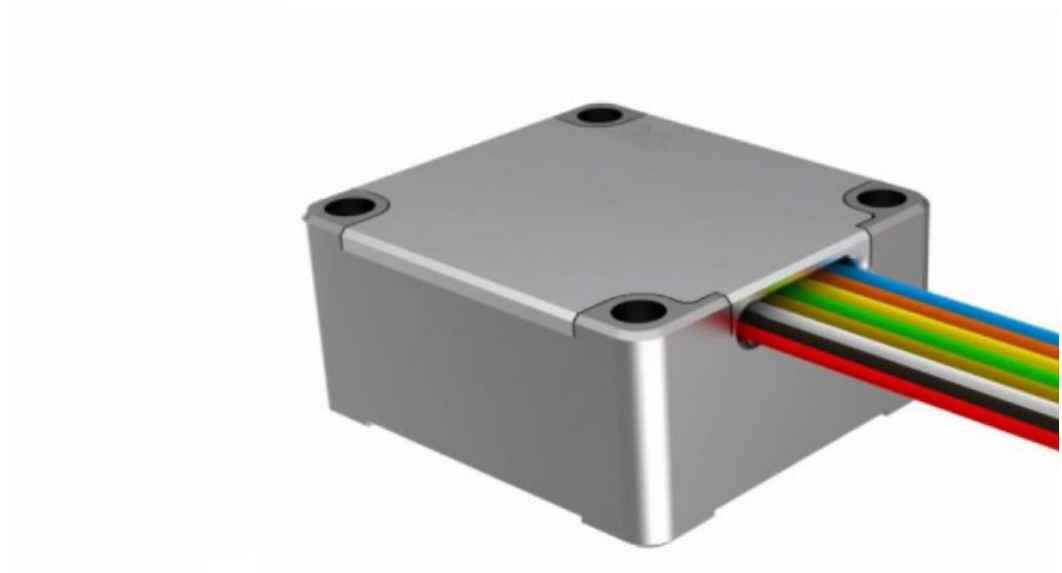





# MEMS 3-Axis Gyroscope V 1.00

## BS-GU200-5-D3EW



### Product characteristics

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-  Gyroscope measuring range: 500 ~ 2000 °/s optional
-  2 °/H gyroscope bias stability (Allan variance)
-  3-axis measurement

### Field of application

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UAV Navigation



Vehicle & Robot Navigation



AUV & ROV



## 1. Product overview

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BS-GU200-5-D3EW is a three-axis gyroscope based on MEMS technology, which has built-in high-performance MEMS gyroscope and outputs three angular velocities. The utility model has the advantages of high reliability and strong environmental adaptability. By matching different software, the product can be widely used in seeker, tactical and industrial UAV, intelligent ammunition and other fields.

## 2. Product features

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### Three-axis digital gyroscope:

A)  $\pm 500^\circ/\text{s}$  dynamic measuring range;

B) bias stability:  $8^\circ/\text{H}$  (GJB, 10s),  $1.9^\circ/\text{H}$  (ALLAN);

C) and high reliability: MTBF > 20000h;

The accuracy of the D) is guaranteed within the full temperature range ( $-40^\circ\text{C} \sim 80^\circ\text{C}$ ): built-in high-performance temperature calibration and compensation algorithm;

The E) is suitable for working under strong vibration conditions;

F) interface 1-channel RS422

## 3. Product indicators

Parameter		Test conditions	Typical value	Unit	
Angular velocity	Range	Turntable	500	$^\circ/\text{s}$	
	Peak-to-peak value	Static test	0.15	$^\circ/\text{s}$	
	Zero bias	Stability	10 s average, $+70^\circ\text{C}$ , $+20^\circ\text{C}$ , $-40^\circ\text{C}$	8	$^\circ/\text{h}$
			Allan variance, $+20^\circ\text{C}$	1.9	$^\circ/\text{h}$
		Start repeatability	$+70^\circ\text{C}$ 、 $+20^\circ\text{C}$ 、 $-40^\circ\text{C}$	15	$^\circ/\text{h}$
		Zero-bias total temperature variation	$-40^\circ\text{C} \sim +70^\circ\text{C}$ , $1^\circ\text{C}/\text{min}$ , 10 s average, $1\sigma$	0.02	$^\circ/\text{s}$
		Zero bias	Life-cycle change, accelerated testing	0.1	$^\circ/\text{s}$
	Scale factor	Repeatability of successive starts	$+70^\circ\text{C}$ 、 $+20^\circ\text{C}$ 、 $-40^\circ\text{C}$	100	ppm
Daily start repeatability		$+70^\circ\text{C}$ 、 $+20^\circ\text{C}$ 、 $-40^\circ\text{C}$	200	ppm	

