

JS-NK40

High Precision GNSS Helix Antenna Module

Data sheet



Table of Contents

Revision History	3
1 Product Introduction	4
1.1 Overview	4
1.2 Product Features	4
1.3 Performance Metrics	5
1.4 Protocols	5
1.5 Antenna	5
1.6 Application Scenarios	6
2 Pin Definitions	6
2.1 Pin Assignment	6
2.2 Description of Geomagnetic Sensors	7
3 Electrical Specifications	7
4 Mechanical specifications	8
5 Interface Configuration Selections	9
5.1 Interfaces Description	9
6 Application Circuit	9
7 ROHS	9

1 Product Introduction

1.1 Overview

The JS-NK40 is a high-precision GNSS antenna module that supports multi-system, multi-frequency on-chip RTK positioning solution. Based on a new generation of high-performance GNSS chips, it features a built-in 2GHz dual-core CPU, advanced anti-interference unit, and integrates a high-speed floating-point processor and a dedicated RTK coprocessor. It supports 1408 super channels, providing more powerful satellite navigation signal processing capabilities, ensuring reliable and accurate positioning even in complex electromagnetic environments. It is a new product launched by to meet the high-precision positioning application needs of markets such as drones, lawnmowers, precision agriculture, and surveying and mapping.

1.2 Product Features

- Based on high-performance JS-N2 module
- Supports 1408 super channels
- Supports multi-system multi-frequency high-precision RTK solution
- RTK positioning data update rate up to 20Hz
- Supports BDS B1I/B2I/B3I+GPS L1/L2/L5+GLONASS L1/L2+Galileo E1/E5a/E5b+QZSS L1/L2/L5+SBAS
- Automatic identification of differential input RTCM format
- Integrated TCXO, LNA, SAW, RTC
- Integrated high-gain helical antenna
- Lightweight and compact (39.80mm x35.00mm×32.0mm±0.3mm), <10.2g
- Instant RTK initialization

1.3 Performance Metrics

Performance	Specifications												
Receiver type	<ul style="list-style-type: none"> ■BDS B1I、B2I、B3I ■GPS L1C/A、L2P (Y)/L2C、L5 ■GLONASS L1、L2 ■Galileo E1、E5a、E5b ■QZSS L1、L2、L5 												
Time-To-First-Fix ¹	Cold Start <30s												
Positioning Accuracy ²	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Horizontal</th> <th>Vertical</th> </tr> </thead> <tbody> <tr> <td>3D(RMS)</td> <td>1.5 m</td> <td>2.5 m</td> </tr> <tr> <td>DGPS(RMS)</td> <td>0.4 m+1 ppm</td> <td>0.8 m+1ppm</td> </tr> <tr> <td>RTK(RMS)</td> <td>1.5 cm+1ppm</td> <td>2.0 cm+1ppm</td> </tr> </tbody> </table>		Horizontal	Vertical	3D(RMS)	1.5 m	2.5 m	DGPS(RMS)	0.4 m+1 ppm	0.8 m+1ppm	RTK(RMS)	1.5 cm+1ppm	2.0 cm+1ppm
		Horizontal	Vertical										
	3D(RMS)	1.5 m	2.5 m										
DGPS(RMS)	0.4 m+1 ppm	0.8 m+1ppm											
RTK(RMS)	1.5 cm+1ppm	2.0 cm+1ppm											
Time Accuracy(RMS)	20ns												
Velocity Accuracy (RMS) ³	0.03m/s												
Initialization Time ²	< 5s(typical)												
Baud Rate	9600- 921600 bps (default 115200bps)												
Data Update Rate	20Hz												

⊘1 -130dBm, ≥12 satellites used

⊘2 Test results may vary due to atmospheric conditions, baseline length, multi-path effects, number of visible satellites, and satellite geometry.

