

JS-BNK43H-2

Multi-Constellation Multi-Frequency RTK Board

Data Sheet

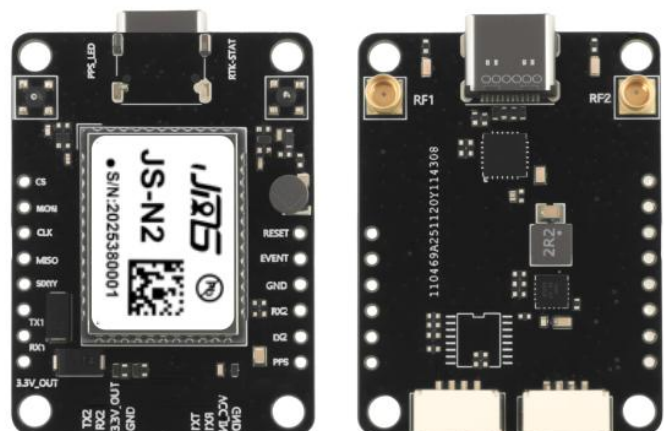


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Version update records

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1. Function Description

1.1 Overview

The JS-BNK43H-2 is a multi-frequency, multi-constellation GNSS board that supports full-system, full-frequency on-chip positioning and multi-system joint positioning, and can be used as a mobile station or base station . In dual-antenna mode, it not only improves positioning accuracy but also determines the heading, reducing the impact of signal blockage . The JS-BNK43H-2 features a built-in 2GHz dual-core CPU with 1408 super channels, providing more powerful satellite navigation signal processing capabilities. The JS-BNK43H-2 can be applied in various fields such as drones , lawnmowers , precision agriculture , autonomous driving , and intelligent driver testing . Its built-in advanced anti-interference technology ensures reliable and accurate positioning accuracy even in complex electromagnetic environments .

1.2 Product Characteristics

- Use high-performance chips
- Dual antenna input
- Supports multi- frequency on-chip positioning across the entire system.
- Up to 20Hz navigation update rate
- Dual-RTK engine technology
- Compact size (39.00mm * 30.00mm * 6.04mm ± 0.2 mm) and lightweight (<25g) , suitable for compact spaces .
- Can be used as a mobile station or base station
- Up to 1408 super channels
- Supports interfaces such as PPS and EVENT.
- Supports the standard NMEA 0183 protocol, differential input RTCM 3.X format adaptive recognition.

1.3 Performance Indicators

Parameter	Detailed Explanation			
Satellite Receiving	Main antenna frequency ■BDS:B1I, B2I, B3I ■GPS: L1C/A, L2P(Y)/L2C, L5 ■GLONASS: L1 , L2 ■Galileo:E1, E5a, E5b ■QZSS:L1 L2, L5		Salve antenna frequency ■BDS:B1I, B2I, B3I ■GPS: L1C/A, L2C ■GLONASS: L1 , L2 ■Galileo:E1, E5b ■QZSS:L1 , L2	
Observation accuracy (RMS)	BDS	GPS	GLONASS	Galileo
B1I L1C/A G1 E1 pseudorange	10cm	10cm	10cm	10cm
B1I L1C/A G1 E1 carrier phase	1mm	1mm	1mm	1mm
B3I L2P(Y) L2C G2 pseudorange	10cm	10cm	10cm	10cm
B3I L2P(Y) L2C G2 carrier phase	1mm	1mm	1mm	1mm
B2I L5 E5a E5b pseudorange	10cm	10cm	10cm	10cm
B2I L5 E5a E5b carrier phase	1mm	1mm	1mm	1mm
Positioning accuracy	Single point positioning ¹ (RMS) Horizontal positioning accuracy: 1.5 m Vertical accuracy 2.5m DGPS ^{1,2} (RMS) Horizontal positioning accuracy 0.4 m ± 1 ppm Vertical accuracy 0.8m ± 1ppm RTK ^{1,2} (RMS) Horizontal positioning accuracy 0.8 cm ± 1 ppm Vertical accuracy 1.5cm ± 1ppm			
Initialization time ¹	< 5 s (typical value)			

Initial reliability ¹	>99.9%
Time accuracy (RMS)	20ns
Velocity accuracy (RMS) ³	0.03m/s
Heading accuracy (RMS)	0.2°@1m Base Line
First positioning time ⁴	Cold start <30 s
Baud rate	9600~921600bps (default 115200)
Maximum data update rate	Positioning and Heading 20 Hz Original observations 20 Hz

✎1. Measurement results are affected by atmospheric conditions, baseline length, GNSS antenna type, multipath propagation, number of visible satellites, and satellite geometry, and may have deviations.

