



Accurate
positioning

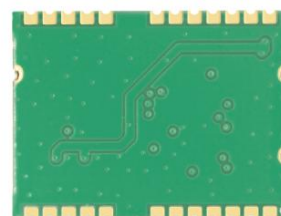
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JS-UP26-1

PRODUCT SPECIFICATION

Data Sheet



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Change History of Revision

Revision	Date	Contents of Revision Change	Remark
V1.0	2022/02/28	First release	Wang Wei

The documentation applies to the following products:

Type	Product model	Description
SMD	JS-UP26-1	
SMD	JS-UP26F-1	Default

1. Functional description

1.1 Overview

The JS-UP26-1 module uses a standard precision GNSS platform to provide superior sensitivity and acquisition time for all L1 GNSS signals. The solution also provides high RF sensitivity to improve dynamic position accuracy in small antennas or non-line-of-sight scenarios. In continuous tracking mode, the extremely low power consumption provides strong power autonomy for all battery-powered devices such as asset trackers without compromising GNSS performance. To obtain maximum sensitivity in the passive antenna design, an LNA and a SAW filter are integrated in the RF path. Supports simultaneous reception of 4 GNSS (GPS, GLONASS, Galileo and Beidou). The large number of visible satellites allows the receiver to select the best signal. This will maximize the availability of the location, especially in challenging conditions, such as difficult signal conditions such as canyons deep in the city also enable reliable positioning.

1.2 Product Features

- SOC high performance GNSS Chips
- Cold start acquisition sensitivity of -148dBm and -166dBm tracking sensitivity
- Up to 10 Hz navigation update rate, single constellation up to 18Hz
- Supports BDS, GPS, QZSS, SBAS, GLONASS, Galileo
- Supports A-GNSS
- Integrated TCXO, LNA, SAW, RTC
- Compact size (16.0mm x 12.2mm x 2.4mm±0.3mm) suitable for space-sensitive application
- Support standard NMEA 0183, UBX

1.3 Performance

Parameter	Specification
Receiver type*	■GPS/QZSS L1C/A ■SBAS EGNOS, GAGAN, MSAS and WAAS ■GLONASS L1OF ■BDS B1I, B1C ■Galileo E1 B/C
Sensitivity ¹	Tracking & Navigation -166dBm Reacquisition -160dBm Hot Start -160dBm Cold Start -148dBm
Time-To-First-Fix ²	Cold Start 29 s Hot Start 1 s
Horizontal Position accuracy ³	Autonomous 2.0 m CEP SBAS 1.5 m CEP
Accuracy of time pulse signal	RMS 30 ns 99% 60 ns
Velocity accuracy ⁴	0.05 m/s
Dynamic heading accuracy ⁴	0.3 deg
Operational limits ⁵	Dynamics ≤ 4 g Altitude 80000 m Velocity 500 m/s
Frequency of time pulse signal	Default 1PPS (0.25 Hz to 10 MHz configurable)
Baud Rate	9,600 -- 921600 bps (Default 38400 bps)
Max navigation update rate	10 Hz (Default 1Hz, configurable)

*Default GPS+Galileo+QZSS+SBAS, BeiDou B1I cannot be enabled simultaneously with BeiDou B1C or GLONASS L1OF