⊘3 Open sky, unobstructed scenario, 99%@static

1.4 Protocols

Parameter	Protocol
Data Format	NMEA 0183, Unicore
Differential Data	RTCM3.X

1.5 Antenna

The JS-NK40 module uses an active antenna design.

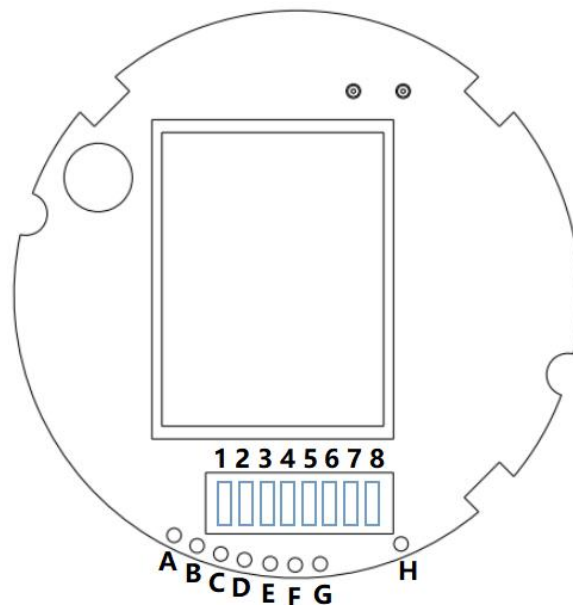
Parameter	Specification
Helical Antenna	φ35mm, Height 25mm

1.6 Application Scenarios

- UAV/Drones
- Automotive Applications
- Precision Agriculture
- Handheld Devices
- Logistics Security
- Surveying and Mapping
- Robotics
- Smart Ports
- Electric Power Grid
- Smart Transportation

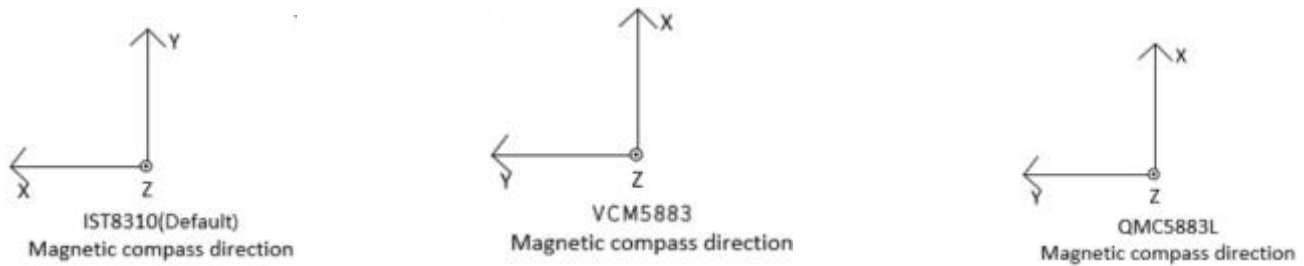
2 Pin Definitions

2.1 Pin Assignment



No.	Name	I/O	Description
1. A	GND	-	Ground
2. B	TX2	O	UART 2 output RTCM3 data
3. C	PPS/RX2	O/I	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 1 data output
7. G	RX1	I	UART 1 data input
8. H	VCC	P	Main Supply

2.2 Description of Geomagnetic Sensors



Note:

Magnetic compass model:

The geomagnetic model IST8310(Default) , IST8310_MS_ADDRESS 0x0F;

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

The geomagnetic model QMC5883L (optional) ,QMC5883L_MS_ADDRESS 0x0D.

