Accurate positioning

22°39'48.37"N 114°02'10.91"E

JS-MK43

PRODUCT SPECIFICATION

Data Sheet

Shenzhen Jumpstar Technology Co.,Ltd

Email : info@jumpstar-tech.com
Tel : (86) 0755-23732282
Fax : (86) 0755-23732823
Add : Room 213, Building B, Youth Pioneer Park, Jianshe East Road, Longhua District, Shenzhen, Guangdong Province, China, 518109.

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Change History of Revision

Revision	Date	Contents of Revision Change	Remark
V1.0	2019-01-18	First release	LPF
V1.1	2021-12-16	Added temperature description for farad capacitors	Wang Wei
V1.2	2022-01-08	Software upgrade	Wang Wei
V1.3	2022-05-10	Add TX2 output	Wang Wei
V1.4	2022-06-02	The 1PPS output is changed from TX2 to RX2 default output	Wang Wei

1 Functional description

1.1 Overview

The MK43 are concurrent GNSS receivers that can receive and track multiple GNSS systems. Owing to the multi-band RF front-end architecture, all three major GNSS constellations (GPS, GLONASS and BDS) can be received concurrently. All satellites in view can be processed to provide an RTK navigation solution when used with correction data. The MK43 receiver can be configured for concurrent GPS, GLONASS, and BDS plus QZSS reception to provide a high performance position reporting and navigation solution. Based on the high performance MK43 position engine, these receivers provide exceptional sensitivity and acquisition times and interference suppression measures enable reliable positioning even in difficult signal conditions.

1.2 Product features

- Build on high performance GNSS M6D
- 96 search channels and 60 trace channels
- Cold start acquisition sensitivity of -147dBm and -163dBm tracking sensitivity
- Max 10 Hz navigation update rate
- Supports GPS,BDS,GLONASS and QZSS
- Support the Beidou-3 satellite
- MSM7 input is supported
- Integrated TCXO, LNA, SAW, RTC
- Configurable peripheral IO pins
- Integrated high gain antenna
- Low power consumption and it has intelligent power control mechanism
- Single supply with wide voltage range
- Compact size (Bottom diameter47.2mm,Head diameter42.3mm,Height 36.8mm) ±0.3mm

1.3 Performance

Parameter	Specification	
Receiver type	■GPS/QZSS L1C/A L2C ■GLONASS G2 G1 ■BDS B1I B2I (Including the Beidou-3 satellite)	
Sensitivity	Tracking	-163dBm
	Reacquisition	-147dBm
Time-To-First-Fix[1]	Cold Start	≤35 s
	Warm Start	20s
	Hot Start	1 s
Position accuracy[2]	Autonomous	2.0 m CEP
	DGNSS	0.5m CEP
	RTK	2cm+1ppm (Horizontal)[3]
Accuracy of time pulse signal	RMS	25ns
Velocity accuracy[4]	GNSS	0.1 m/s
	D-GNSS	0.05 m/s
Operational limits[5]	Dynamics	≤ 4 g
	Altitude	18000 m
	Velocity	515 m/s
Baud Rate	115200-230400bps（Default 115200 bps）	
Navigation update rate	Default 1Hz (If you need a greater navigation update rate, please contact us)	

✌1 All satellites at ≥-130dBm

✌2 CEP 50%, 24 hours static, ≥-130dBm, ≥ 8SVs

✌3 Based on 30km, the accuracy error increases by 1cm every 10km from the base station

✌4 50% @ 30m/s dynamic operation

✌5 Assuming Airborne < 4 g platform

1.4 Supported GNSS constellations

The MK43 GNSS modules are concurrent GNSS receivers that can receive and track multiple GNSS systems. Owing to the multi band RF front-end architecture, all three major GNSS constellations (GPS L1+L2, GLONASS G1+G2 and BDS B1+B2) can be received concurrently. All satellites in view can be processed to provide an RTK navigation solution when used with correction data. The MK43 receiver can be configured for concurrent GPS, GLONASS, and BDS plus QZSS reception.

