

GH5R385C3C

High Power Output Hologram Laser for X12 Speed CD-R Drive

■ Features

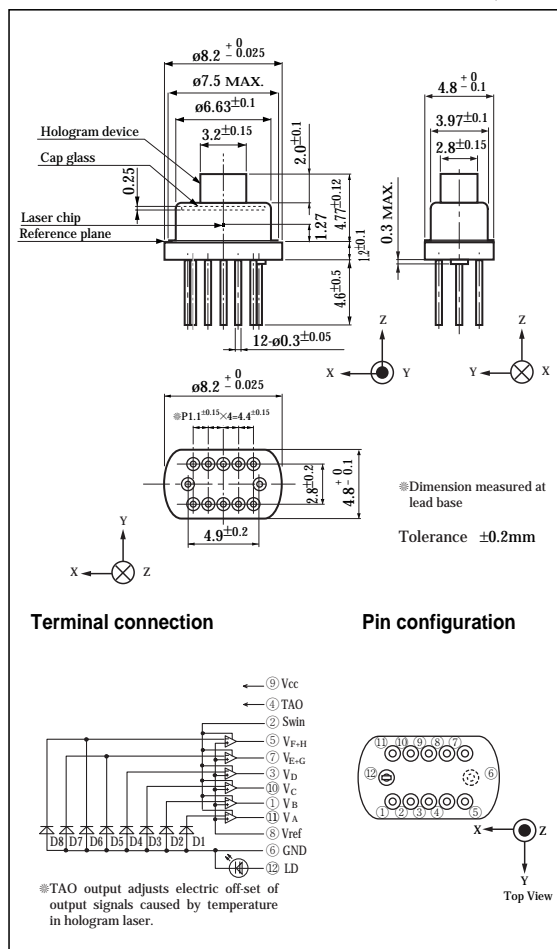
- (1) High power output (pulse MAX. 108mW)
 - (2) For X12 speed CD-R, X24 to X32 speed CD-ROM
(With built-in MIN. 30MHz OPIC[®])
 - (3) φ4.8mm thickness package
 - (4) With built-in beam splitter and diffraction grating
- [®]OPIC : (Optical IC) is a trademark of SHARP Corporation.
An OPIC consists of a light-detecting element and a signal-processing circuit integrated onto a single chip.

■ Applications

- (1) CD-R drives
- (2) CD-RW drives

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(T_C=25°C)

Parameter	Symbol	Rating	Unit
^{※1} Optical power output	P _{HC}	76	mW
^{※2} Optical power output (pulse)	P _{HP}	108	mW
Reverse voltage	V _R	2	V
OPIC supply voltage	V _{CC}	8	V
Operating temperature	T _{opr}	0 to +60	°C
Storage temperature	T _{stg}	-40 to +85	°C
Soldering temperature	T _{sold}	260	°C

- ^{※1} Output power from hologram laser Equivalent to 85mW (CW) from cap glass
^{※2} Output power from hologram laser Equivalent to 120mW (pulse) from cap glass
^{※3} Case temperature ^{※4} At the position of 1.6mm from the lead base (Within 5s)

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 Internet Internet address for Electronic Components Group <http://sharp-world.com/ecg/>

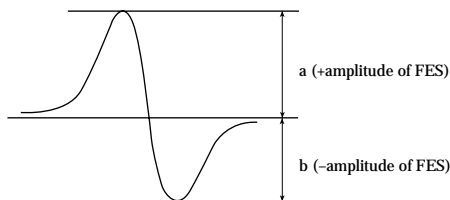
■ Electro-optical Characteristics

(T_c=25°C)

