



HARDWARE

REFERENCE DESIGN

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UM621 Series

Multi-GNSS Dual-frequency
Integrated Positioning Module

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Revision History

Version	Revision History	Date
R1.0	First release	Oct. 2022
R1.1	Optimize the description of antenna power supply; Add Chapter 3 Power Supply Requirements	Apr. 2023
R2.0	Expand the document scope: applicable to UM621 series	Sept. 2023
R2.1	Modify the voltage range of V_BCKP; Add the voltage requirements of VCC and V_BCKP for the module that supports wake-on-motion	Feb. 2024

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UM621 Series Hardware Reference Design

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2 Reference Circuit Using a Passive Antenna

- When using a passive antenna, a low noise amplifier should be added between the antenna and the RF_IN of the module in order to ensure the performance of the system.
- For the RF routing (antenna → LNA → RF_IN), note the 50 Ω impedance matching
- For the voltage range of V_BCKP, see Chapter 3: Power Supply Requirements
- Requirements for the odometer speed pulse: width ≥ 100 μs, frequency ≤ 5 KHz

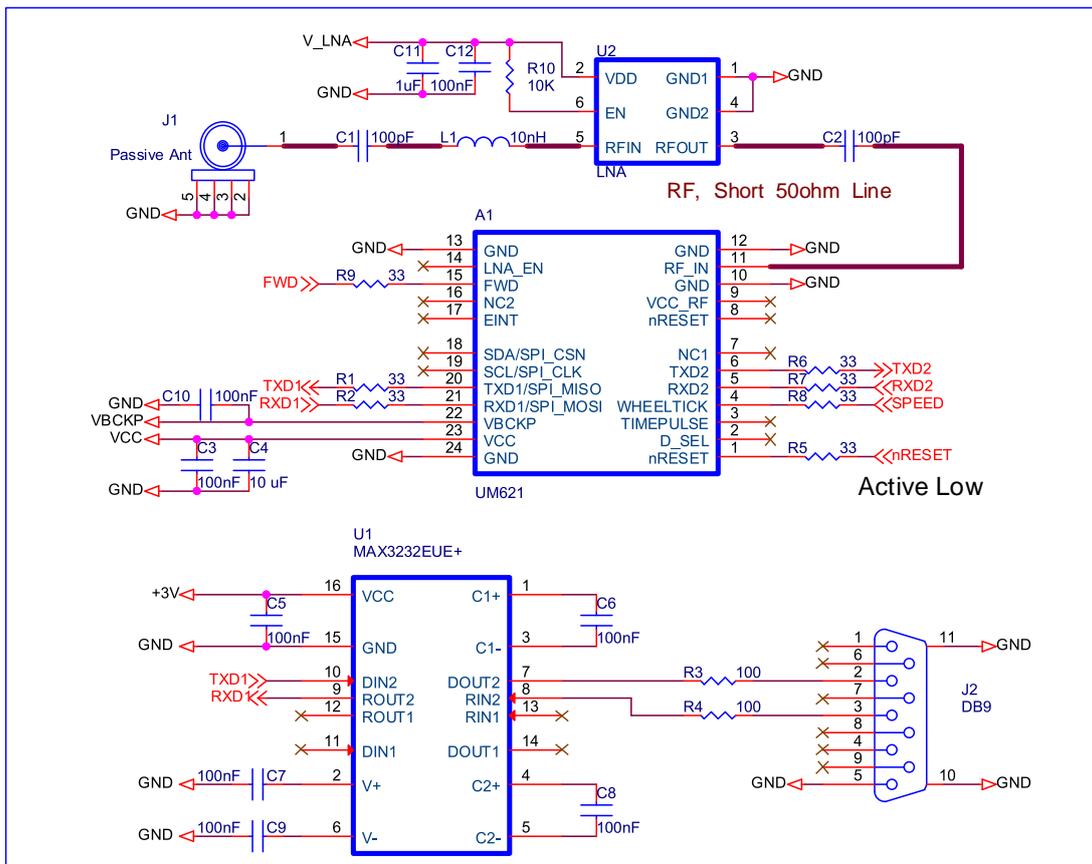


Figure 2-1 Reference Circuit Using a Passive Antenna

3 Power Supply Requirements

3.1 Main Supply (VCC)

- For the module that does not support wake-on-motion, the voltage range of VCC is 2.7 V ~ 3.6 V.
- For the module that supports wake-on-motion, the voltage range of VCC is 3.0 V ~ 3.6 V.

Notes:

- The VCC initial level when power-on should be less than 0.4 V.
- The VCC ramp when power-on should be monotonic, without plateaus.
- The voltages of undershoot and ringing should be within 5% VCC.
- VCC power-on waveform: The time interval from 10% rising to 90% must be within 100 μ s ~ 10 ms.
- Power-on time interval: The time interval between the power-off (VCC < 0.4 V) to the next power-on is recommended to be larger than 500 ms.

3.2 Backup Supply (V_BCKP)

When using hot start, users should supply backup power to the module.

- For the module that does not support wake-on-motion, the voltage range of V_BCKP is 2.0 V ~ 3.6 V.
- For the module that supports wake-on-motion, the voltage range of V_BCKP is 3.0V ~ 3.6 V. Meanwhile, ensure that the voltage at V_BCKP is lower than that at VCC.

Notes:

- The V_BCKP initial level when power-on should be less than 0.4 V.
- The V_BCKP ramp when power-on should be monotonic, without plateaus.
- The voltages of undershoot and ringing should be within 5% V_BCKP.
- V_BCKP power-on waveform: The time interval from 10% rising to 90% must be within 100 μ s ~ 10 ms.
- Power-on time interval: The time interval between the power-off (V_BCKP < 0.4 V) to the next power-on is recommended to be larger than 500 ms.
- The V_BCKP pin cannot be floating or connected to ground. When V_BCKP is not used, it should be connected to VCC or connected to backup power.

4 Recommended BOM

	Component	Order No.	Manufacturer
U1	RS-232 Transceivers	MAX3232EUE+	TI
U2	LNA	MXDLN14TP	MAXSCEND

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