

JS-UK40

High Precision GNSS Helix Antenna Module

Data Sheet



Table of Contents

Revision History	3
1 Functional description	4
1.1 Overview	4
1.2 Product features	4
1.3 Performance	5
1.4 Supported GNSS constellations	6
1.5 Antenna	6
1.6 Product Applications	6
1.7 Protocols	6
2 Pin Definitions	7
2.1 Pin assignment	7
2.2 Description of geomagnetic sensors	8
3 Electrical specifications	8
4 Mechanical specifications	9
5 Interface configuration selections	10
6 ROHS	10

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1 Functional description

1.1 Overview

The UK40 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, 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 40 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 40 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 diameter39.80mm,Head diameter35.00mm,Height 32.00mm) $\pm 0.3\text{mm}$

1.3 Performance

Parameter	Specification	
Receiver type	■GPS/QZSS/SBAS L1C/A L2C ■ Galileo E1 E5b ■GLONASS L1OF L2OF ■BDS B1I B2I	
Sensitivity	Tracking	-167dBm
	Reacquisition	-148dBm
Time-To-First-Fix ¹	Cold Start	25s
	Warm Start	20s
	Hot Start	2s
Horizontal Position accuracy	PVT ²	1.5m CEP
	SBAS ²	1.0m CEP
	RTK	2cm+1ppm (Horizontal) ³
Accuracy of time pulse signal	RMS	30ns
Velocity accuracy ⁴	GNSS	0.05m/s
Operational limits ⁵	Dynamics	≤ 4g
	Altitude	80000m
	Velocity	500m/s
Baud Rate	9600-921600 bps (Default 38400 bps)	
Max navigation update rate	RTK(GPS)	20Hz
	RTK(GNSS)	7Hz

✎₁ All satellites at ≥-130dBm, 24 hours static

✎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 < 4g platform

1.4 Supported GNSS constellations

The 40 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 40 receiver can be configured for concurrent GPS, GLONASS, Galileo and BDS plus QZSS reception.

The 40 supports the GNSS and their signals as shown in table.

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

1.5 Antenna

The JS-UK40 module is designed for active antenna.

Parameter	Specification
Dimensions of passive antenna	$\phi 35\text{mm}$, high 25mm (Default)

1.6 Product Applications

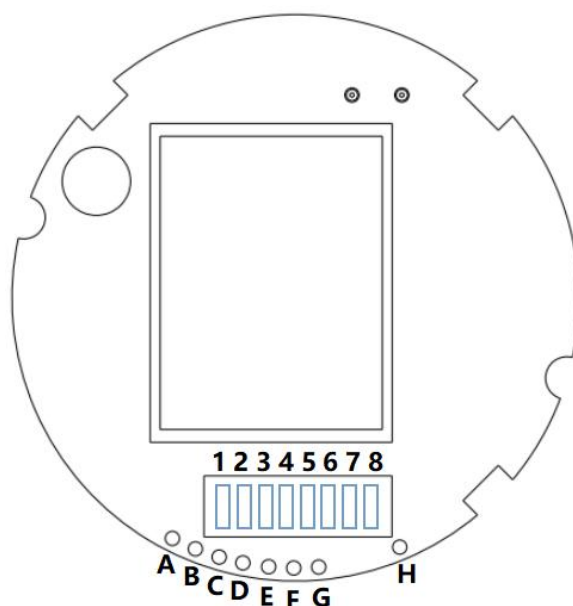
- Hand-held terminal
- Wisdom path field
- Direct detection
- UAV
- Intelligent city
- Aided driving
- Intelligent safety testing
- Vehicle management
- Agricultural automation
- Intelligent robot

1.7 Protocols

Protocol	Type
NMEA 0183 V 4.11 (default), 4.10, 4.0, 2.3, 2.1	Input/output
RTCM 3.3	Input/output
UBX	Input/output, UBX proprietary

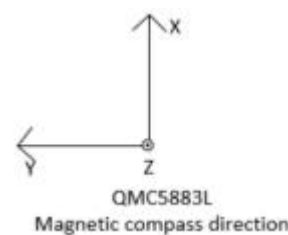
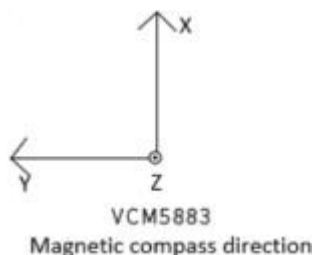
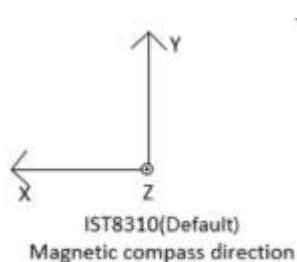
2 Pin definitions

2.1 Pin assignment



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

2.2 Description of geomagnetic sensors



Note:

Magnetic compass model:

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

The geomagnetic model VCM5883 (optional) , VCM5883_MS_ADDRESS 0x0C.

