



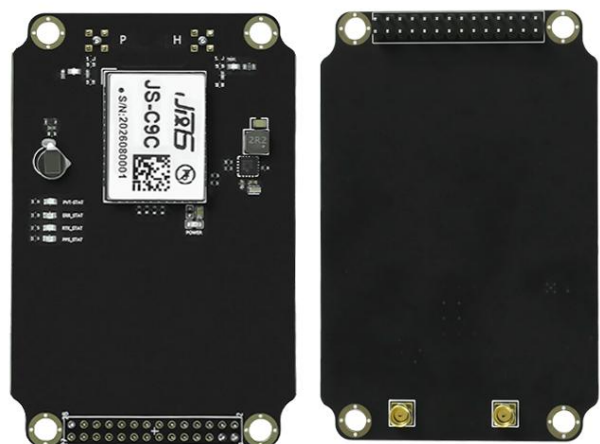
Accurate
positioning

22°43'59.57617"N 114°03'03.61546"E



JS-CK15-3

Data sheet



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Revision history

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1. Product Introduction

1.1 Overview

The JS-CK15-3 is a high-precision, multi-frequency, multi-constellation GNSS receiver . Its inertial navigation system provides powerful positioning assistance even with weak satellite signals . This device employs a dual-antenna mode , utilizing interferometry to improve the accuracy and reliability of heading measurement. The JS-CK 15-3 can smoothly track satellite signals even during high-frequency vibrations and rapid movement, and supports integrated navigation algorithms, enabling rapid positioning even in complex

environments . The JS-CK15-3 is suitable for applications such as drones, unmanned aerial vehicles , fully automated robots, precision control scenarios, and precision agriculture. .

1.2 Product Features

- Use high-performance chips
- Built-in inertial navigation and bidirectional antenna input
- Supports multi-frequency on-chip positioning across the entire system
- Supports a maximum navigation update rate of 50 Hz, with a maximum navigation update rate of 100 Hz for the IMU.
- Supports multi- frequency satellite tracking across the entire constellation
- Flexible to use and easy to integrate
- Integrated TCXO, LNA, SAW, RTC
- Lightweight and compact (71.0mm x 46.0mm x 9.6mm $\pm$ 0.5mm) , < 16.0g
- Supports standard NMEA 0183 protocol , CMR , RTCM 2.X, 3.X
- It suppresses potential narrowband and single-tone radio interference signals within the GNSS signal band, achieving a signal-to-interference ratio of up to 60 dB.
- RTK positioning accuracy can reach the millimeter level

1.3 Performance Indicators

Parameter	Description
Satellite ¹	Positioning ■GPS: L1 C/A, L2P ¹ , L2C, L5, L1C ¹ ■SBAS: L1C/A, L5 ■BDS -2 :B1I , B2I , B3I ■BDS -3 : B1I , B1C ¹ , B2a, B2b ¹ , B3I ■GLONASS: G1, G2, G3 ¹ ■QZSS:L1C/A, L 2 C, L5 , L 1 C ¹ ■Galileo:E1, E5a, E5b ,E5 ALTBoc ¹ ,E6c ¹ ■ NavalC:L5 ¹ ■ L-Band ¹

		Heading	
		■GPS: L1 C/A , L5	■Galileo:E1, E5a
		■BDS -2 :B1I , B2I	■ BDS - 3 : B2a, B1I
		■QZSS:L1C/A, L5	
Tracking performance (C/N0 threshold)		Signal tracking sensitivity	-160dBm
		Signal acquisition sensitivity	-145dBm
Positioning time		Cold start 30 s	
		Warm boot (using RTC)	10s
		Loss and Re-acquisiton	1s
Measurement accuracy		Pseudorange accuracy	10cm
		Carrier phase accuracy	1mm
Precision ³	PPS(RMS ²):	20ns	
	Timekeeping accuracy		
	SPP: Standard Single Point Positioning Accuracy	Horizontal:	1.5m
		Vertical:	3m
	Velocity accuracy	0.02m/s	
	Orientation accuracy	0.2°@1m base line	
Auxiliary dead reckoning (error)		3%d (d is the distance traveled)	
PPP	PPP convergence time	20min	
	PPP accuracy	Horizontal: 0.1m	
		Vertical: 0.2m	
RTK	RTK initialization time	5s (D<10km)	
	Initial confidence	99.9%	
	RTK accuracy	Horizontal: 8mm + 1ppm ⁴ Vertical: 15mm + 1ppm ⁴	
IMU (Inertial Measurement Unit)	gyroscope	Measurement range: ±125°/s	
		Zero-bias repeatability: 0.5°/s	
		Zero bias stability: 5°/h	
		Angle random walk: 0.12°/sqrt(h)	
	accelerometer	Measurement range: ±2g	
		Zero-biased repeatability: 20mg	
		Zero bias stability: 50ug	

