



JS-AUP20FG-1

Data Sheet

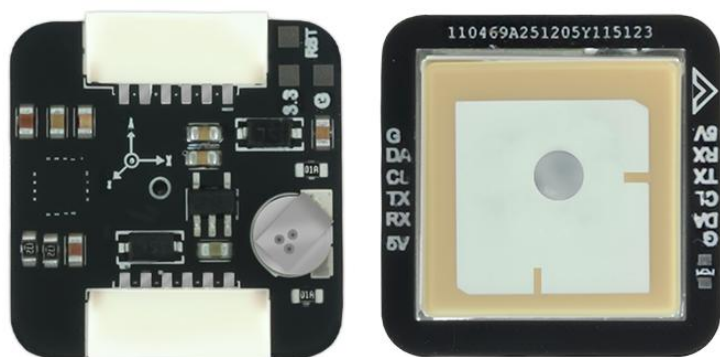


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1. Product Description

1.1 Overview

The JS-AUP20FG-1 is a low-power, high-performance GNSS module optimized for L1 frequency systems. It delivers excellent sensitivity and fast positioning, supporting concurrent reception from four major constellations: GPS, GLONASS, Galileo, and BDS.

By tracking a high number of satellites, it selects the strongest signals to maximize positioning availability and reliability. The module includes advanced anti-interference capabilities, with built-in detection for jamming and spoofing, along with filtering algorithms to reduce RF noise impact.

Additionally, it integrates a geomagnetic sensor to provide attitude and heading data, making it well-suited for applications such as UAVs and smart robots.

1.2 Product Features

- Based on high-performance GNSS chip
- Cold start acquisition sensitivity: -148dBm; Tracking sensitivity: -166dBm
- Navigation update rate up to 10Hz
- Supports BDS, GPS, QZSS, SBAS, GLONASS, Galileo
- Supports A-GNSS
- Integrated TCXO, LNA, SAW, RTC
- Equipped with geomagnetic sensor
- Supports standard NMEA0183
- Compact size (20.0mm x 20.0mm x 12.20mm ± 0.3 mm) suitable for space-sensitive applications;
- Lightweight <7.8g

1.3 Performance Metrics

Category	Specifications	
Constellations&Frequencies*	■GPS/QZSS L1C/A ■GLONASS L1OF	■SBAS EGNOS, GAGAN, MSAS and WAAS ■BDS B1I,B1C ■Galileo E1B/C
Sensitivity	Tracking & Navigation: Reacquisition: Cold Start: Hot Start:	-166dBm -160dBm -148dBm -160dBm
Time To First Fix ¹	Cold Start: Hot Start:	29 s 1 s
Horizontal Positioning Accuracy ²	Automatic SBAS	2.0 m CEP 1.5 m CEP
Time Pulse Signal Accuracy	RMS 99%	30 ns 60 ns
Velocity Accuracy ³		0.05 m/s
Operating Limits ⁴	Dynamic Altitude Velocity	≤ 4 g 80000 m 500 m/s
Time Pulse Frequency	1Hz	
Baud Rate	9600 -- 921600 bps (default 38400 bps, configurable)	
Maximum Data Update Rate	10 Hz (default 1Hz, configurable)	

* Default configuration is GPS+Galileo+QZSS+SBAS. BDS B1I cannot be enabled simultaneously with BDS B1C or GLONASS L1OF

¹ All satellites at ≥-130dBm

² CEP 50%, 24-hour static, ≥-130dBm, > 6SVs

³ 50% dynamic operation at a speed of 30m/s

⁴ Assuming Airborne < 4 g platform

1.4 Protocols

Protocol	Type
NMEA v2.1, 2.3, 4.0, 4.10 and 4.11 (default)	Input/Output, ASCII
Binary	Input/Output, Private Binary

