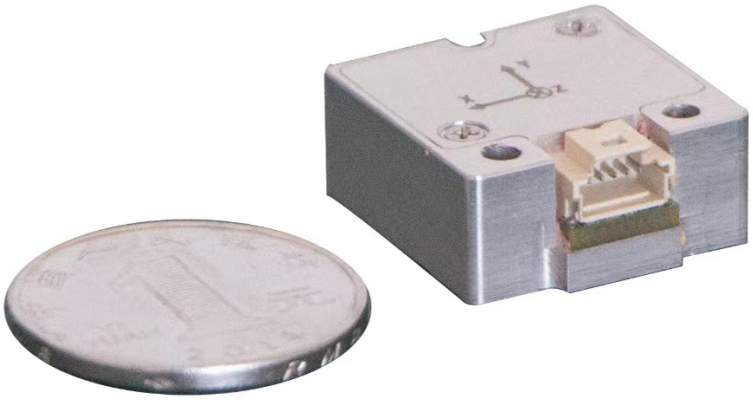
MEMS Inertial Measurement Unit V 1.51.

BS-IC204-M-D6EC



Product characteristics

- Gyroscope measuring range: 500 °/s optional
- 2 °/H gyroscope bias stability (Allan variance)
- Acceleration range: 16g
- Zero bias stability (Allan variance) for acceleration of 0.1 mg

Field of application

UAV Navigation Robot Navigation AUV Navigation

Various air carriers flight navigation land vehicle navigation ROV navigation

1. Product overview

The BS-IC204-M-D6EC is an inertial measurement unit (IMU) based on micromachining technology (MEMS) with built-in high-performance MEMS gyroscope and MEMS accelerometer, which outputs 3 angular velocities and 3 accelerations. The utility model has the advantages of high reliability and strong environmental adaptability. By matching different software, the product can be widely used in intelligent driving, tactical and industrial UAV, intelligent ammunition, seeker and other fields.

2. Product features

1) Three-axis digital gyroscope:

A) ± 500°/s dynamic measuring range;

B) Zero bias stability: 10 °/H (GJB, 10s), 2.0 °/H (ALLAN);

2) Triaxial digital accelerometer:

A) ± 16 G dynamic measuring range;

B) Zero-bias stability: 0.5 mg (GJB, 10s), 0.1 mg (ALLAN);

3) High reliability: MTBF > 20000h;

4) Guaranteed accuracy within the full temperature range (-40 ℃ ~ 80 ℃): built-in high-performance temperature calibration and compensation algorithm;

5) Suitable for working under strong vibration conditions

6) Interface 1-way UART

3. Product indicators

Parameter name		Test conditions	Typical value	Unit
Dynamic measuring range			500	°/s
Zero bias stability		Allan variance 10 s average (-40 ℃ ~ + 80 ℃, constant temperature)	2.0 10	°/h °/h
Peg-top	Zero bias	Zero bias range Zero bias change over full temperature range ○ 1	±0.1 ±0.05	°/s °/s
	Scale factor	Scale factor accuracy Scale factor nonlinearity	0.2 0.01	% %FS
	Bandwidth		200	Hz
Accelerometer	Dynamic measuring		16	g

	range			
	Zero bias stability	Allan variance 10 s average (-40 ℃ ~ + 80 ℃, constant temperature)	0.1 0.5	mg mg
	Zero bias	Zero bias range Zero bias change over full temperature range ○ 1	5 1	mg mg
	Scale factor	Scale factor accuracy Scale factor nonlinearity	0.3 0.02	% %FS
	Bandwidth		200	Hz
Communication interface	UART	Baud rate	230.4	Kbps
		Sampling frequency	200 1000	Hz
Electrical characteristics	Voltage		4.5 5.0 5.5	V

