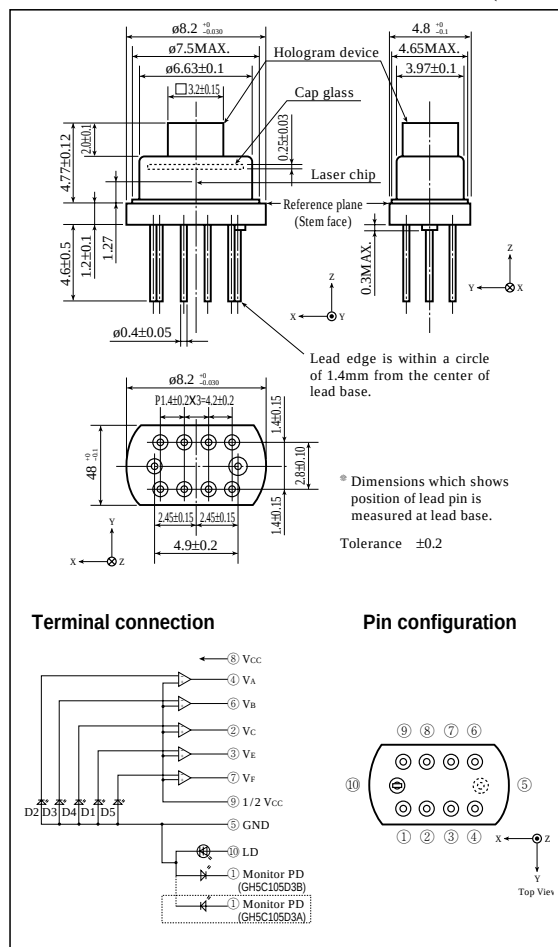
- (1) GH5C105D3A.....Dual power supply
- (2) GH5C105D3B.....Single power supply

■ Applications

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

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(T_c=25°C)

Parameter	Symbol	Rating	Unit
① Optical power output	P _H	4.3	mW
Reverse voltage	V _R	2	V
		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)

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■ Electro-optical Characteristics

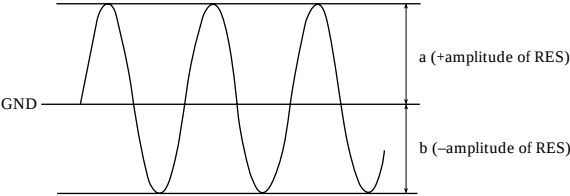
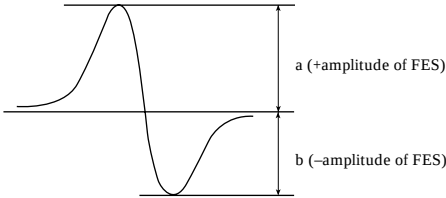
(Vcc=5V, Tc=25°C)

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	$\frac{2\text{mW}}{I(3\text{mW})-I(1\text{mW})}$	-	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)

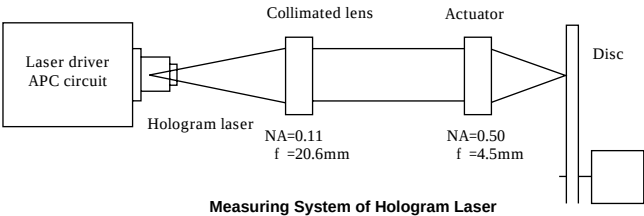
*3 $\frac{a-b}{2 \times (a+b)}$



*4 Amplitude of V_A+V_a+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)



■ 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	VR=15V	-	0.048	-	mA/mW
Dark current	Id	VR=15V	-	-	150	nA
Terminal capacitance	Ct	VR=15V	-	3.5	-	pF

(GH5C105D3B) (Tc=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*1 Sensitivity	S	VR=15V	-	0.22	-	mA/mW
Dark current	Id	VR=15V	-	-	150	nA
Terminal capacitance	Ct	VR=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	VCC		2.5	-	5.5	V	-
Supply current	ICC	VCC=2.5V	2	5	10	mA	-
*3 Output off-set voltage	VOD	VCC=2.5V, No light	-25	0	+25	mV	VA to F
Off-set voltage difference	ΔVOD		-15	0	+15	mV	VA,VB,VE,VF
Response frequency	fCF	*4 VCC=5V, -3dB	3	5	-	MHz	VA,VB,VC
	fCR	*4 VCC=5V, -3dB	0.5	1	-	MHz	VE,VF
Temperature coefficient of sensitivity	Rplt	Ta= -20 to +70°C	1660	-	-	ppm/°C	VA,VB,VC
			1422	-	-		VE,VF

*2 Applicable divisions correspond to pattern segment No.

*3 Difference from Vcc/2

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

Segment No.		Output
D1	D4	D 1VE
D2		D 2VA
D3		D 3VB
D5		D 4VC
		D 5VF

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