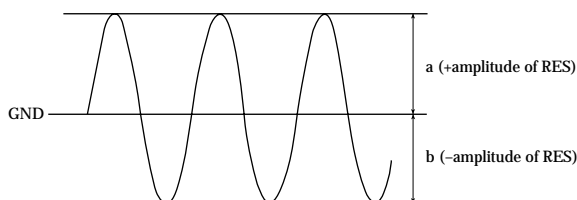
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
#1 Focal offset	DEF	Collimated lens output power 1.5mW, High gain	-0.7	-	+0.7	μm
#2 Focal error symmetry	B _{FES}	Collimated lens output power 1.5mW, High gain	-25	-	+25	%
#3 Radial error balance	B _{RES}	Collimated lens output power 1.5mW, High gain	-25	-	+25	%
#4 RF output amplitude	V _{RFH}	Collimated lens output power 1.5mW, High gain	0.61	0.90	1.06	V
#5 FES output amplitude	V _{FES}	Collimated lens output power 1.5mW, High gain	0.34	0.57	0.90	V
#6 RES output amplitude	V _{RES}	Collimated lens output power 1.5mW, High gain	0.09	0.18	0.29	V
#7 Main spot balance	MSB	Collimated lens output power 1.5mW, High gain	0.8	1.0	1.2	-
#8 Sub spot balance	SSB	Collimated lens output power 1.5mW, High gain	0.8	1.0	1.2	-
Jitter	JIT	Collimated lens output power 1.5mW, High gain	-	-	23	ns
Threshold current	I _{th}	-	-	30	40	mA
Operating current	I _{op}	P _o =85mW	-	127	155	mA
Operating voltage	V _{op}	P _o =85mW	-	2.1	2.65	V
Wavelength	λ _p	P _o =85mW	773	785	797	nm
Differential efficiency	η _d	$\frac{75\text{mW}}{I(85\text{mW})-I(10\text{mW})}$	0.55	0.9	1.2	mW/mA

#1 Distance between FES=0 and jitter minimum point

#2 (a-b) / (a+b)



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



#4 Amplitude of V_A+V_B+V_C+V_D (focal servo ON, radial servo ON)

#5 V_A-V_B (Focal vibration)

#6 Amplitude of (V_C-V_D)-k₁(V_{E+G}-V_{F+H}). k₁=(V_C+V_D)/(V_{E+G}+V_{F+H})=1
When tracking servo is ON, (V_C-V_D)-k₁(V_{E+G}-V_{F+H})+α should be 0.

#7 (V_A+V_B) / (V_C+V_D)

#8 V_C/V_D

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

(T_c=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Half intensity angle	Parallel	$\theta//$	P _o =85mW	8	9	12	°	
	Perpendicular	$\theta\perp$		17.1	21	25.5	°	
Emission characteristics	Deviation angle	Parallel		$\theta//$	-2	-	+2	°
		Perpendicular		$\theta\perp$	-3	-	+3	°
Beam shift		$\Delta\theta//$	$\theta//(85mW)-\theta//(3mW)$	-1	-	+1	°	
Kink	K-LI1		P _o =10 to 120mW	0.988	-	-	-	
	K-LI2		P1=24mW, P2=72mW, P3=120mW	-	-	15	%	

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

(T_c=25°C, V_{CC}=5V, V_{ref}=2.1V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	^⑨ Segment
Supply voltage	V _{CC}		4.5	5	5.5	V	
Reference voltage	V _{ref}		2.00	2.1	2.21	V	
Supply current	I _{CC1}	High gain, Gain switching SW=H	-	20	25	mA	
	I _{CC2}	Low gain, Gain switching SW=L	-	30	35	mA	
Output terminal current	I _o	Common to high/low gain	-0.03	0.01	+0.3	mA	A, B
Reference voltage terminal current	I _{ref}	Common to high/low gain, No light	-0.5	1	+2	mA	
^⑩ Output off-set voltage	V _{od}	Common to high/low gain, No light	-25	2	+25	mV	A, B
Off-set voltage difference, Gain switching	ΔV_{od}	Common to high/low gain	-30	-	+30	mV	A, B
Output terminal voltage of temperature sensor	T _{ao}	Common to high/low gain	1.8	2.2	2.6	V	

^⑨ Applicable divisions correspond to output terminals.

