

PRODUCT DATA SHEET of Fiber Optic Gyroscope HOFG-OLC

This product data sheet is applied to fiber optic gyroscope, HOFG-OLC.

1. Structure

Outline and dimensions are shown in Figure 1.

2. Characteristics

Table 1. Absolute maximum ratings.

No.	Parameter	Symbol	Min.	Max.	Units
1	Supply Voltage	V_s	10	18	V
2	Consumption Current	I_s		300	mA
3	Operating Temperature	T_o	-10	60	°C
4	Storage Temperature	T_s	-20	70	°C
5	Weight			250	g

Table 2. Characteristics (for all operating temperature range).

No.	Parameter	Typ.	Max.	Units
1	Input Range		± 120	deg/s
2	Initial Rotation Rate Bias		± 0.1	deg/s
3	Bias Stability	± 0.05	± 0.1	deg/s
4	Scale Factor Error ¹⁾	± 0.2	± 1	%
5	Non-Linearity of Scale Factor	± 0.5	± 1.5	%
6	Composite Relative Error ^{2, 3)}	± 0.5	± 1	%
7	Asymmetry of Scale Factor ²⁾ (CW versus CCW)	± 0.5	± 1	%
8	RMS Noise	0.02	0.04	deg/s
9	Bandwidth ⁴⁾	30		Hz
10	Internal integration Time		5	ms
11	Start-up Time		5	s

1) Determined as the slope deviation of the least squares straight line of input-output characteristics from unity.

2) Determined as a relative value to the input rotation rate ω for $|\omega| \geq 20$ deg/s.

3) Including the scale factor error and the non-linearity.

4) Internal integration time is 5 ms.

FOG outputs are digital data (TTL serial, see sections 3.3, 3.4, and 4.1).

3. Interface

3.1 Connector

IL-G-5S-S3C2 (Japan Aviation Electronics).

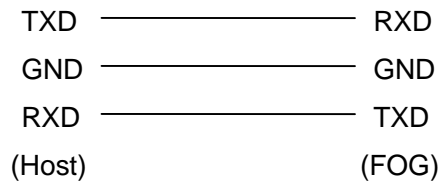
A corresponding connector is attached that is to be a pair with it.

3.2 Pin assignment

Table 3. Pin assignment.

Pin No.	Signal	Function
1	TXD	Data output
2	GND	Ground
3	RXD	Data input
4	V _s	Power supply: +12 V (from host)
5	GND	Ground

Notice) Connections of TXD, RXD and GND are as follows.



3.3 Serial I/O interface circuit

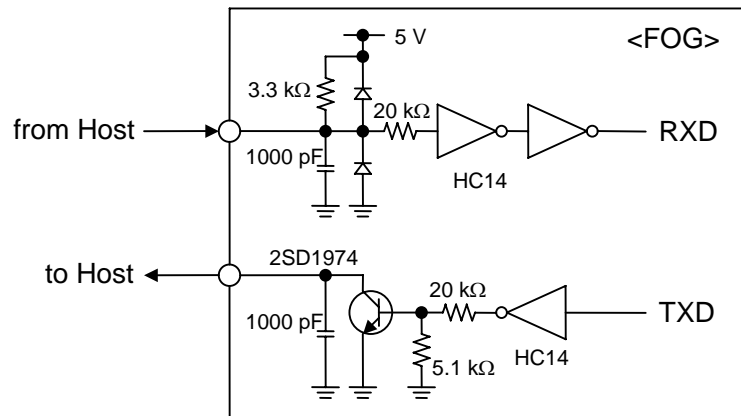


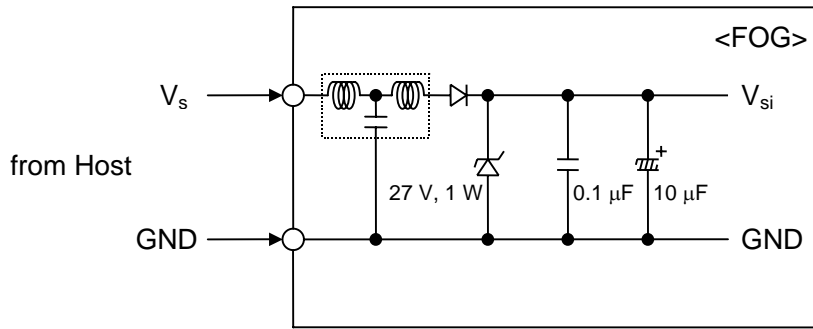
Figure 2. Interface circuit.