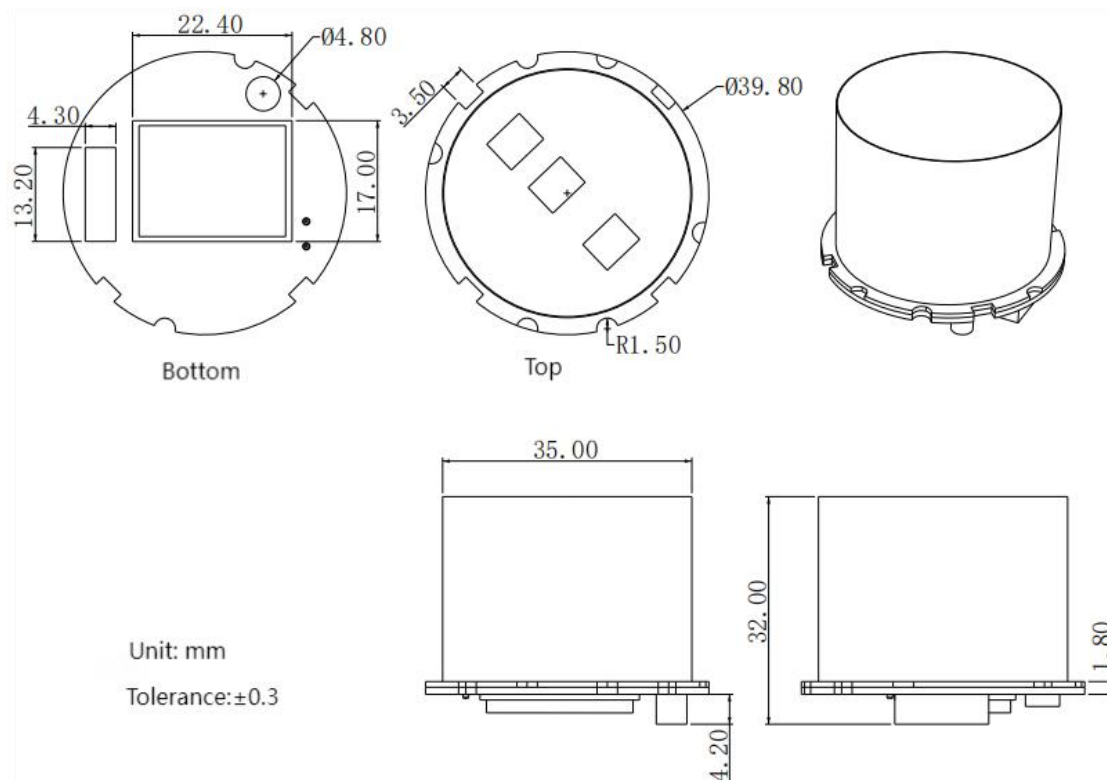
The geomagnetic modelQMC5883L (optional) ,QMC5883L_MS_ADDRESS 0x0D

3 Electrical specifications

Parameter	Symbol	Min	Typical	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 ¹	Topr	-40		85	°C
Farah capacitance ²	Tstg	-25		60	°C
Humidity				95	%

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

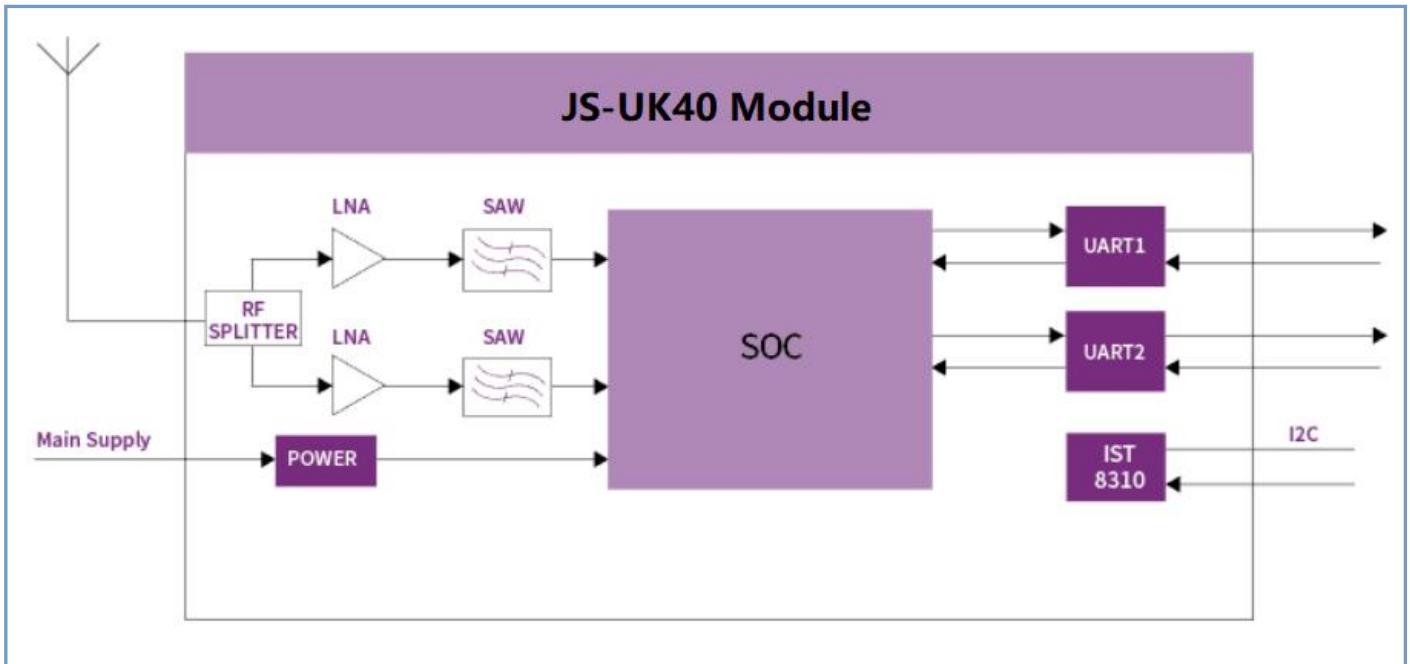
² Hot start cannot be carried out when the temperature is below -20°C or above 60°C

Unit: mm Error: $\pm 0.3\text{mm}$

5 Interface configuration selections

5.1 Interfaces description

The 40 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 ROHS

This product is RoHS compliant.