



Accurate  
positioning

22°39'48.37"N 114°02'10.91"E



# JS-UK43

## PRODUCT SPECIFICATION

### Data Sheet



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## Revision History

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	2022-05-05	Firmware 1.13 upgraded to 1.30	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 UK43 are concurrent GNSS receivers that can receive and track multiple satellites. Owing to the multi frequencies RF front-end architecture, all four major GNSS constellations (GPS, GLONASS Galileo 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 UK43 receiver can be configured for concurrent GPS, GLONASS, Galileo and BDS plus QZSS,SBAS reception to provide a high performance position reporting and navigation solution. Based on the high performance UK43 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 U9D
- 192 search channels and 60 trace channels
- Cold start acquisition sensitivity of -148dBm and -167dBm tracking sensitivity
- All GNSS up to 7Hz update rate
- Supports GPS,BDS, GLONASS, Galileo and QZSS,SBAS
- 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, Height36.8mm )  $\pm 0.5$ mm

### 1.3 Performance

Parameter	Specification	
Receiver type	<ul style="list-style-type: none"> <li>■GPS/QZSS/SBAS L1C/A L2C</li> <li>■GLONASS L1OF L2OF</li> </ul>	<ul style="list-style-type: none"> <li>■ Galileo E1 E5b</li> <li>■BDS B1I B2I</li> </ul>
Sensitivity	Tracking	-167dBm
	Reacquisition	-148dBm
Time-To-First-Fix <sup>1</sup>	Cold Start	25 s
	Warm Start	20s
	Hot Start	2 s
Horizontal	PVT <sup>2</sup>	1.5 m CEP
	SBAS <sup>2</sup>	1.0m CEP
Position accuracy	RTK	2cm+1ppm (Horizontal) <sup>3</sup>
Accuracy of time pulse signal	RMS	30ns
Velocity accuracy <sup>4</sup>	GNSS	0.05 m/s
Operational limits <sup>5</sup>	Dynamics	≤ 4 g
	Altitude	80000 m
	Velocity	500 m/s
Baud Rate	9600-921600 bps (Default 38400 bps)	
Max navigation update rate	RTK(GPS)	20Hz
	RTK(GNSS)	7Hz

∅<sub>1</sub> All satellites at ≥-130dBm,24 hours static

∅<sub>2</sub> CEP, 50%, 24 hours static, ≥-130dBm, > 8SVs

∅<sub>3</sub> Based on 30km, the accuracy error increases by 1cm every 10km from the base station

∅<sub>4</sub> 50% @ 30m/s dynamic operation

∅<sub>5</sub> Assuming Airborne < 4 g platform

## 1.4 Supported GNSS constellations

The UK43 GNSS modules are concurrent GNSS receivers that can receive and track multiple GNSS systems. Owing to the multi-band RF front-end architecture, all four major GNSS constellations (GPS L1 L2, GLONASS G1 G2, Galileo E1 E5b and BDS B1I B2I) can be received concurrently. All satellites in view can be processed to provide an RTK navigation solution when used with correction data. The UK43 receiver can be configured for concurrent GPS, GLONASS, Galileo and BDS plus QZSS reception.

The UK43 supports the GNSS and their signals as shown in table

GPS	GLONASS	BDS	Galileo
L1C/A (1575.42 MHz)	L1OF (1602 MHz + k*562.5 kHz, k = -7,..., 5, 6)	B1I (1561.098 MHz)	E1-B/C (1575.42 MHz)
L2C (1227.60 MHz)	L2OF (1246 MHz + k*437.5 kHz, k = -7,..., 5, 6)	B2I (1207.140 MHz)	E5b (1207.140 MHz)

## 1.5 Antenna

The JS-UK43 module is designed for passive antenna.

### Parameter

### Specification

Dimensions of passive antenna       $\varnothing$ 35mm, high 25mm (Default)

## 1.6 Product Application

- Hand-held terminal
- Wisdom path field
- Direct detection
- UAV
- Intelligent city
- Aided driving
- Intelligent safety testing
- Vehicle management
- Agricultural automation
- Intelligent robot