👉₁ Demonstrated with a good external LNA. Measured at room temperature

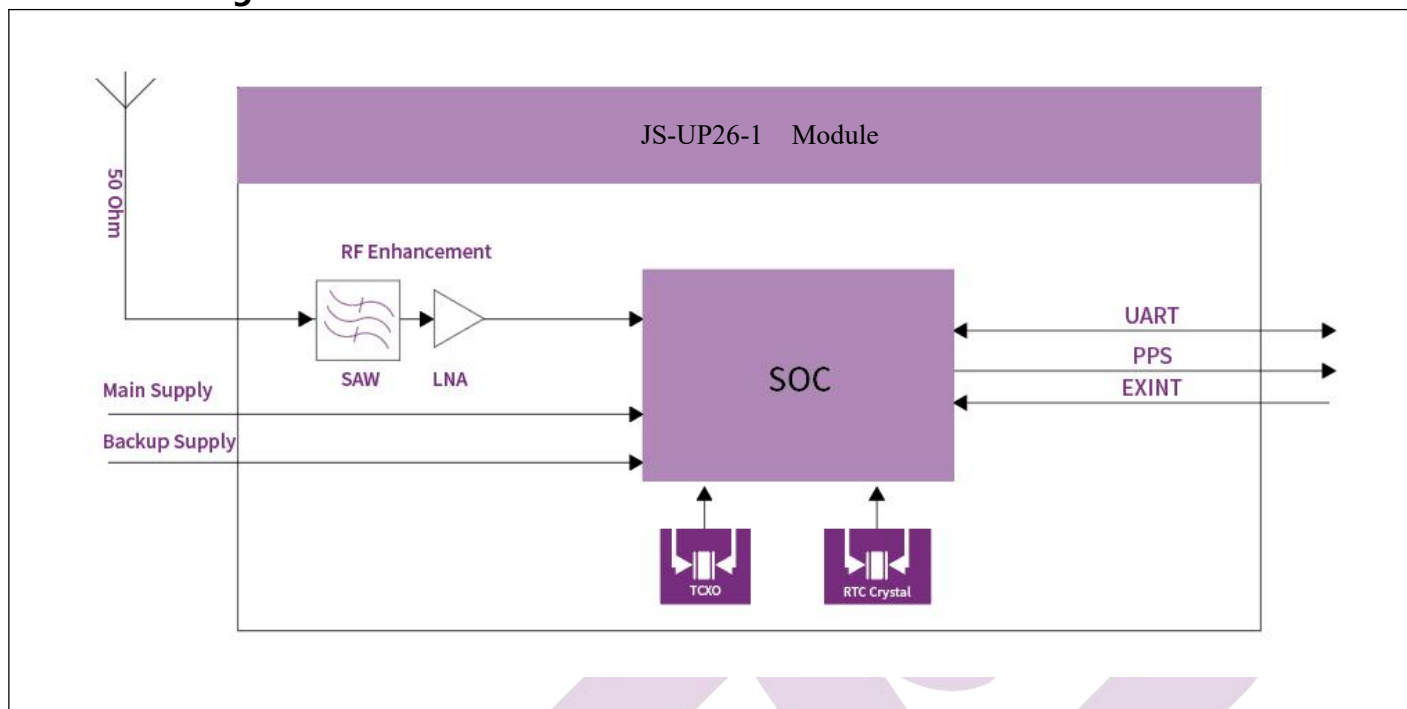
👉₂ All satellites at ≥-130dBm

👉₃ CEP 50%, 24 hours static, -130dBm, > 6SVs

👉₄ 50% at 30 m/s for dynamic operation

👉₅ Assuming Airborne 4g platform

1.4 Block Diagram



1.5 Protocols

Protocol	Type
NMEA 0183, v2.1, 2.3, 4.0, 4.10 and 4.11 (default)	Input/output, ASCII
UBX	Input/output, binary, u-blox proprietary

1.6 Antenna

The JS-UP26-1 module was designed for use with passive and active antennas.

Parameter	Specification
Active Antenna Recommendations	Minimum gain 15 dB (to compensate signal loss in RF cable)
	Maximum gain 30 dB
	Maximum noise figure 1.5 dB

1.7 Product Applications

- UAV
- Automotive application
- AVL and Location-Based services
- Marine navigation, fleet management
- Handheld GPS receiver application
- Intelligent logistics scheduling
- Personnel protective
- Ideal for PDA, pocket PC
- Car navigation and tracking
- Intelligent robot

2 Pin definitions

2.1 Pin assignment

13	GND	GND	12
14	RESERVED	RF_IN	11
15	RESERVED	GND	10
16	RESERVED	VCC_RF	9
17	RESERVED	RESET_N	8
18	RESERVED	RESERVED	7
19	RESERVED	RESERVED	6
20	TXD	RESERVED	5
21	RXD	EXTINT	4
22	VBAT	TIMEPULSE	3
23	VCC	RESERVED	2
24	GND	BOOT_N	1

No.	Name	I/O	Description
1	BOOT_N	I	Internal event interrupts the pin (keep open if not used)
2,5,6,7,14,15,16,17,18,19	RESERVED	-	--
3	TIMEPULSE	O	Time Pulse (keep open if not used)
4	EXTINT	I	External Interrupt (keep open if not used)
8	RESET_N	I	System reset (active low). Has to be low for at least 1 ms to trigger a reset (keep open if not used)
9	VCC_RF	O	Output voltage RF section
10,12,13,24	GND	-	Ground
11	RF_IN	I	GNSS Signal Input
20	TXD	O	TTL output (keep open if not used)
21	RXD	I	TTL Input (keep open if not used)
22	VBAT	I	Backup voltage supply
23	VCC	I	Main voltage supply