Parameter		Test conditions	Minimum value	Typical value	Maximum value	Unit
Power consumption					0.5	W
Ripple		P-p			100	mV
Structural characteristics	Size			22.4×24×9		mm
	Weight			10		g
Use environment	Operating temperature		-40		80	℃
	Storage temperature		-45		85	℃
	Vibration			20~2000Hz，6.06g		
	Impact			1000g，0.5ms		
Reliability	MTBF Continuous working time			20000 120		h h

①: calculating the zero deviation of the whole temperature change process,

wherein the temperature change rate is less than or equal to 1 deg C/min, and the temperature range is -40 deg C to + 80 deg C;

4. Electrical interface

The standard version of BS-IC204-M-D6EC uses 6PIN domestic connectors with locking function for interconnection. The schematic diagram of interface definition, pin definition and specific functions are shown in the following table.

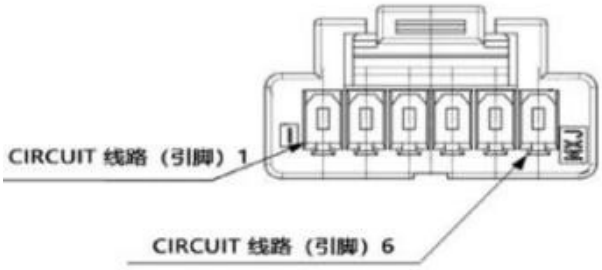
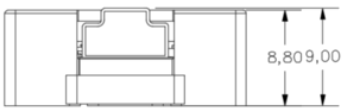


Figure 1 Schematic diagram of electrical interface

Serial	Name	Functional description	IO	Line
1	+5V	Power input + 5V ± 0.5V, peak current ≤ 100mA,	Input	Red
2	GND	Power ground	Ground	Black
3	UART-TX	Communication serial port output, LVTTL 3.3	Output	Green
4	UART-RX	Communication serial port input, LVTTL 3.3	Input	White
5	SYNC	Effective pulse width of synchronous signal output rising	Output	Purple
6	MCLR	Reserved	Input	Blue

5. Fabric interface



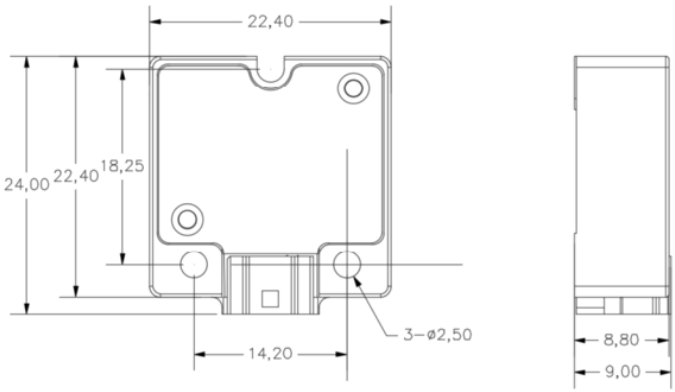


Fig. 2 Schematic Diagram of Structure Appearance

6. Instructions for use

6.1 UART read-write data

6.1.1 interface

Default configuration: 230400bps, 8 data bits, 1stop bit, no parity;

6.1.2 protocol format

A protocol head, a protocol body and a protocol tail; 200Hz; The coordinate axis is defined as front top right.

Agree	Byte	Data	Unit	Data	Remark
Protocol	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	X-axis	g	float	
	18~21	Y-axis	g	float	
	22~25	Z-axis	g	float	
	26~29	X-axis	mgauss	float	
	30~33	Y-axis	mgauss	float	
	34~37	Z-axis	mgauss	float	
	38~41	Spare			
	42~45	Spare			
	46~49	Temperat	℃	float	
	50~53	Spare			
	54~57	Spare			

End of agree	58	Checksum			Accumulate and sum 2 to 57 bytes, take the low

7. Update the record

Serial number	Version	Change the date	Before the change	After the change	Reason for the change	Changed by
1	1.00	20220908		New establishment	New establishment	Zzy
2	1.5	20230606			Change the cable	Asl
3	1.51	20230620			SYNC, MCLR pin definition	Sdm