

BS-IW61-TTL

Datasheet

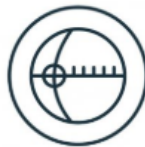
AHRS IMU | BS-IW61-TTL *Acceleration, Angular velocity & Angle Detector*

The BS-IW61-TTL is an inertial measurement unit (IMU), detecting acceleration, angular velocity as well as angle. The small size makes it suitable for various applications such as condition monitoring and predictive maintenance.

BUILT-IN SENSORS



Accelerometer



Gyroscope

Application

- AGV Truck
- Platform Stability
- Auto Safety System
- 3D Virtual Reality
- Industrial Control
- Robot
- Car Navigation
- UAV
- Truck-mounted Satellite Antenna Equipment

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1 Overview

BS-IW61-TTL is AHRS IMU sensor. A sensor measures 3-axis angle, angular velocity, acceleration.

BS-IW61-TTL is employed where the highest measurement accuracy is required.

- High precision Roll Pitch Yaw (X Y Z axis) Acceleration + Angular Velocity + Angle output

2 Features

- The default baud rate of this device is 115200 and could be changed as 9600.
- The interface of this product only leads to a serial port
- The module consists of a high precision gyroscope, accelerometer sensor. The product can solve the current real-time motion posture of the module quickly by using the high-performance microprocessor, advanced dynamic solutions and Kalman filter algorithm.
- The advanced digital filtering technology of this product can effectively reduce the measurement noise and improve the measurement accuracy.
- Maximum 100Hz data output rate. Output content can be arbitrarily selected, the output speed 20Hz or 100HZ adjustable.

3 Specification

3.1 Accelerometer parameters

Parameter	Condition	Typical
Range		$\pm 16g$
Resolution	$\pm 16g$	0.0005(g/LSB)
RMS noise	Bandwidth = 100Hz	0.75~1mg-rms
Static zero drift	Placed horizontally	$\pm 20\sim 40mg$
Temperature drift	$-40^{\circ}C \sim +85^{\circ}C$	$\pm 0.15mg/^{\circ}C$
Bandwidth		5~256Hz

3.2 Gyroscope parameters

Parameter	Condition	Typical
Range		$\pm 2000^{\circ}/s$
Resolution	$\pm 2000^{\circ}/s$	0.061($^{\circ}/s$)/(LSB)
RMS noise	Bandwidth = 100Hz	0.028~0.07($^{\circ}/s$)-rms
Static zero drift	Placed horizontally	$\pm 0.5\sim 1^{\circ}/s$
Temperature drift	$-40^{\circ}C \sim +85^{\circ}C$	$\pm 0.005\sim 0.015 (^{\circ}/s)/^{\circ}C$
Bandwidth		5~256Hz

3.3 Pitch and roll angle parameters

Parameter	Condition	Typical
Range		X:±180°
		Y:±90°
Inclination accuracy		0.2°
Resolution	Placed horizontally	0.0055°
Temperature drift	-40°C ~ +85°C	±0.5~1°

3.4 Heading angle parameter

Parameter	Condition	Typical
Range		Z:±180°
Heading accuracy	6-axis algorithm, static	0.5°(there is an integral cumulative error in dynamic) 【1】
Resolution	placed horizontally	0.0055°

Note:

【1】 In some vibration environments, there will be cumulative errors, and the specific errors cannot be estimated. The actual test shall prevail.