✎2. Measurements were performed using a 1-kilometer baseline and a high-performance antenna board , without considering possible antenna phase center offset errors.

✎3. Open sky, unobstructed view, 99% static

✎4 -130dBm @ More than 12 available satellites

1.4 Agreement Description

Protocol	Type
Data format	NMEA-0183, Unicore
Differential data	RTCM 3.X

1.5 Antenna

The JS-BNK43H-2 is a dual-antenna version of the board , requiring both a main antenna and an slave antenna for use. The main antenna must be connected to the positioning connector marked RF1 on the board , and the slave antenna must be connected to the heading connector marked RF2 . In single-antenna mode, the JS-BNK43H-2 only requires connecting RF1 for positioning.

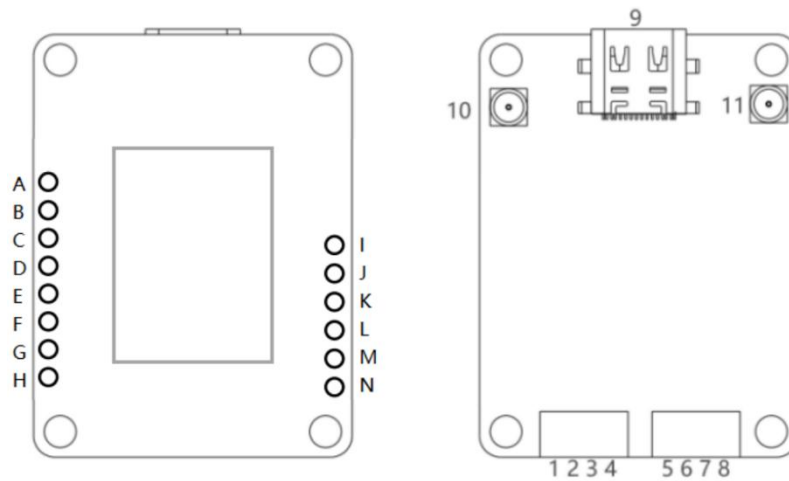
Parameter	Symbol	Minimum value	Typical value	Maximum value	Unit
Optimal input gain of antenna	Gain	18	30	36	dB

1.6 Product Application

- Drone applications
- Intelligent logistics scheduling
- Unmanned
- Precision agriculture and location services
- Driving test
- Lawn mower
- In-vehicle equipment applications
- Precision control

2. Pin Definitions

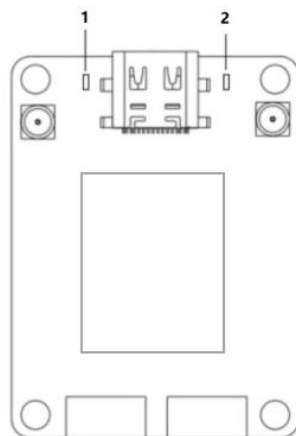
2.1 Pin assignment



S.N.	Name	Input/Output	Description
1. K	GND	-	Ground
2	V CC_IN	Input	GNSS power supply 3.5 - 12.0V, standard 5V power supply.
3. G	RX1	Input	Serial port 1 GNSS receiving data
4. F	TX1	Output	Serial port 1 GNSS data transmission
5	GND	-	Ground
6. H	3.3V_OUT	Output	3.3V can be used to power other devices.
7. L	RX2	Input	Serial port 2 GNSS receiving data
8. M	TX2	Output	Serial port 2 GNSS data transmission
9	USB	Input / Output	TYPE-C power supply + data transmission
10	RF1	Input	GNSS main antenna interface, used for positioning , power supply voltage 3.0-5.5V .

11	RF2	Input	GNSS slave antenna interface, used for heading, power supply voltage 3.0-5.5V .
A	CS	Input / Output	Film Selection
B	MOSI	Output	GNSS data transmission
C	CLK	Output	Synchronization Timing
D	MISO	Input	GNSS received data
E	SDRY	Input	Indicates slave device status, triggers master control to read.
I	RESET	Output	Reset
J	EVENT	Output	External interrupt triggered
N	PPS	Output	Second pulse

2.2 Indicator lights



S.N.	Name	Input/Output	Description
1	RTK	Output	RTK positioning indicator, active high. Outputs a high level during RTK fixed-position operation ; outputs a low level during other positioning states or when not positioning, and the LED is off. (Green LED)
2	PPS	Output	Second pulse (green LED)