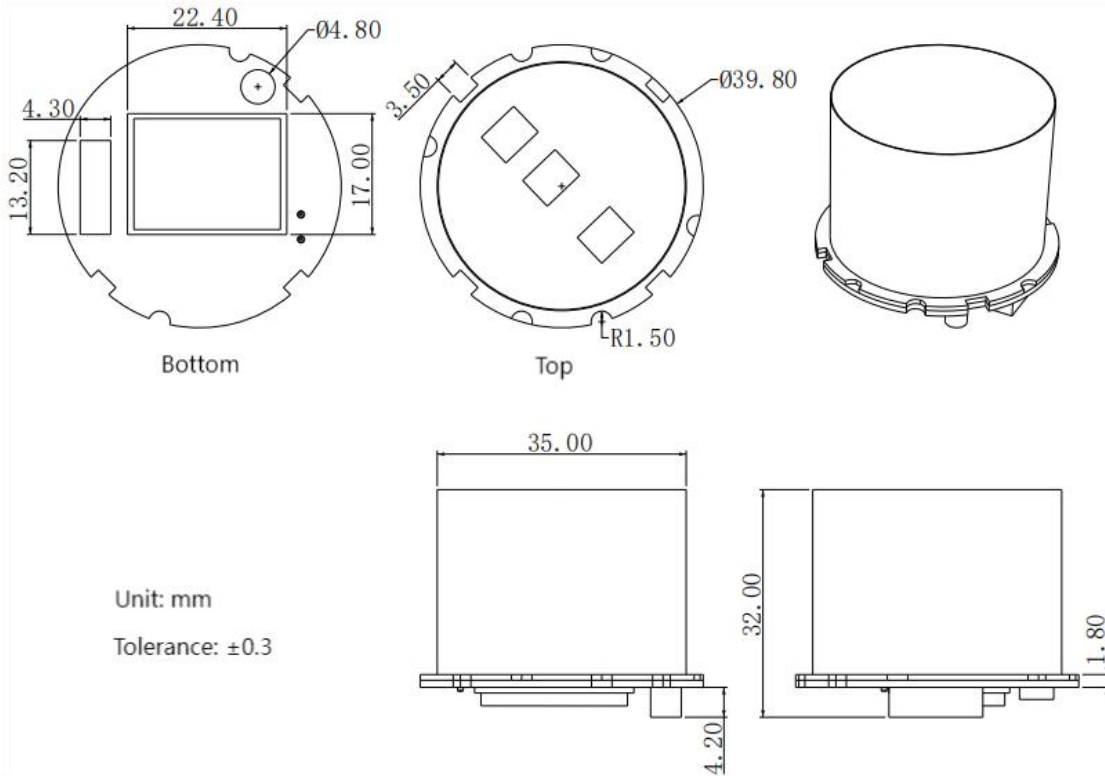
3 Electrical Specifications

Parameter	Symbol	Min	Typical	Max	Units
Power supply voltage (VCC)	VCC	3.3	5.0	5.5	V
Operating Current	I	180mA @3.3V	220mA @3.3V	310mA @3.3V	mA
Backup Power			0.07		F
VCC Max Ripple	Vrpp	0	--	50	mV
MSD(MSL) Level	Level 3	--	--	--	--
Storage Temperature	Tstg	-40	--	85	°C
Operating Temperature ¹	Topr	-40	--	85	°C
Farad Capacitor 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 -25°C or above 60°C