1.5 Antenna

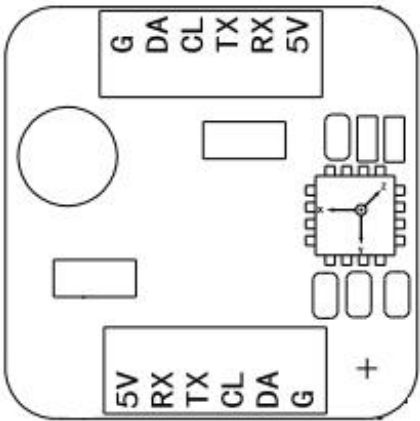
Type	Specifications
Passive Antenna	15.0*15.0*4.0mm

1.6 Product Applications

- FPV Drones
 - Marine Navigation, Fleet Management
 - Aerial Photography Drones
 - Educational/Training Drones
 - Smart Robots
- UAV/Drones
 - Formation UAVs
 - Inspection UAVs
 - Smart Logistics Dispatch
 - Unmanned Surface Vessel (USV)

2. Pin Definitions

2.1 Pin Assignment



PIN Name	I/O	Description
5V	P	Main Power Supply, 3.0~5.5V, typically 5V
RX	I	GNSS Receive Data
TX	O	GNSS Transmit Data
CL	O	IIC Clock
DA	I/O	IIC Data
G	-	Ground

3. Electrical Characteristics

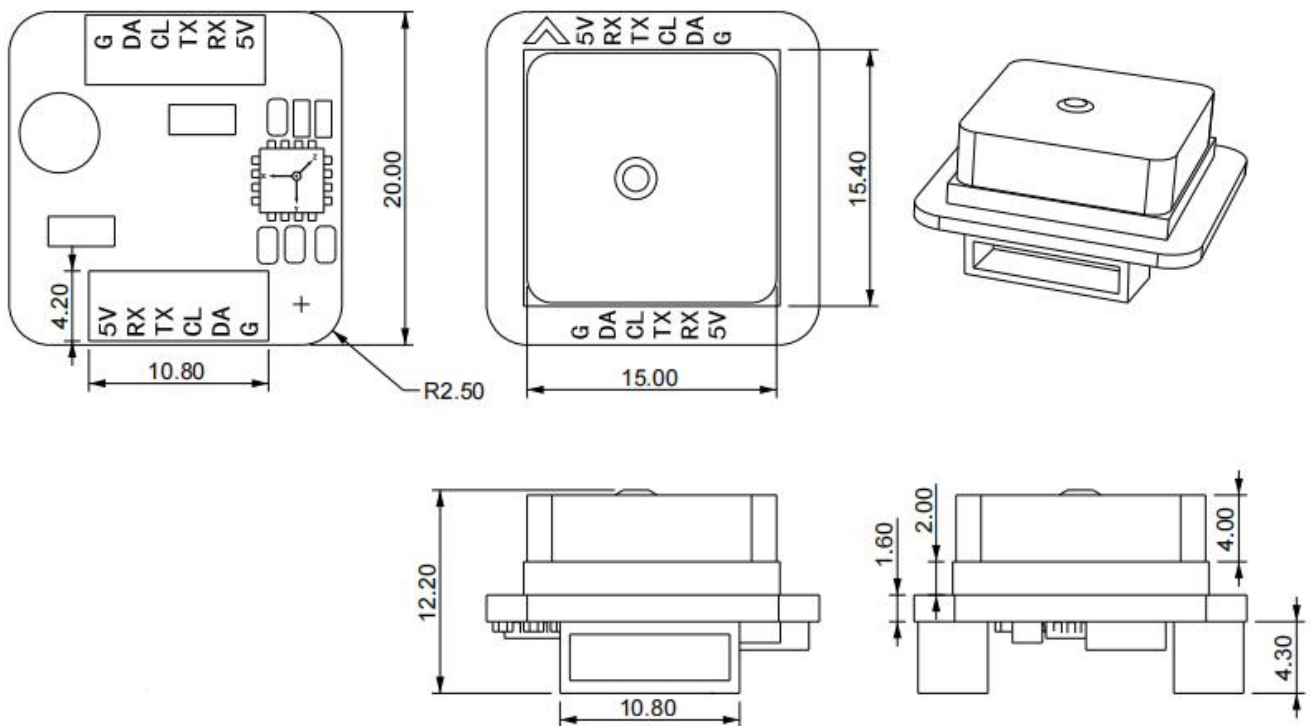
Parameters	Symbol	Min	Typical	Max	Unit
Supply Voltage	VCC	2.8	5.0	5.5	V
Operating Current	Lopr	30@5.0V	34@5.0V	36@5.0V	mA
Backup Power Source			0.07		F
Backup Battery Current	I_BCKP		28@3.3V		uA
Backup Battery Voltage	V_back	1.8		3.6	V
Digital I/O Voltage	Div	2.8		3.3	V