3. Electrical Specifications

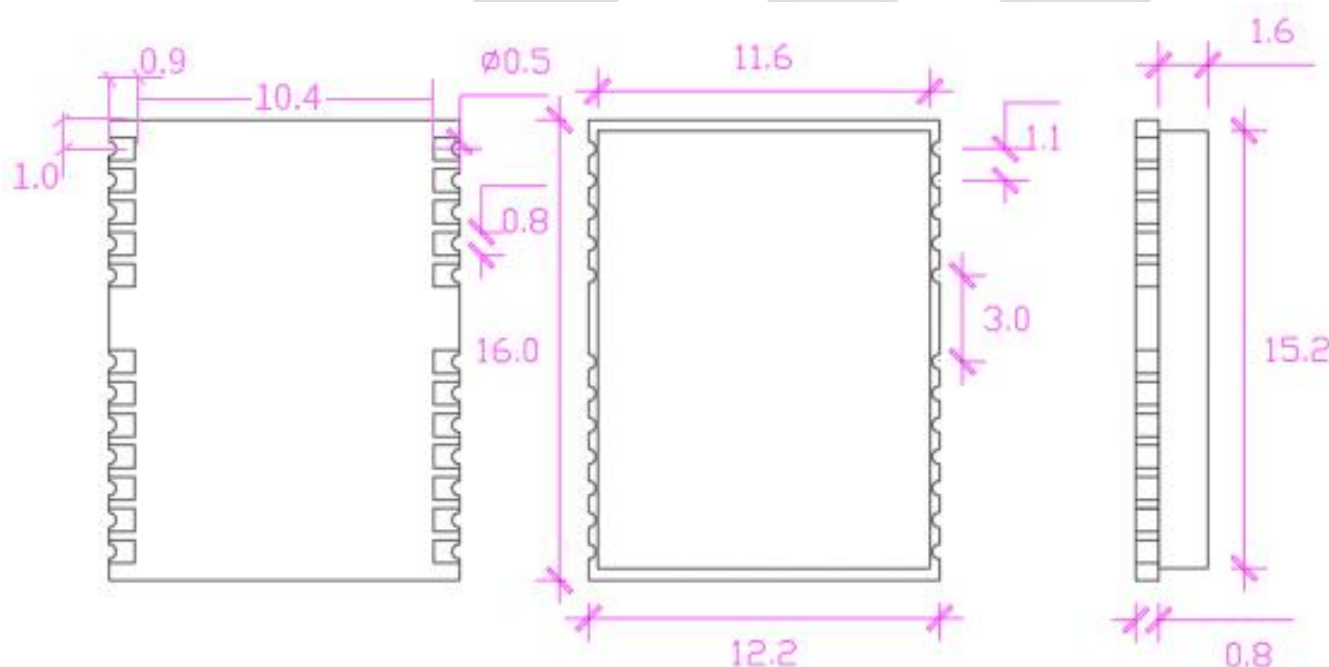
Parameter	Symbol	Min	Type	Max	Units
Power supply voltage	VCC	2.6	3.3	3.6	V

Average supply current	Acquisition	25@3.3V	28@3.3V	30@3.3V	mA
	Tracking	23@3.3V	25@3.3V	28@3.3V	mA
Backup battery voltage	V_BCKP	1.8		3.6	V
Backup battery current	I_BCKP		28(@3.3V)		uA
Digital IO voltage	Div	2.6		3.6	V
Storage temperature	Tstg	-40		85	°C
Operating temperature	Topr	-40		85	°C
Humidity				95	%

*These values are only provided to the customer information as a typical current demand example. They use cold start commands to characterize the samples. Actual power requirements depend on firmware version used, external circuitry, number of satellite tracks, signal strength, type and start time, duration, internal amplifier gain mode, and test conditions.

*The inrush current at startup can reach 100 mA. Ensure that the external power supply output power reaches 100ma.