## 1.7 Protocols

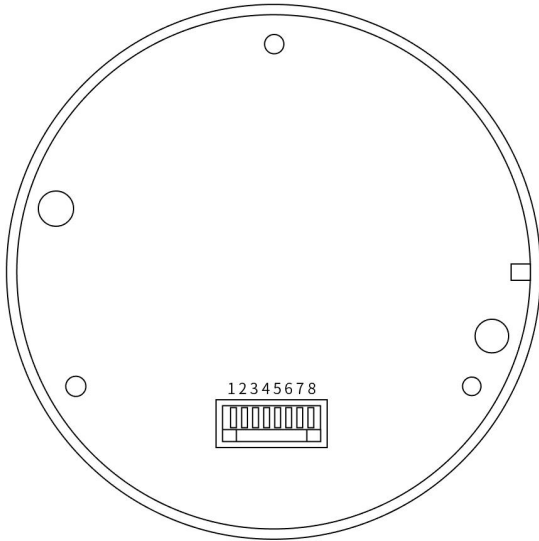
### Protocol

### Type

NMEA 4.11 (default), 4.10, 4.0, 2.3, 2.1	Input/output
RTCM 3.3	Input/output
UBX	Input/output, UBX proprietary

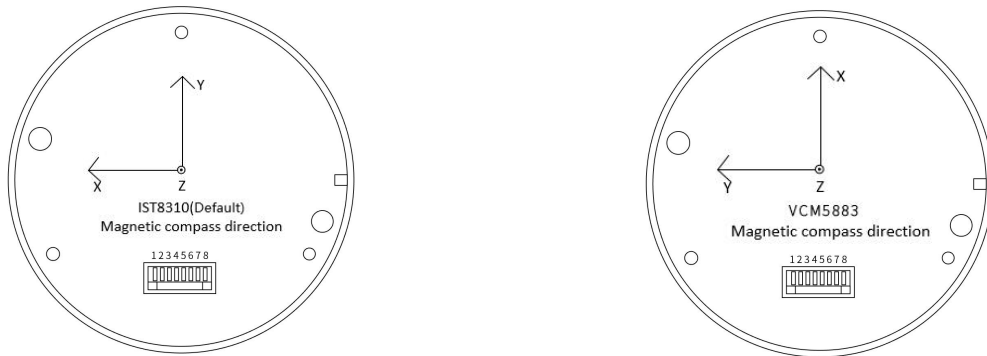
## 2. Pin definitions

### 2.1 Pin assignment



No.	Name	I/O	Description
1	GND	G	Ground
2	TX2	O	UART 2 output RTCM3 data
3	RX2/PPS	I/O	Serial Port(UART 2: for 1PPS output < Default>/RTCM3 input)
4	SDA	I/O	I2C Data (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.