Storage Temperature	Tstg	-40		85	°C
Operating Temperature ¹	Topr	-40		85	°C
Farah capacitance Temp ²	Tstg	-25		60	°C
Humidity				95	%

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

2 Hot start can not be enabled when the temperature is below -20°C or above 60°C

4. Product Dimensions

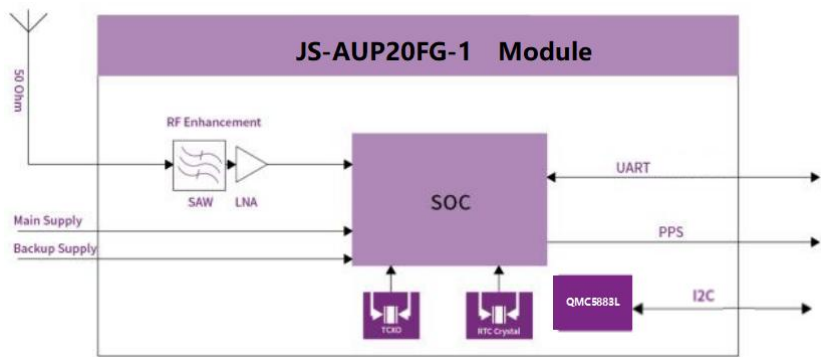


UNIT: mm Dimension error:±0.3mm

5. Interface Configuration Options

5.1 Block Diagram

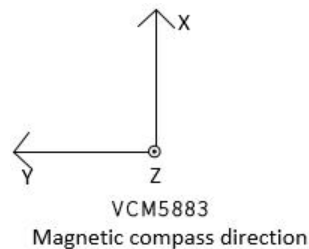
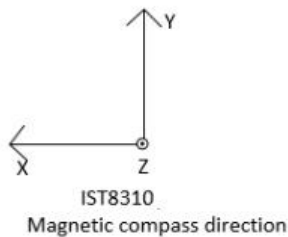
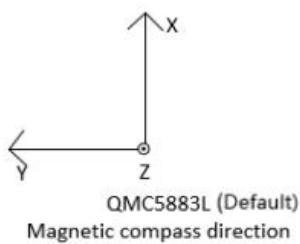
The JS-AUP20FG-1 includes 1 UART port with TTL communication for GNSS data transmission; and IIC communication for geomagnetic data transmission.



5.2 Interface Description

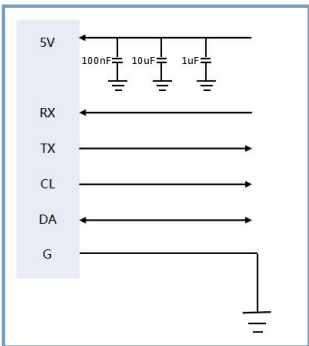
The JS-AUP20FG-1 module can select corresponding additional sensors as needed. The main options are as follows:

Model No.	Flash	QMC5883L (Default)/IST8310/VCM5883
JS-AUP20FG-1(Default)	√	√
JS-AUP20F-1	√	NC



Note: Compass Models:
Default geomagnetic sensor model QMC5883L, QMC5883L_MS_ADDRESS is 0x0D;
Optional geomagnetic sensor model VCM5883, VCM5883_MS_ADDRESS is 0x0C;
Optional geomagnetic sensor model IST8310, IST8310_MS_ADDRESS is 0x0F.

5.3 Application Circuit



6. ROHS

This product is ROHS compliant.