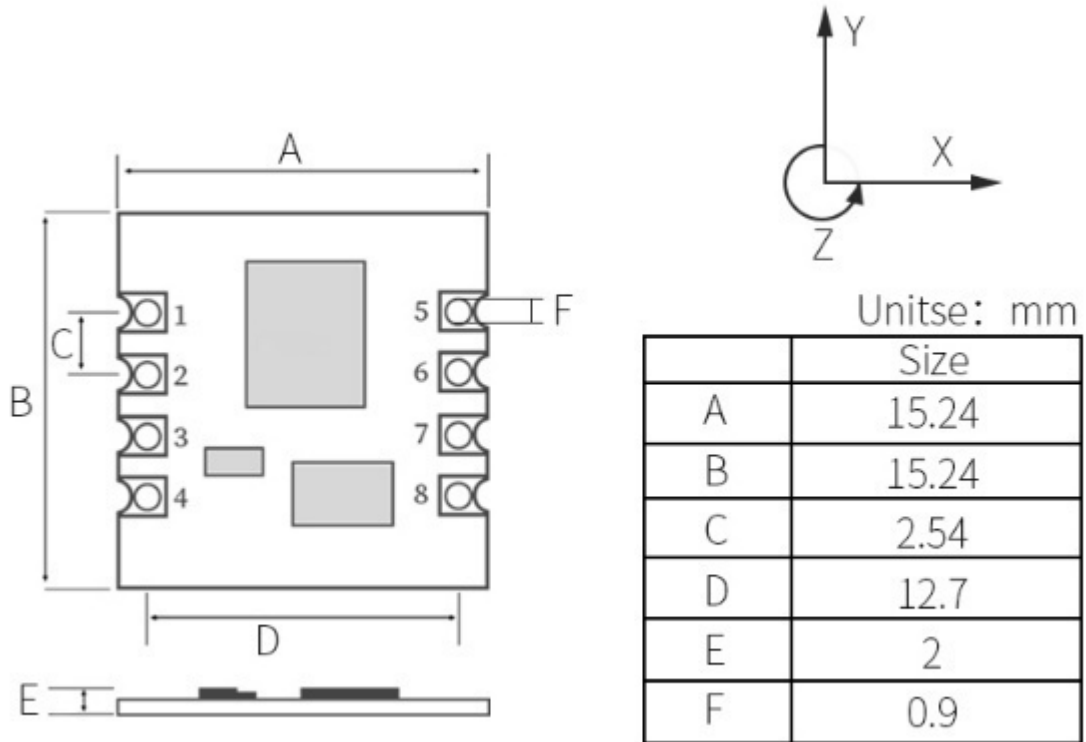
3.5 Module parameters

parameter	Condition	Minimum	Default	Maximum
Communication Interface	TTL	9600bps	115200bps	115200bps
Output content		acceleration, angular velocity, angle		
Output rate		20Hz	100Hz	100Hz
Transmission distance	TTL			1m
	IIC			10m
Start Time				1000ms
Operating temperature		-40°C		85°C
Storage temperature		-40°C		100°C
Shock proof				20000g

3.6 Electrical parameters

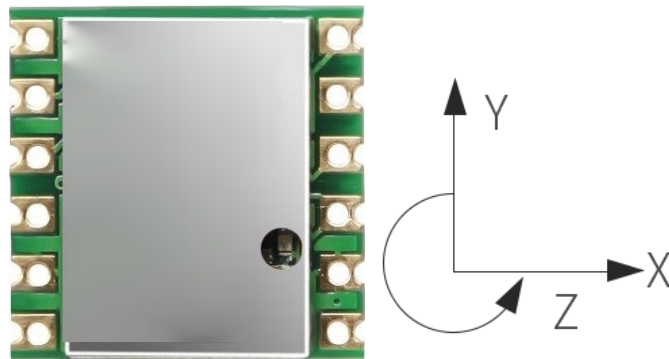
Parameter	Condition	Minimum	Default	Maximum
Supply voltage		3.3V	5V	5.5V
Working current	Work (5V)		9mA	
	Sleep (5V)		15uA	

3.7 Size

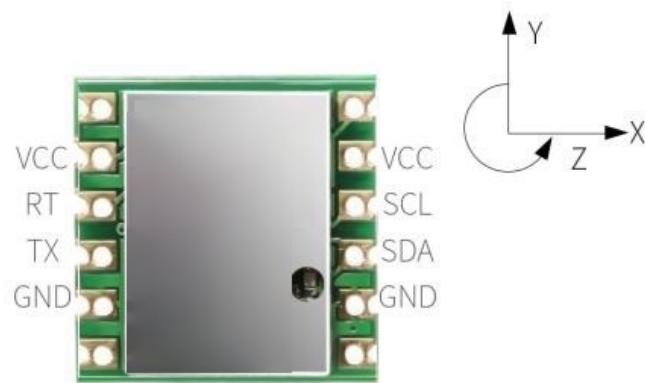


3.8 Axial Direction

The coordinate system used for attitude angle settlement is the northeast sky coordinate system. Place the module in the positive direction, as shown in the figure below, direction right is the X-axis, the direction forward is the Y-axis, and direction upward is the Z-axis. Euler angle represents the rotation order of the coordinate system when the attitude is defined as Z-Y-X, that is, first turn around the Z-axis, then turn around the Y-axis, and then turn around the X-axis.



4 Pin Definition



PIN	Function
➤ VCC	3.3-5V input supply
➤ RX	Serial data input, TTL interface
➤ TX	Serial data output, TTL interface
➤ GND	Ground
➤ VCC	3.3-5V input supply
➤ SCL	I2C clock line
➤ SDA	I2C signal line
➤ GND	Ground

5 Communication Protocol

Level: TTL level

Band rate: 9600 , 115200(default), Stop bit 1, check digit 0.