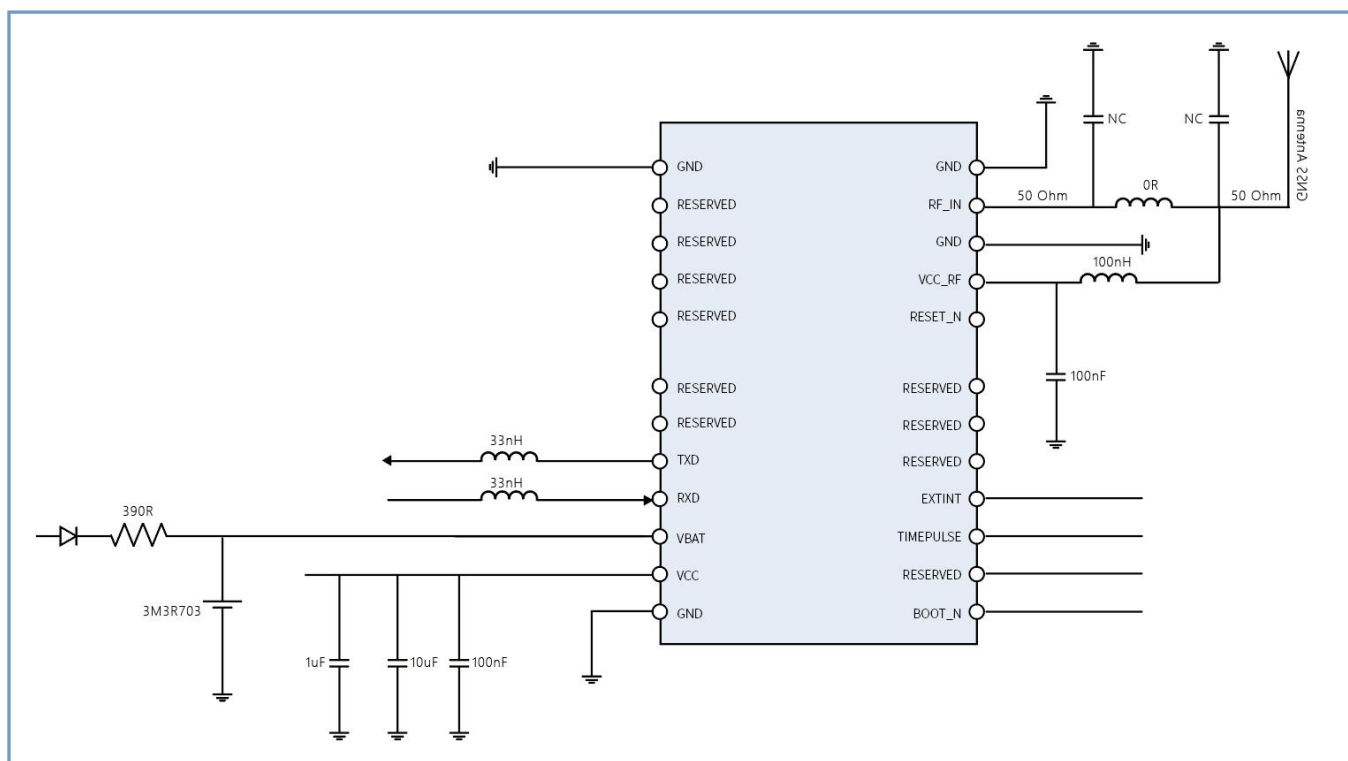
4. Mechanical Specifications



Units: mm

Dimension error : ± 0.3 mm

5. Application Circuit



6. RoHS

This product is RoHS compliance

7. Recommended Reflow Profile (If need)

7.1 GNSS module before the SMT note:

- 7.1.1 When customers Open stencil must be sure the hole bigger to the GNSS module plate, please press 1 to 1 and 0.7 mm is widened to open outward, the thickness of 0.12 mm.
- 7.1.2 Can't get the GNSS module bare hands when needs, must we wear the gloves and static ring.
- 7.1.3 The furnace temperature according to the size of the customer the main board, generally like to stick on a tablet standard temperature of 250 + - 5, can do 260 + - 5.

7.2 Storage and use GNSS module control should pay attention to the following matters:

- 7.2.1 Storage life: 12 months. Storage conditions: <40°C. Relative humidity: <90%R.H.
- 7.2.2 After this bag is opened, devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing must be.
- 7.2.3 Check the humidity card: stored at ≤20%RH.If: 30%~40%(pink)or greater than 40%(red). Labeling

module has moisture absorption.

7.2.4 Mounted within 168 hours at factory conditions of: $t \leq 30^{\circ}\text{C}$, $\leq 60\%\text{R.H.}$

7.2.5 Once opened, the preservation of life in the workshop is 168 hours.

7.3 If baking is required, devices may be baked for:

7.3.1 Modules must be to remove module moisture problem.

7.3.2 Baking temperature: 125°C , 8 hours.

7.3.3 After baking, put the proper amount of desiccant to seal packages.

7.4 The actual number of module vacuum packing which is based on the actual number of packages to the customer requirements.

7.5 Module reel packaging items as follows.

7.5.1 Storage life: 12 months. Storage conditions: $< 40^{\circ}\text{C}$. Relative humidity: $< 90\%\text{R.H.}$

7.5.2 Module apart packing after 168 hours, To launch patch need to bake, to remove the module hygroscopic, baking temperature conditions: 125°C , 8hours.

7.5.3 The actual number of module reel packing which is based on the actual number of packages to the customer requirements.