3.4 Signal level

Table 4. Signal level.

Parameter	Min.	Max.	Unit
Input signal (RXD)	High level	4.0	V
	Low level	1.0	V

3.5 Power supply circuit



Notice) This circuit is isolated from the case.

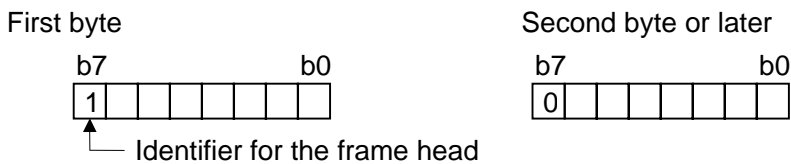
Figure 3. Power supply circuit.

4. Communication

4.1 Communication parameters

- (a) Signal level: TTL
- (b) Data rate: 19200 bps
- (c) Start bit: 1 bit
- (d) Data length: 8 bits
- (e) Parity: Odd
- (f) Stop bit: 1 bit
- (g) Idling: Logical high
- (h) Asynchronous
- (i) Full duplex

4.2 Frame format



4.3 Command

Table 5. Command.

Code	Function	Frame length
80 h	Request a rotation rate data	1 byte

Command representation:

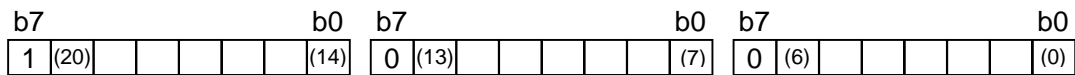
b7	b0
1	00000000

- Notice)
- FOG responds with the newest data obtained every 5 ms.
 - FOG automatically transmits data every 5 ms when it hasn't received a correct command for more than 50 ms. After receiving a correct command, it will return to respond to the command.

4.4 Response

Frame length: 3 bytes

Data: 21-bit two's complement number



Normal: FOG responds with a rotation rate data represented as a 21-bit two's complement number ranging the LSB of which corresponds to $2^{-12} = 1/4096$ deg/s. The range of rotation rates is -120 deg/s to $+120$ deg/s where CCW rotation is positive.

Table 6. Examples of the rate data.

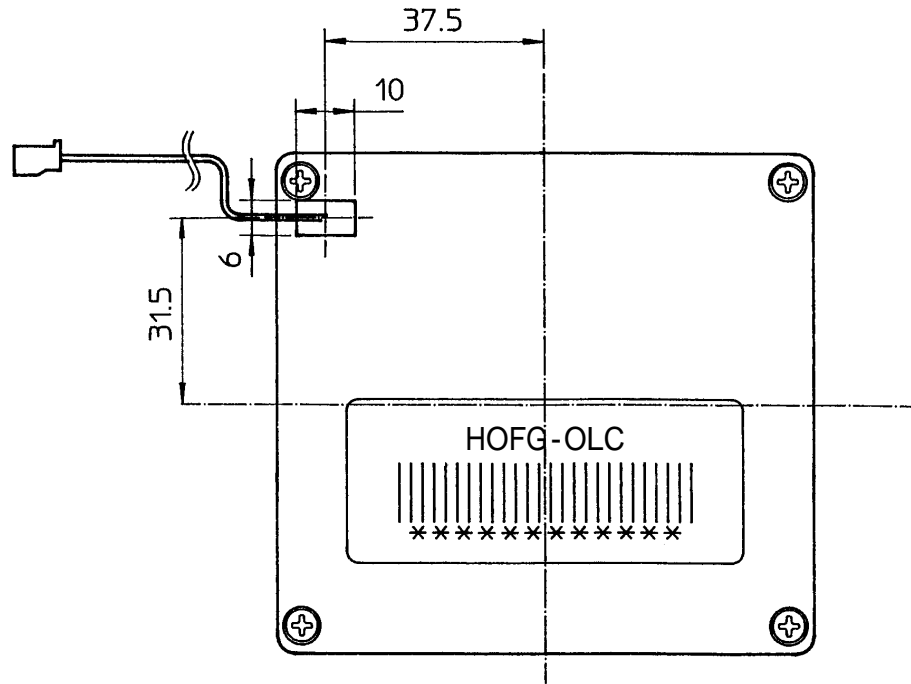
Rotation Rate (deg/s)	21-bit two's complement number							Response data		
+120	0	0111	1000	0000	0000	0000	10011110	00000000	00000000	
$+2^{-12}$	0	0000	0000	0000	0000	0001	10000000	00000000	00000001	
0	0	0000	0000	0000	0000	0000	10000000	00000000	00000000	
-2^{-12}	1	1111	1111	1111	1111	1111	11111111	01111111	01111111	
-120	1	1000	1000	0000	0000	0000	11100010	00000000	00000000	

Error: FOG responds with the data shown in Table 7.