	Velocity random walk: 0.07 m/s/sqrt(h)
Data update rate	Default 10Hz
Maximum update rate	Single-point positioning: 50Hz
	RTK: 50Hz
	IMU: 100Hz
Baud rate	9600~921600bps (default 115200bps)
Anti-interference	It has the ability to suppress potential narrowband and single-tone radio interference signals within the GNSS signal band, with an interference-to-signal ratio of up to 60 dB.

✌️ 1. Adjusted along with the version

✌️ 2 Open sky, unobstructed view, 99% static

✌️ 3. Test results are affected by atmospheric conditions, baseline length, multipath, number of visible satellites, and satellite geometry, and may have biases.

✌️ 4 The error is 1 centimeter per 10 kilometers.

1.4 Agreement

Output data format	Type
NMEA 0183 Protocol	GPGGA, GPGSV, GPGLL, GPGSA, GPGST, GPHTD, GPRMC, GPVTG, GPZDA etc.
Binary format	Custom binary
RTCM 2.x	RTCM 1, RTCM 3, RTCM 9, RTCM 1819, RTCM 31, RTCM 41, RTCM 42
RTCM 3.x	1004~1008, 1012, 1019, 1020, 1033, 1042, 1045/1046, 1230, 4078 MSM3~MSM7: 1073~1077, 1083~1087, 1123~1127, 1093~1097
CMR (GPS)	CMROBS, CMRRREF

1.5 Antenna

Antenna parameters	Impedance matching	Antenna gain
Optimal input gain of external antenna	50Ω	20~35dB

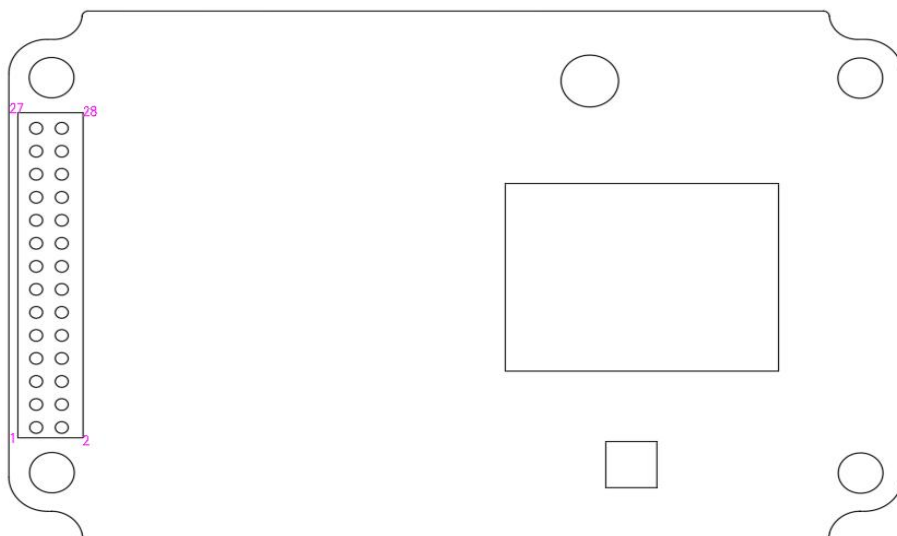
1.6 Application Areas

- Drones
- Precision agriculture
- Automotive Applications
- Maritime Navigation

- Intelligent driving test
- Surveying and mapping
- intelligent robots
- Smart Port
- Power grid
- Smart Transportation