4 Mechanical specifications

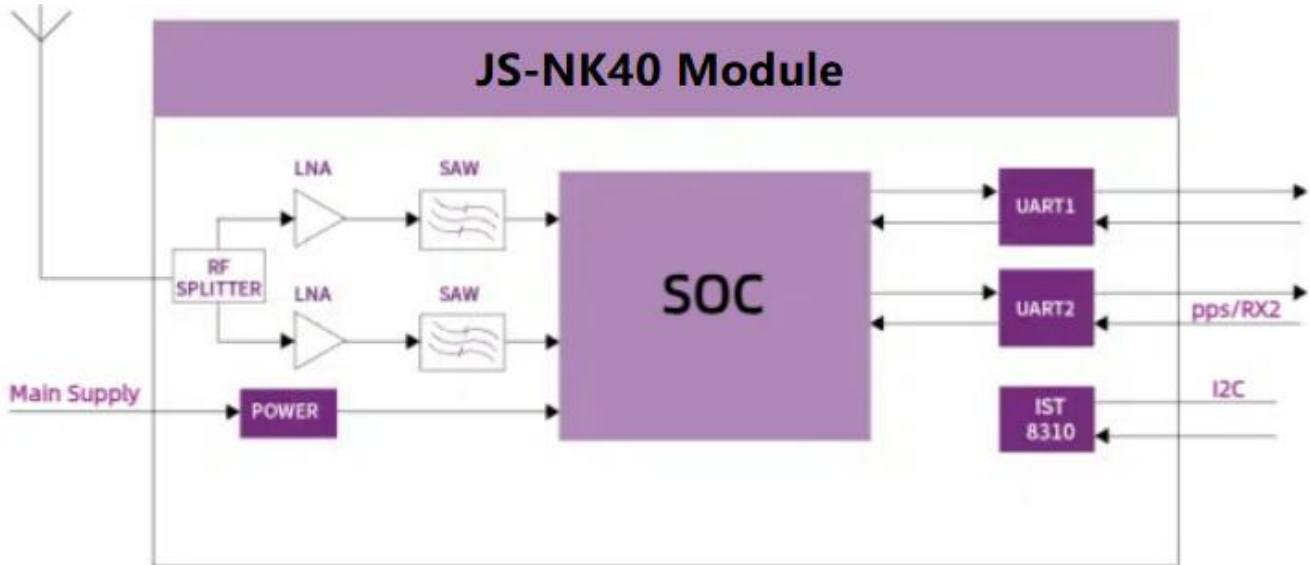


1	2	3	4	5	6	7	8																																																																						
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>RoHS </p> <p>Recommended P.C.B Layout General Tolerance±0.05</p> </div> <div style="width: 45%;"> <p>Specifications :</p> <ul style="list-style-type: none"> • 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 <p>1251 W R S-XX HF-LP XX XX</p> <p>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</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Poles</th> <th colspan="3">Dimensions(mm)</th> <th rowspan="2">Poles</th> <th colspan="3">Dimensions(mm)</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr><td>02</td><td>1.25</td><td>5.75</td><td>3.85</td><td>09</td><td>10.00</td><td>14.50</td><td>12.60</td></tr> <tr><td>03</td><td>2.50</td><td>7.00</td><td>5.10</td><td>10</td><td>11.25</td><td>15.75</td><td>13.85</td></tr> <tr><td>04</td><td>3.75</td><td>8.25</td><td>6.35</td><td>11</td><td>12.50</td><td>17.00</td><td>15.10</td></tr> <tr><td>05</td><td>5.00</td><td>9.50</td><td>7.60</td><td>12</td><td>13.75</td><td>18.25</td><td>16.35</td></tr> <tr><td>06</td><td>6.25</td><td>10.75</td><td>8.85</td><td>13</td><td>15.00</td><td>19.50</td><td>17.60</td></tr> <tr><td>07</td><td>7.50</td><td>12.00</td><td>10.10</td><td>14</td><td>16.25</td><td>20.75</td><td>18.85</td></tr> <tr><td>08</td><td>8.75</td><td>13.25</td><td>11.35</td><td>15</td><td>17.50</td><td>22.00</td><td>20.10</td></tr> </tbody> </table> </div> </div>								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
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																																																																						
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>1251WRS-XXHF-LPXX</td> <td>LCP UL 94V-0 Halogen Free</td> <td>Phosphor Bronze</td> <td>Bright Tin plating/Matte Tin Plating</td> <td>1251H</td> </tr> <tr> <td>PART NO</td> <td>Material</td> <td>(Solder Tabs)</td> <td>Finish (Solder Tabs)</td> <td>Mates With AD2L Housing</td> </tr> </table>								1251WRS-XXHF-LPXX	LCP UL 94V-0 Halogen Free	Phosphor Bronze	Bright Tin plating/Matte Tin Plating	1251H	PART NO	Material	(Solder Tabs)	Finish (Solder Tabs)	Mates With AD2L Housing																																																												
1251WRS-XXHF-LPXX	LCP UL 94V-0 Halogen Free	Phosphor Bronze	Bright Tin plating/Matte Tin Plating	1251H																																																																									
PART NO	Material	(Solder Tabs)	Finish (Solder Tabs)	Mates With AD2L Housing																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="4">GENERAL TOLERANCE</td> <td colspan="4">PART NO. 1251WRS-XXHF-LPXX</td> </tr> <tr> <td colspan="4">X ±0.30</td> <td colspan="4">TITLE 1.25mm Crimp Style Connectors</td> </tr> <tr> <td colspan="4">.XX ±0.20</td> <td colspan="4">UNIT MM</td> </tr> <tr> <td colspan="4">.XXX ±0.10</td> <td colspan="4">SCALE 1:1</td> </tr> <tr> <td colspan="4">PROJECT</td> <td colspan="4">NUMBER A-084</td> </tr> <tr> <td colspan="4">APPROVAL</td> <td colspan="4">REV A</td> </tr> </table>								GENERAL TOLERANCE				PART NO. 1251WRS-XXHF-LPXX				X ±0.30				TITLE 1.25mm Crimp Style Connectors				.XX ±0.20				UNIT MM				.XXX ±0.10				SCALE 1:1				PROJECT				NUMBER A-084				APPROVAL				REV A																									
GENERAL TOLERANCE				PART NO. 1251WRS-XXHF-LPXX																																																																									
X ±0.30				TITLE 1.25mm Crimp Style Connectors																																																																									
.XX ±0.20				UNIT MM																																																																									
.XXX ±0.10				SCALE 1:1																																																																									
PROJECT				NUMBER A-084																																																																									
APPROVAL				REV A																																																																									
DATE	OLD REV	NEW REV	ECN	DESCRIPTION	CHECK	APPROVAL	PROJECT																																																																						
1			2	3	4	5	6																																																																						
7	8	9	10	11	12	13	14																																																																						