Parameter		Test conditions	Typical value	Unit	
	Monthly Start Repeatability	+70°C、+20°C、-40°C	400	ppm	
	Non-linearity	+20°C	200	ppm	
	Full temperature change	1°C/min、1σ	400	ppm	
	Scale factor	Life-cycle change, accelerated testing	2000	ppm	
	Acceleration sensitive term			5	°/h/g
	Random walk			0.12	°/√hr
	Noise density			0.002	°/s/√Hz
	Bandwidth		3dB	200	Hz
	Data delay		Excluding transmission time	5ms	ms
	Start time		Time from power-on to output valid data	500	ms
Reset time	Time from reset to output valid data (hard reset)		500	ms	
	Time from reset to output valid data (soft reset)		300	ms	
The degree of nonorthogonality between any two ax		+70°C、+20°C、-40°C	0.05	°	
Power supply			5±0.1	V	
Power consumption			0.8	W	
Communication update rate		1-way RS422	200 (default) 2000 (Max)	Hz	
Communication baud rate		1-way RS422	230.4 (default) 921.6 (Max.)	kbps	

#### 4. Electrical interface

Color	Name	Type	Description
Red	5V	Power source	

Black	GND	Power source	RS422, 230400 bps by default
White	R+	Input	
Brown	R-	Input	
Green	T-	Output	
Yellow	T+	Output	
Orange	Spare		
Blue	Spare		

## 5. Fabric interface

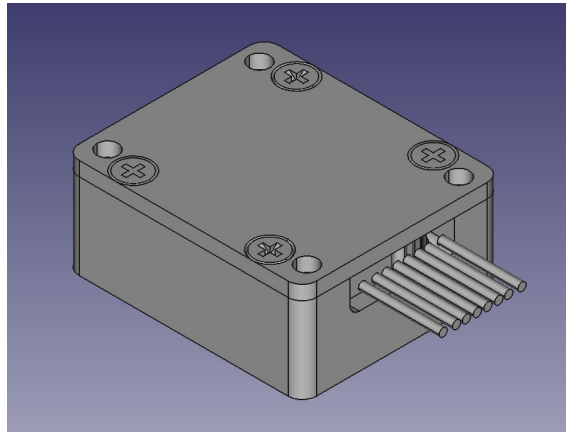


Fig. 1 Schematic diagram of structure outline

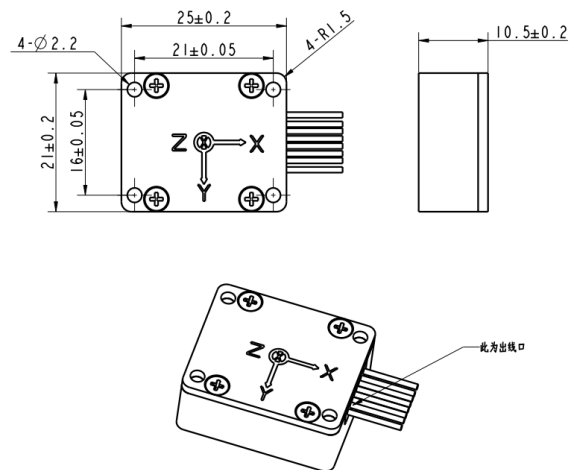


Fig. 2 Schematic Diagram of Structure Appearance

## 6. Instructions for use

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### 6.1 UART read-write data

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#### 6.1.1 interface

Default configuration: 460800bps, 8 data bits, 1stop bit, no parity;

#### 6.1.2 configuration commands

- 1) \$GPENB  
Enable UART power-on automatic output
- 2) \$GPDIS  
Close UART power-on automatic output
- 3) \$GPSER  
View the serial number
- 4) \$GPINF  
View configuration information

#### 6.1.3 protocol format

It is divided into protocol head, protocol body and protocol tail; 200 Hz; the coordinate axis is defined as the lower right front.

	Byte	Data	Unit	Data type	Remark
Protocol header	0	0x5a			
	1	0x5a			
Protocol body	2~5	X-axis	°/s	float	
	6~9	Y-axis	°/s	float	
	10~13	Z-axis	°/s	float	
	14~17	Spare			
	18~21	Spare			
	22~25	Spare			
	26~29	Spare			
	30~33	Spare			
	34~37	Spare			
38~41	Spare				

	42~45	Spare			
	46~49		°C	float	
	50~53	Spare			
	54~57	Spare			
End of agreem	58	Checksum			Accumulate and sum 2 to 57 bytes, take the low