2 -pin definition

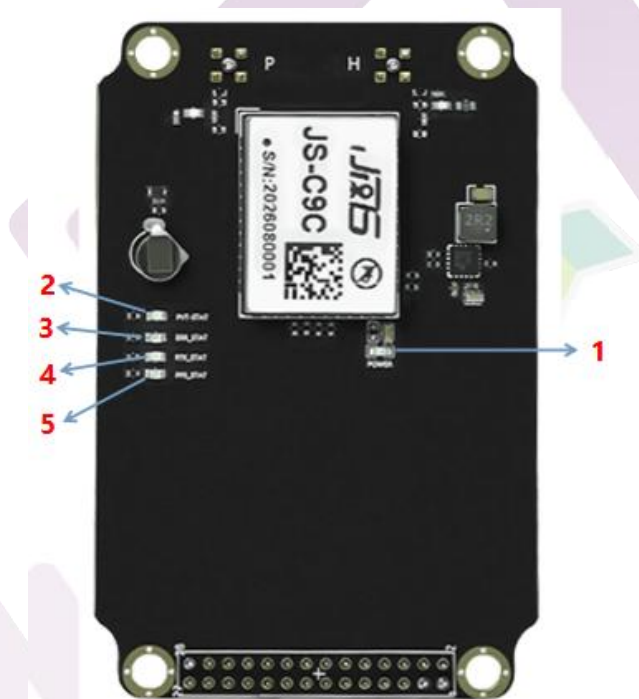
2.1 Pin Assignment



SN.	Name	I/O	Description
1	RSV	-	Reserved
2	RSV	-	Reserved
3	RSV	-	Reserved
4	RSV	-	Reserved
5	RSV	-	Reserved
6	VCC	P	main power supply
7	RSV	-	Reserved
8	RSV	-	Reserved
9	RESET	I	System reset (active low, active for at least 5 ms)
10	RSV	-	Reserved
11	RSV	-	Reserved
12	RSV	-	Reserved
13	EVENT1	I	Event triggered
14	GND	G	Ground
15	TXD 1	O	UART 1 output
16	RXD 1	I	UART 1 Input (Enter RTCM information)

17	GND	G	Ground
18	TXD2	O	UART 2 output
19	RXD2	I	UART 2 input
20	GND	G	Ground
twenty one	PV	-	Reserved
twenty two	GND	G	Ground
twenty three	P PS	O	Second pulse output
twenty four	RSV	-	Reserved
25	RSV	-	Reserved
26	RSV	-	Reserved
27	RSV	-	Reserved
28	RSV	-	Reserved

2.2 LED indicator status



SN.	LED indicator light	Working conditions
1	POWER	Power supply connected and red light remains on
2	PVT_STAT	PVT positioning indicator; blue light stays on after positioning.
3	ERR_STAT	An abnormality indicator has appeared; a red light is displayed.
4	RTK_STAT	RTK positioning indicator; the green light stays on after positioning.
5	PPS_STAT	The location green light flashes once per second.

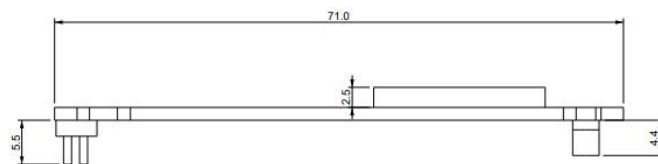
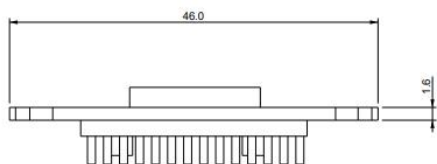
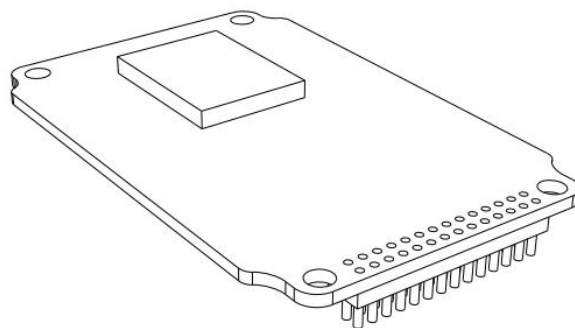
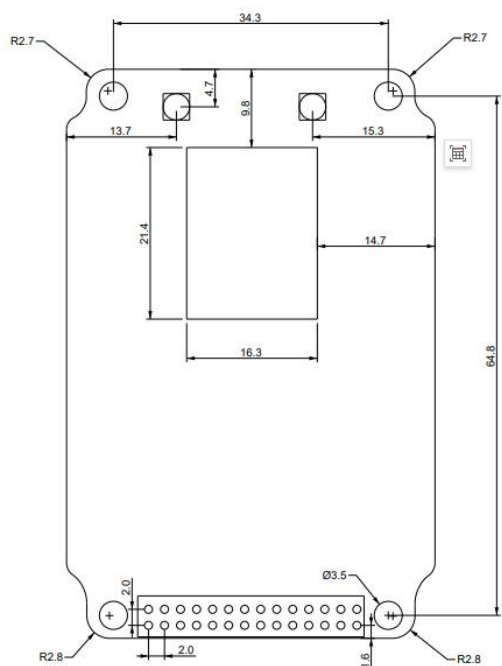
3 Electrical Specifications