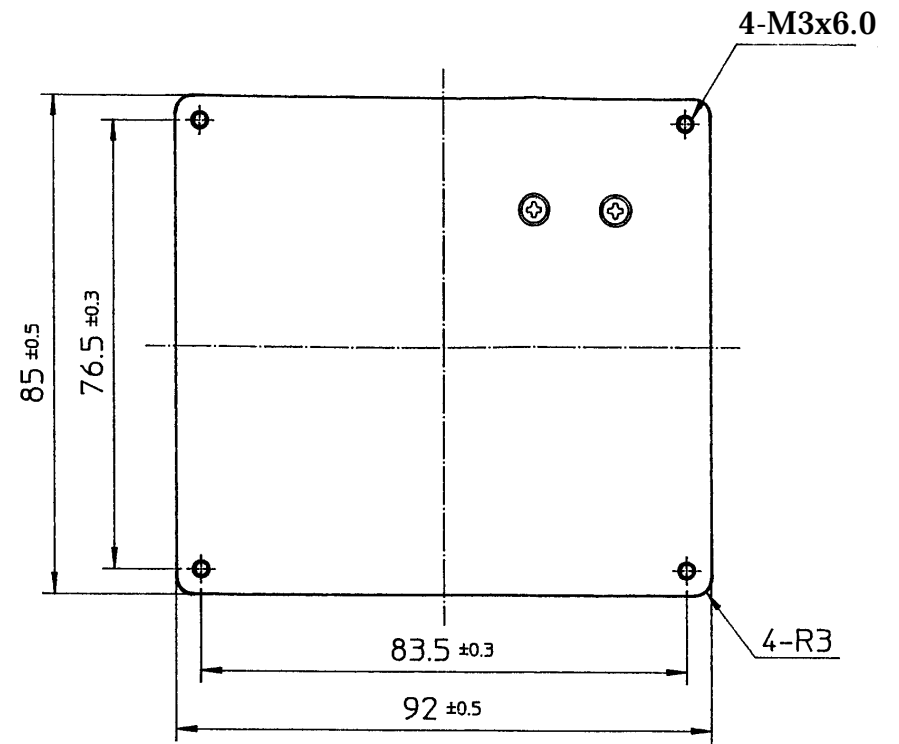
Table 7. Status codes.

Status	21-bit two's complement number							Response data		
Initializing	1	0000	0000	0000	0000	0000	11000000	00000000	00000000	
Hardware error during initialization	1	0000	0000	0000	0000	0001	11000000	00000000	00000001	
Hardware error during operation	0	1111	1111	1111	1111	1111	10111111	01111111	01111111	

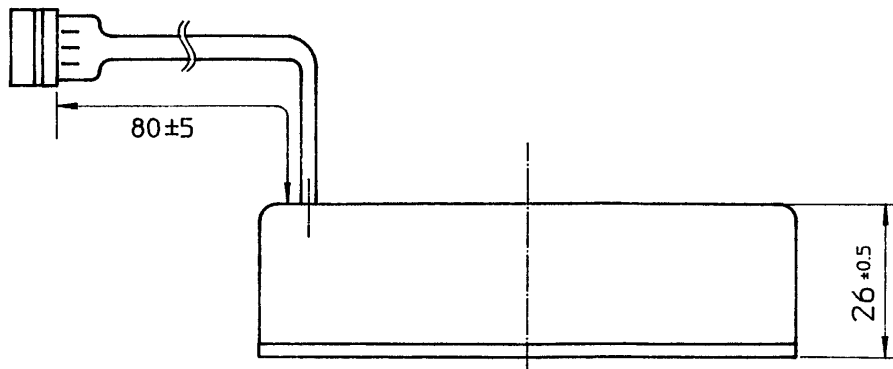
-5/5-



IL-G-5S-S3C2



(Bottom)



Note
4-M3 Max.Torque : 0.5N·m

Figure 1. Outline and dimensions of HOFG-OLC