# GH5D305B3D

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

### ■ Features

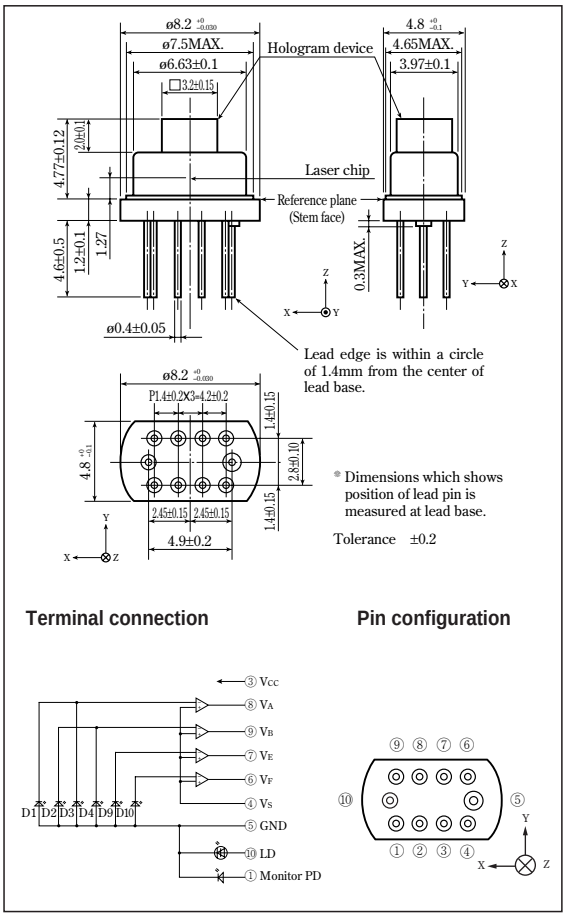
(1) With built-in OPIC※ for DVD car navigation system (Response frequency : MIN. 40MHz)
(2) Wide operating temperature for automobile use (Topr : -20 to +80˚C)
(3) 4.8mm thickness
(4) With built-in beam splitter and diffraction grating
(5) Reasonable price

### ■ Applications

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

### ■ Outline Dimensions

(Unit : mm)




### ■ 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)

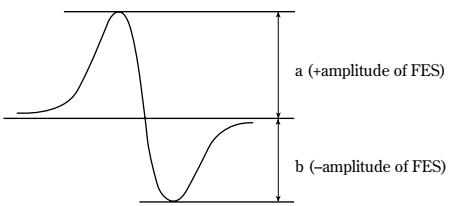
## ■ Electro-optical Characteristics

($V_{CC}$=5V, Vs=1/2 $V_{CC}$, $T_C$=25°C)

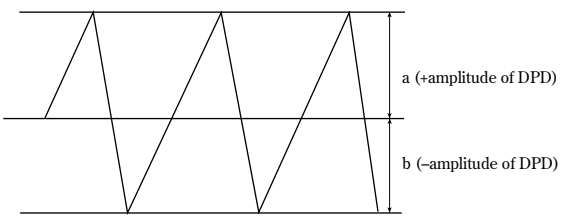
| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|
| ※1 Focal offset | DEF | $V_{RF}$=0.83V | -0.5 | - | +0.5 | µm |
| ※2 Focal error symmetry | $B_{FES}$ | $V_{RF}$=0.83V | -20 | - | +20 | % |
| ※3 Radial error balance | $B_{RES}$ | $P_H$=3.0mW | -20 | - | +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 | $\lambda_p$ | $P_H$=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 | $\eta_d$ | $\frac{1.9mW}{I(2.85mW)-I(0.95mW)}$ | 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 $\frac{a-b}{2\times(a+b)}$

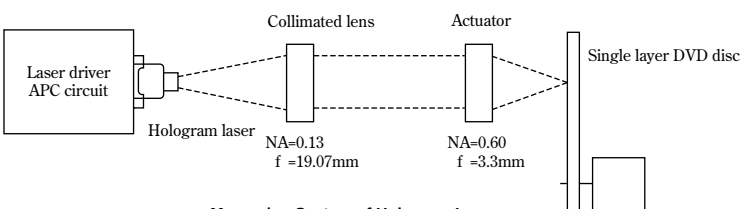



※4 RF output amplitude (focal servo ON, radial servo ON)

※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 | $\Delta V_{OD}$ | | -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"

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