7.6 Module pallet packaging items as follows:

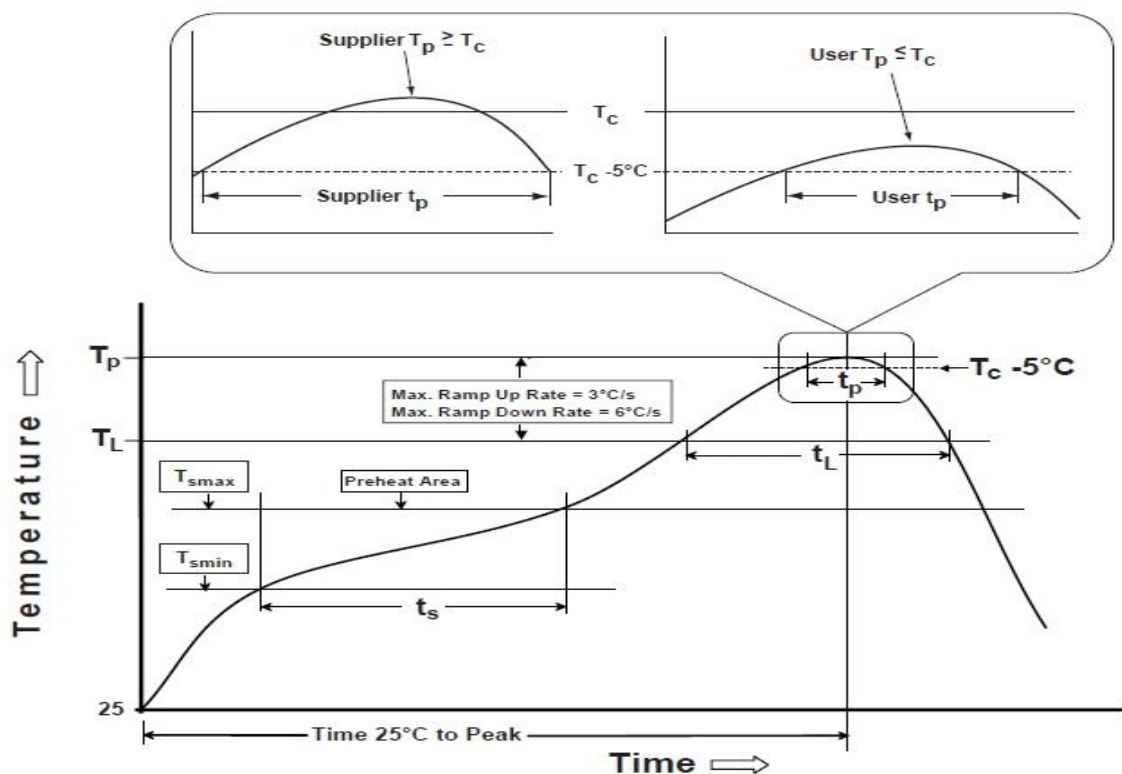
7.6.1 Storage life: 3 months. Storage conditions: $< 40^{\circ}\text{C}$. Relative humidity: $< 90\%\text{R.H.}$

7.6.2 Module if not used within 48 hours, before launching the need for baking, baking temperature: 125°C , 8 hours.

7.6.3 Pallet packaging each plate is 100 PCS. The actual number of module pallet packing which is based on the actual number of packages to the customer requirements.

7.6.4 Pb-Free Process-Classification Temperatures(T_a)

Package Thickness	Volume mm^3 < 350	Volume mm^3 350 - 2000	Volume mm^3 > 2000
$< 1.6 \text{ mm}$	260° C	260° C	260° C
1.6mm - 25 mm	260° C	250° C	245° C
$> 2.5 \text{ mm}$	250° C	245° C	245° C



Profile Feature	Pb-Free Assembly
Preheat/Soak	
Temperature Min (T_{smin})	150 °C
Temperature Max (T_{smax})	200 °C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds
Rise speed rate (T_L to T_P)	3°C/second max.
Liquidous temperature (T_L)	217 °C
Time (t_L) maintained above T_L	60-150 seconds
Encapsulated peak temperature (T_P)	Cannot exceed T_c ($T_c=260^\circ\text{C}$)
Time(t_p)* within 5°C of the specified classification temperature (T_c)	30* seconds
Rate of decline (T_P to T_L)	6°C/ second max
Time 25 °C to peak temperature	8 minutes max
*Tolerance for peak profile temperature (T_P) is defined as a supplier minimum and a user maximum.	

* The time above 255°C should not exceed 30 seconds