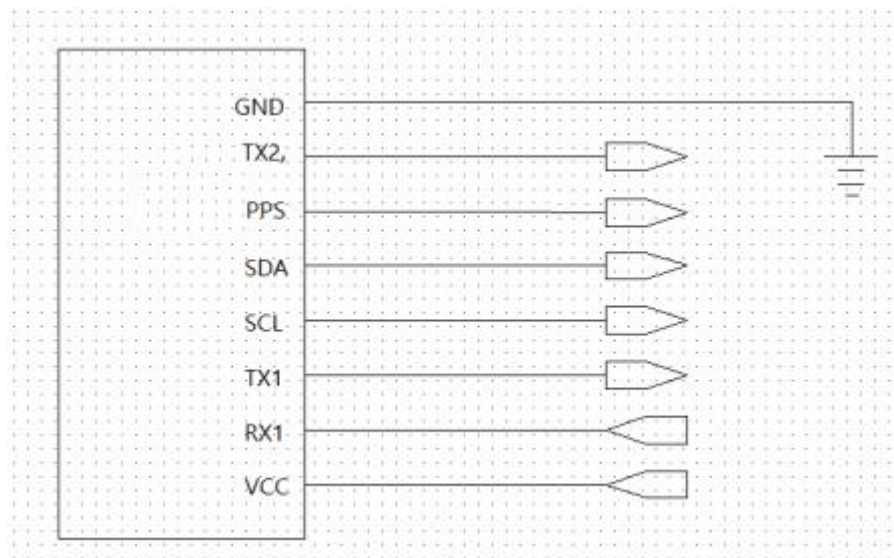
5 Interface Configuration Selections

5.1 Interfaces Description

The JS-NK40 module contains two UART interfaces, which can be used for communication with a host. Either output interface can be selected to output data, and it supports configurable baud rates.



6 Application Circuit



7 ROHS

This product is RoHS compliant.