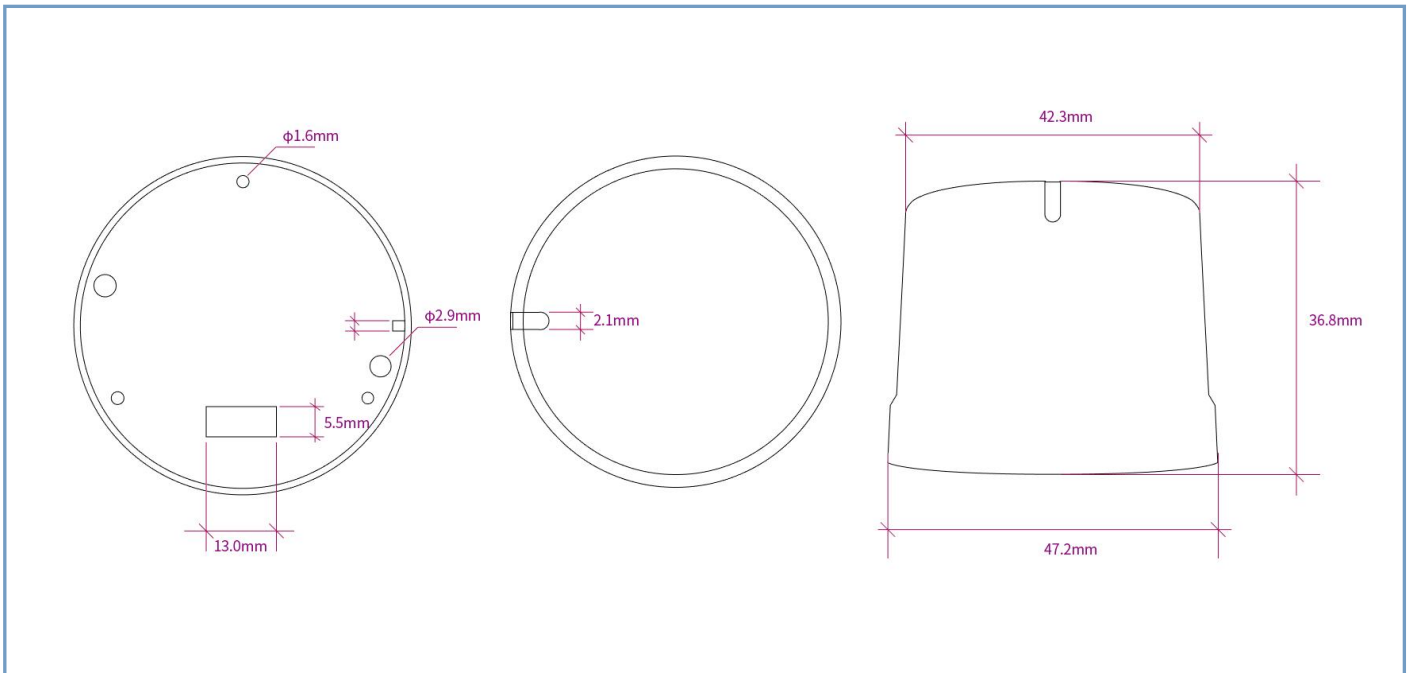
## 3. Electrical specifications

Parameter	Symbol	Min	Type	Max	Units
Power supply voltage	VCC	3.3	5.0	5.5	V
Average supply current	Acquisition	110@5.0V	120@5.0V	140@5.0V	mA
	Tracking	110@5.0V	120@5.0V	130@5.0V	mA
Backup battery			0.07		F
Digital IO voltage	Div	3.3		3.3	V
Storage temperature	Tstg	-40		85	°C
Operating temperature <sup>1</sup>	Topr	-40		85	°C
Farah capacitance <sup>2</sup>	Tstg	-25		60	°C
Humidity				95	%

<sup>1</sup> The temperature range is the operating temperature range without the Farad capacitor

<sup>2</sup> Hot start cannot be carried out when the temperature is below -20°C or above 60°C

# 4 Mechanical specifications



Unit: mm Error: ±0.5mm

RoHS

**Recommended P.C.B Layout**  
General Tolerance±0.05

**Specifications :**

- Voltage rating: 50V AC / DC
- Current rating: 1A AC / DC
- Withstanding voltage: 500V AC/minute
- Temperature range: -25°C~+85°C
- Insulation resistance: ≥100MΩ
- Contact resistance: ≤30mΩ
- After environmental testing: ≤50mΩ

1251 W R S-XX HF-LP XX XX  
①②③④⑤⑥⑦⑧⑨

- ① Series No.
- ② Category: W-wafer
- ③ Welding Board Angle: R- Right Angle 90°
- ④ Welding Way: S-SMT
- ⑤ Row No.-Pin No.: XX-02P~15P
- ⑥ Plug the Pin & Special No.: HF-Halogen free
- ⑦ Material: LP-LCP 94V-0
- ⑧ Planting Category: SN-Bright Tin plating  
SW-Matte Tin plating
- ⑨ Color: Blank-natural color

Poles	Dimensions(mm)			Poles	Dimensions(mm)		
	A	B	C		A	B	C
02	1.25	5.75	3.85	09	10.00	14.50	12.60
03	2.50	7.00	5.10	10	11.25	15.75	13.85
04	3.75	8.25	6.35	11	12.50	17.00	15.10
05	5.00	9.50	7.60	12	13.75	18.25	16.35
06	6.25	10.75	8.85	13	15.00	19.50	17.60
07	7.50	12.00	10.10	14	16.25	20.75	18.85
08	8.75	13.25	11.35	15	17.50	22.00	20.10

1251WRS-XXHF-LPXX	LCP UL 94V-0 Halogen Free	Phorpos Bronze	Bright Tin plating/Matte Tin Plating	1251H
PART NO	Material	Material (Solder Tabs)	Finish (Solder Tabs)	Mates With ADZL Housing