A : V_A, V_B, V_C, V_D

B : V_{E+G}, V_{F+H}

^⑩ Difference from V_{ref}

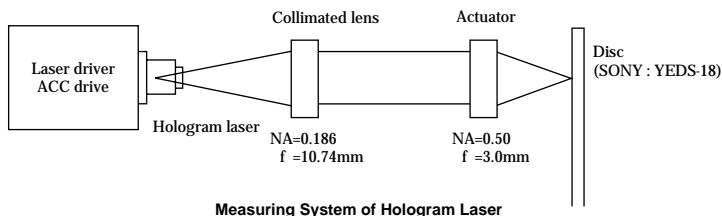
* These parameters are not guaranteed performance, but general specifications of each optical element which makes up a hologram laser.

■ Electro-optical Characteristics of Hologram Laser (Design Standard*)^{※1}

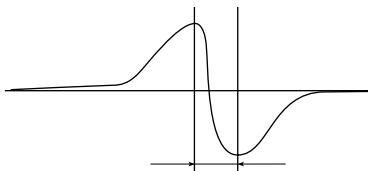
(T_c=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
※2 Focal error signal capture range	-	-	-	14	-	μm
Focal error signal sensitivity	-	-	-	20	-	%/μm

※1



※2



■ Optical Characteristics of Hologram Device (Design Standard*)

(T_c=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Hologram diffraction efficiency	0 th	$\lambda=780\text{nm}$	77	80	-	%
	±1st		7	8	10	%
Hologram diffraction angle	D1,D2	$\lambda=780\text{nm}$	-	21.1	-	°
	Except D1, D2		-	26.4	-	°
Grating diffraction efficiency	-	0:1	7.7	10	13.4	-
Grating diffraction angle	-	$\lambda=780\text{nm}$	-	2.8	-	°

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

(T_c=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Misalignment position	Δx	-	-80	-	+80	μm
	Δy		-80	-	+80	μm
	Δz		-80	-	+80	μm

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

■ Electro-optical Characteristics of OPIC for Signal Detection (Design Standard*) (T_C=25°C, V_{CC}=5V, V_{ref}=2.1V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	†3 Segment
‡4,5,6,7 Response frequency	f _{cm}	Common to high/low gain, -3dB	30	36	-	MHz	A
	f _{cs}	Common to high/low gain, -3dB	1	2	-	MHz	A
‡4,6,7 Peaking level	V _{pk2}	Common to high/low gain f=0.1 to 30MHz	-	-	3	dB	A
‡7 Noise level	f _{nm}	Hign gain, 50 Ω end BW=30MHz, f=17.3MHz	-	-74	-68	dBm	A
Sensitivity 1	R _{m1}	Main amp, Hign gain	18	24	30	mV/μW	A
Sensitivity 2	R _{m2}	Main amp, Low gain	0.72	6.96	7.1	mV/μW	A
Sensitivity 3	R _{m3}	Sub amp, Hign gain	72	96	120	mV/μW	B
Sensitivity 4	R _{m4}	Sub amp, Low gain	2.88	3.84	48	mV/μW	B

‡3 Applicable divisions correspond to output terminals.

A : V_A, V_B, V_C, V_D

B : V_{E+G}+V_{F+H}

‡4 Light source is a laser diode of λ=780nm.

‡5 -3dB level (0dB level is taken for output level when f=0.1MHz)

‡6 10μW of DC light is applied to the center of each photodiode, and 4μW of AC light is irradiated. BW=10kHz

‡7 10kΩ of resistor and 10pF of capacitor should be connected in parallel between output terminal and V_{ref} terminal.

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• Please refer to the chapter "Handling Precautions"

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- Gas leakage sensor breakers
- Alarm equipment
- Various safety devices, etc.

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