The MK43 supports the GNSS and their signals as shown in table

GPS	GLONASS	BDS
L1C/A (1575.42 MHz)	L1OF (1602 MHz + k*562.5 kHz, k = –7,..., 5, 6)	B1I (1561.098 MHz)
L2C (1227.60 MHz)	L2OF (1246 MHz + k*437.5 kHz, k = –7,..., 5, 6)	B2I (1207.140 MHz)

1.5 Antenna

The JS-MK43 module is designed for active antenna.

Parameter	Specification
Dimensions of passive antenna	φ35mm，high 25mm (Default)

1.6 Product Application

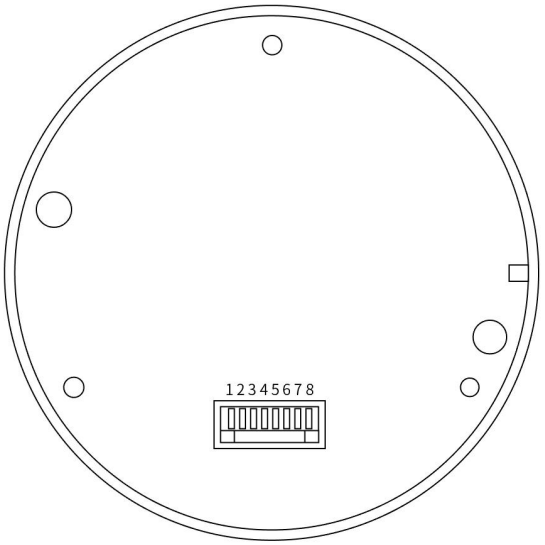
- Automatic pilot
- Aided driving
- Wisdom path field
- Intelligent safety testing
- Direct detection
- Vehicle management
- UAV
- Agricultural automation
- Intelligent city
- Intelligent robot

1.7 Protocols

Protocol	Type
NMEA 0183 V4.0/V4.1	Input/output
RTCM 3.X	Input/output
JMS	Input/output, JMS proprietary

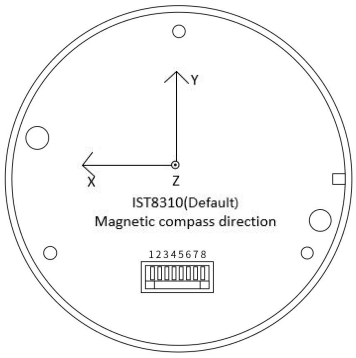
2 Pin definitions

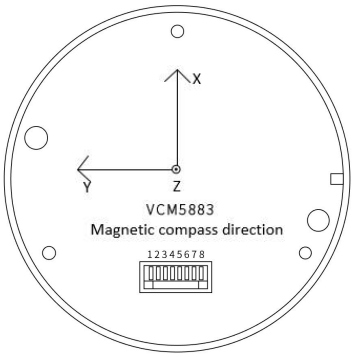
2.1 Pin assignment



No.	Name	I/O	Description
1	GND	G	Ground
2	TX2	O	UART2 output RTCM3 data
3	RX2	I	Serial Port(UART 2: for 1PPS output <Default>/RTCM3 input)
4	SDA	I/O	I2C Clock（keep open if not used）
5	SCL	I/O	I2C Clock（keep open if not used）
6	TX1	O	UART Output
7	RX1	I	UART Input
8	VCC	P	Main supply

2.2 Description of geomagnetic sensors





Note: Magnetic compass model: The geomagnetic model is VCM5883 , VCM5883_MS_ADDRESS 0x0C

The geomagnetic model is IST8310(Default) , IST8310_MS_ADDRESS 0x0F.