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply voltage (VCC)	V _{CC}	3.8	5	12	V
Operating current*	capture	100mA@5V	131mA@5V	152mA@5V	mA
	track	100mA@5V	120mA@5V	140mA@5V	mA
VCC maximum ripple	V _{rpp}	0	--	50	mV
Storage temperature	T _{stg}	-55	--	95	°C
Operating temperature ¹	T _{opr}	-40	--	85	°C
Farad capacitors ²	T _{stg}	-25	--	60	°C
Humidity				95	%
ESD	VESD(HBM)	--	--	2000 (All pins)	V

*Because the product contains internal capacitors, an inrush current will be generated upon power-up. In practical applications, the impact of the voltage drop caused by the inrush current on the system needs to be assessed and confirmed .

- ¹. The current temperature range is the operating temperature range without supercapacitors.
- ². The warm start function will not be activated when the ambient temperature is below -25°C or above 60°C.

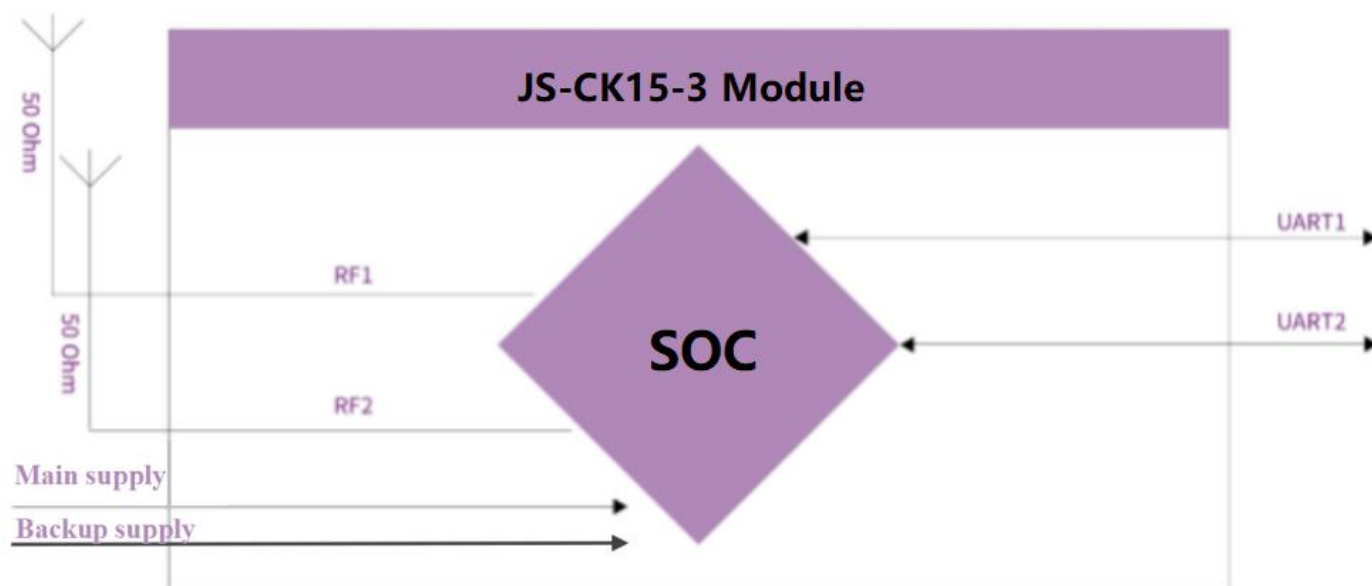
4. Mechanical Specifications



Unit: mm . Error : ± 0.5 mm .

5. Serial port configuration options

5.1 Principle Block Diagram



5.2 Application Circuit