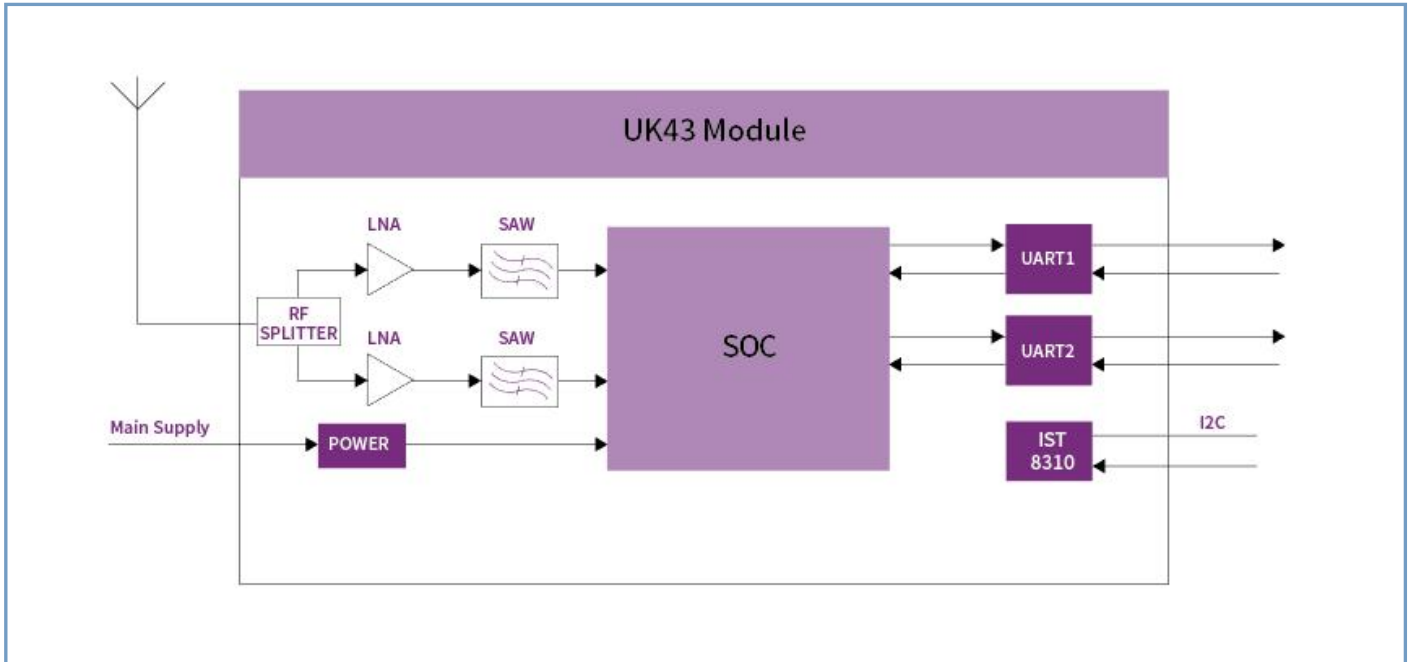
DATE	OLD REV	NEW REV	ECN	DESCRIPTION	CHECK	APPROVAL	PROJECT
1				2			3
				4			

PART NO. 1251WRS-XXHF-LPXX			
TITLE 1.25mm Crimp Style Connectors			
UNIT	SCALE	NUMBER	REV
MM	1:1	A-084	A

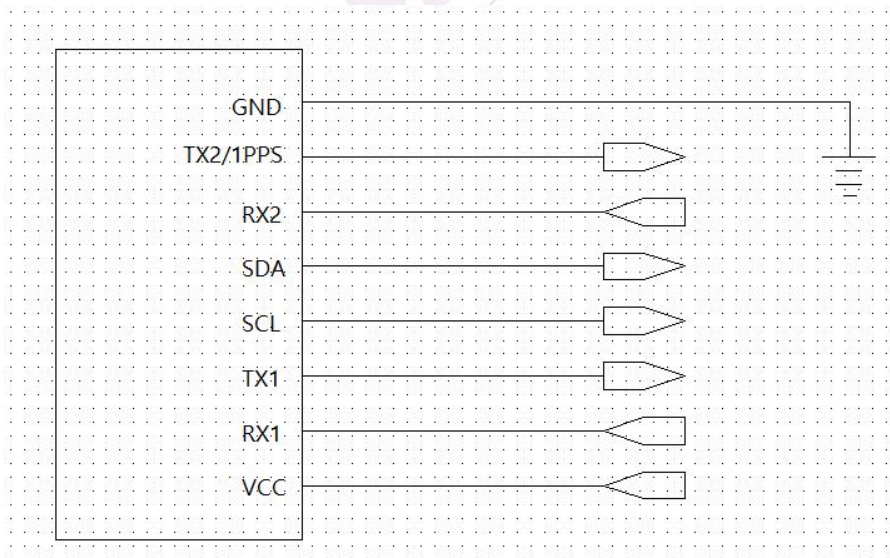
## 5. Interface configuration selections

### 5.1 Interfaces description

The UK43 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

This product is RoHS compliance.