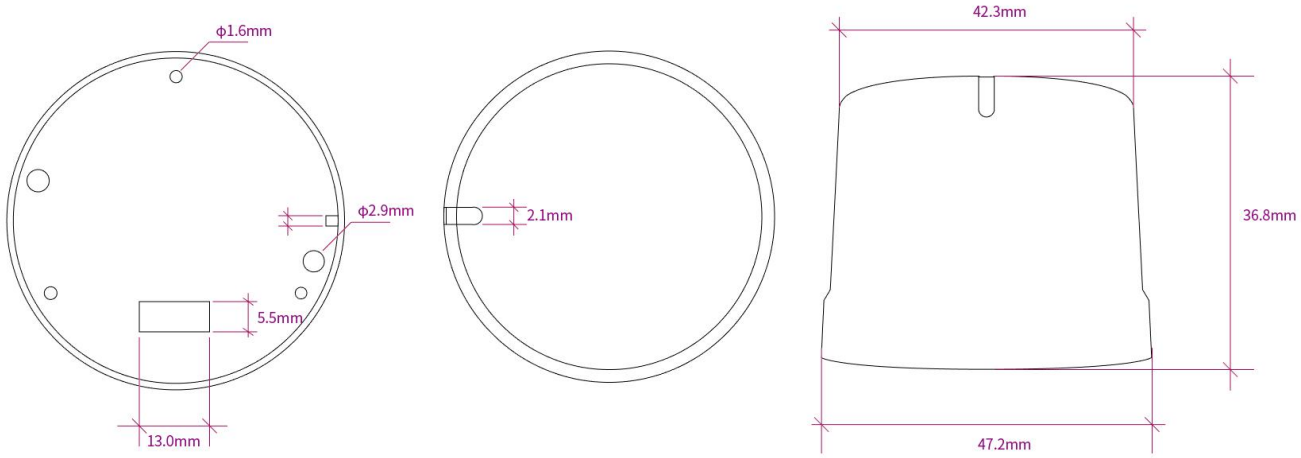
3 Electrical specifications

	Symbol	Min	Type	Max	Units
Power supply voltage	VCC	3.3	5.0	5.5	V
Average supply current	Acquisition	130@5.0V	170@5.0V	180@5.0V	mA
	Tracking	120@5.0V	150@5.0V	170@5.0V	mA
Backup battery			0.07		F
Digital IO voltage	Div	3.3		3.3	V
Storage temperature	Tstg	-40		85	℃
Operating temperature[1]	Topr	-40		85	℃
Farah capacitance[2]	Tstg	-25		60	℃
Humidity				95	%

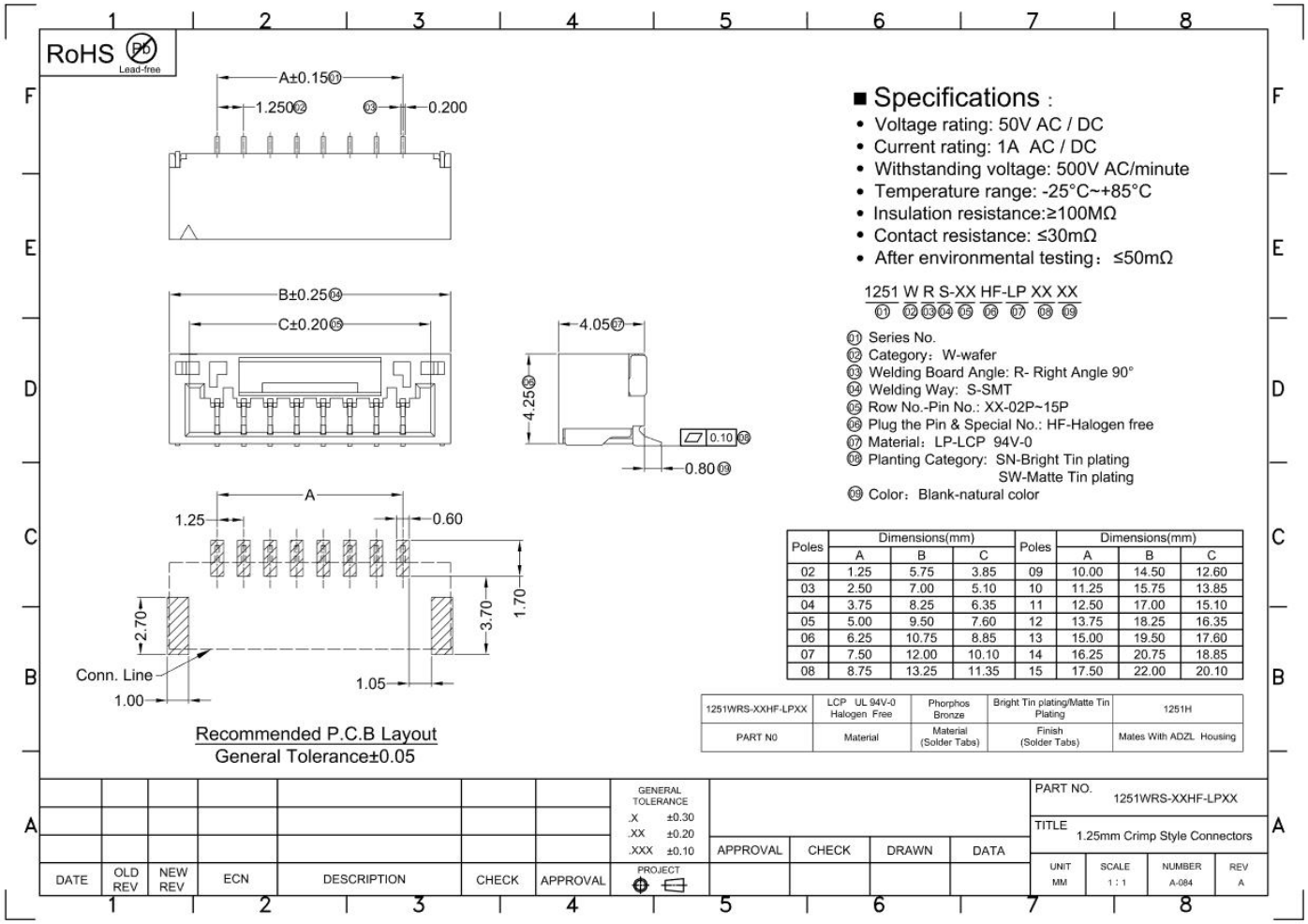
1 The temperature range is the operating temperature range without the Farad capacitor

2 Hot start cannot be carried out when the temperature is below -25℃ or above 60℃

4 Mechanical specifications



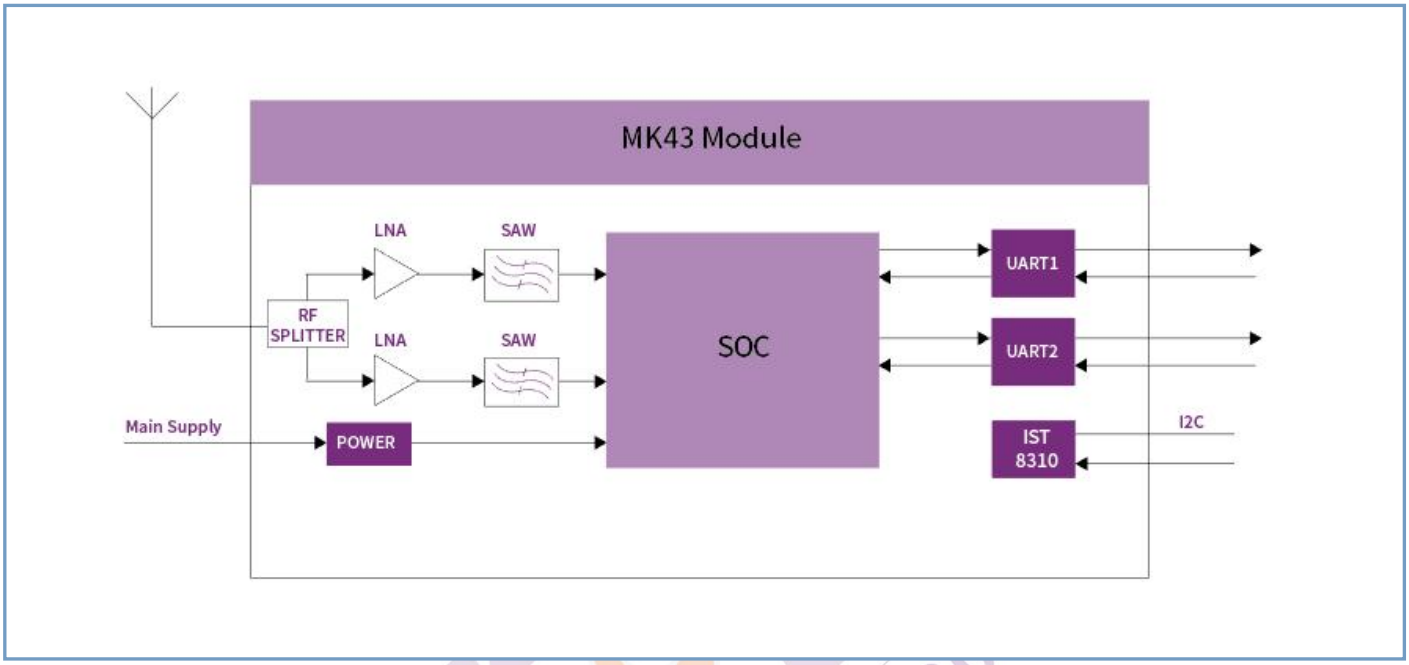
Unit: mm Error: ±0.3mm



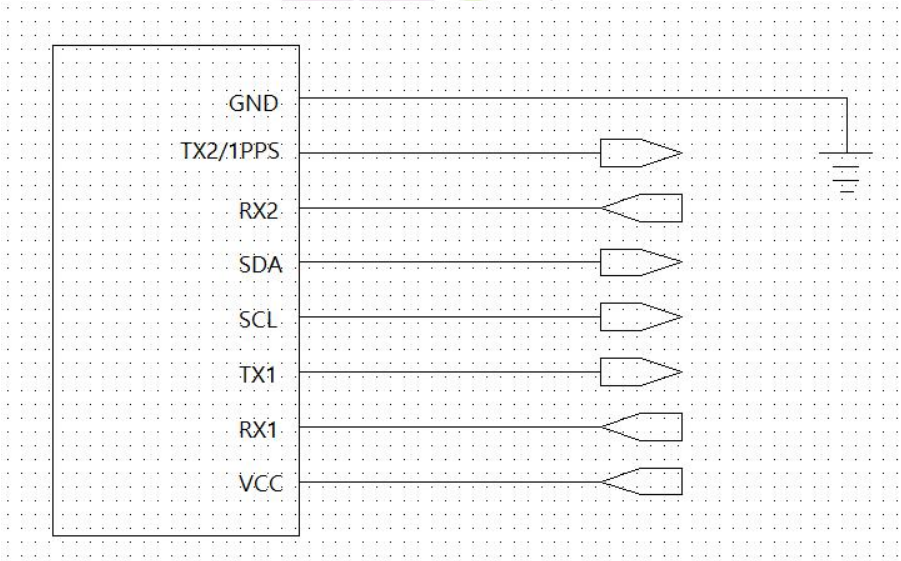
5 Interface configuration selections

5.1 Interfaces description

The MK43 module include two UART interface, which can be used for communication to a host. You can choose any one of the output interface output data, it supports configurable baud rates.



6 Application Circuit



7 ROHS

7.1 RoHS Compliance

This product is RoHS compliance