3. Electrical characteristics

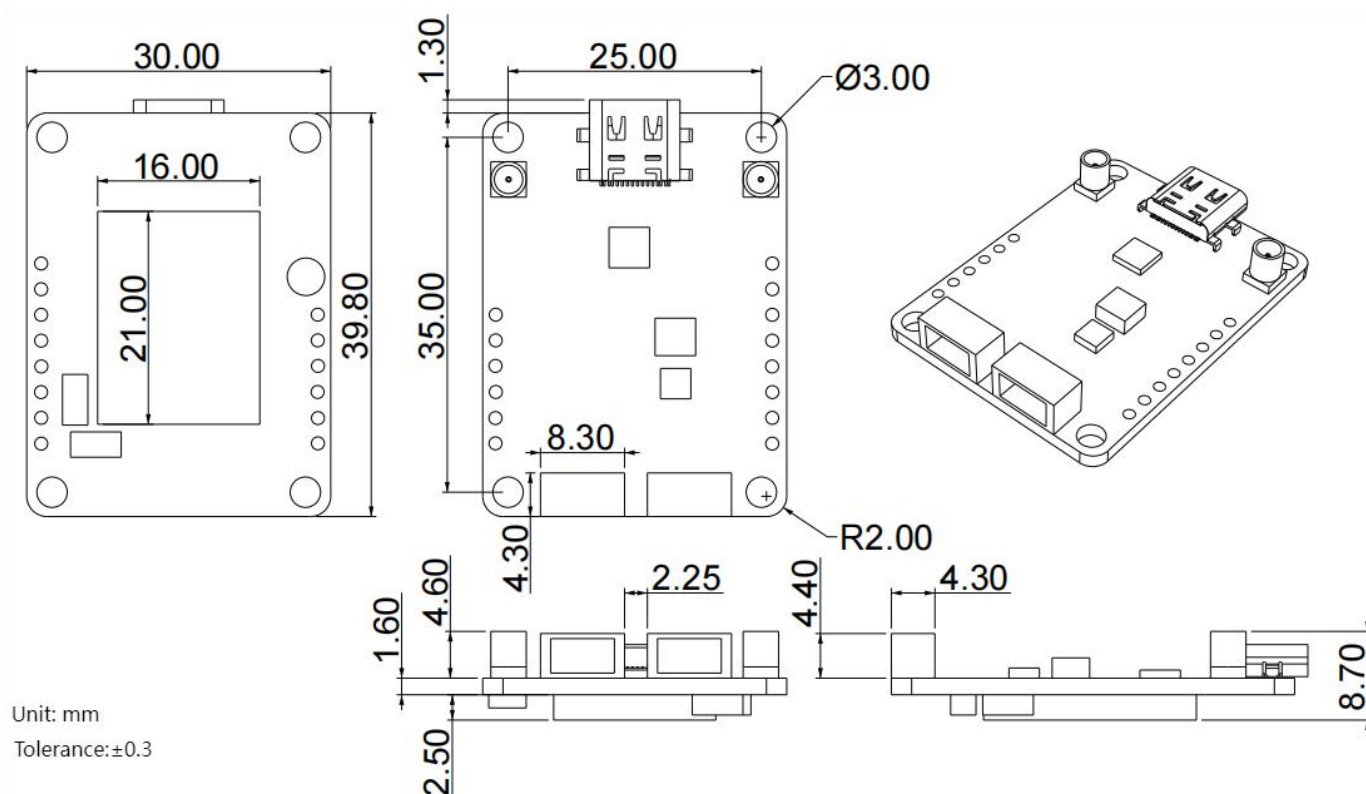
3.1 Working conditions

Parameter	Symbol	Minimum	Conventional	Maximum	Unit
Power supply voltage range	V CC	3.5	5	12	V
VCC maximum ripple	Vrpp	0	-	50	mV
Operating current	Iopr	148 @ 5V	161 @ 5 V	169 @ 5V	mA
Operating temperature	Tstg	- 40	-	85	°C
Storage temperature	Tstg	- 40	-	85	°C
Humidity	RH	-	Non-condensing	95	%rh

3.2 I/O Port Threshold Characteristics

Parameter	Symbol	Minimum	Conventional	Maximum	Unit	Condition
Input pin low level	Vin_low	0	-	VCC*0.2	V	-
Input pin high level	Vin_high	VCC*0.7	-	VCC+0.2	V	-
Output pin low level	Vout_low	0	-	0.45	V	Iout=4mA
Input pin low level	Vout_high	VCC-0.45	-	VCC	V	Iout=4mA

4. Mechanical dimensions



5. Interface Configuration Selection

The JS-BNK43H-2 board includes two UART ports and one USB interface , which can be used for communication with the host computer . The block diagram is as follows:

