



HARDWARE

REFERENCE DESIGN

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# UM620 Series

Multi-GNSS Dual-frequency  
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 UM620 series	Sept. 2023
R2.1	Modify the voltage range of V_BCKP	Feb. 2024

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# 1 Reference Circuit Using an Active Antenna

- The supply voltage for VCC is 2.7 V ~ 3.6 V
- Ground all GND pins of the module
- Connect the RF\_IN signal to the antenna and note the 50 Ω impedance matching
- Feed the antenna with an external power supply

If the antenna power supply and the module's main supply VCC use the same power rail, the ESD, surge and overvoltage from the antenna will have an effect on VCC, which may cause damage to the module. Therefore, it's recommended to design an independent power rail for the antenna to reduce the possibility of damage to the module.

- The supply voltage for VBCKP is 2.0 V ~ 3.6 V

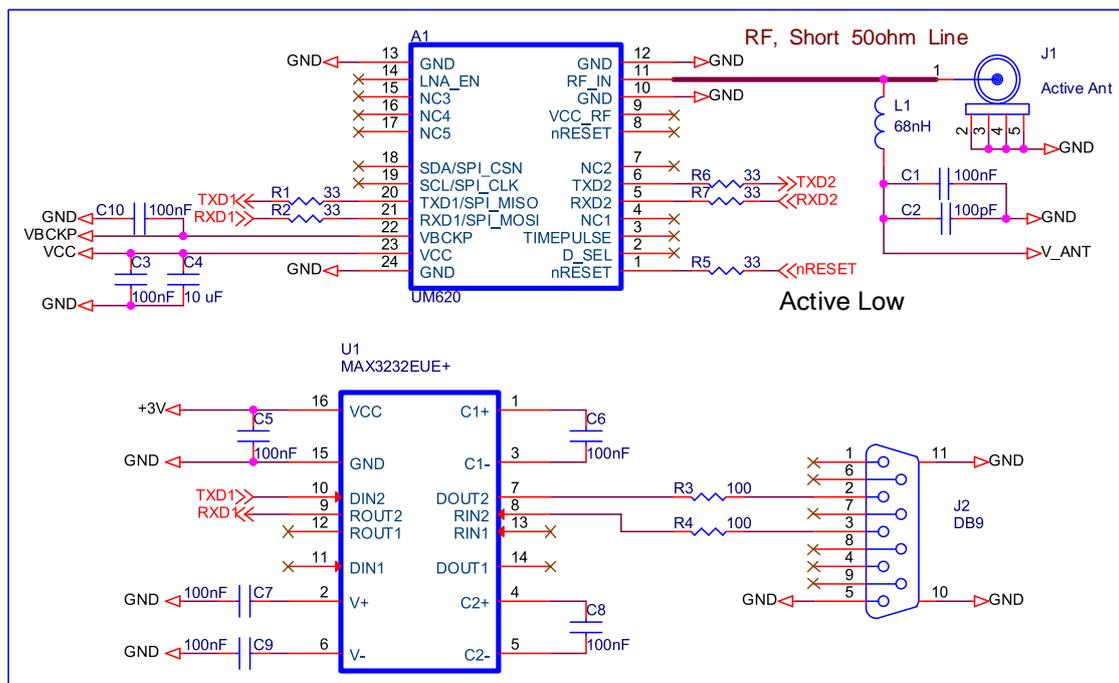


Figure 1-1 Reference Circuit Using an Active Antenna

## 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
- The supply voltage for VBCKP is 2.0 V ~ 3.6 V

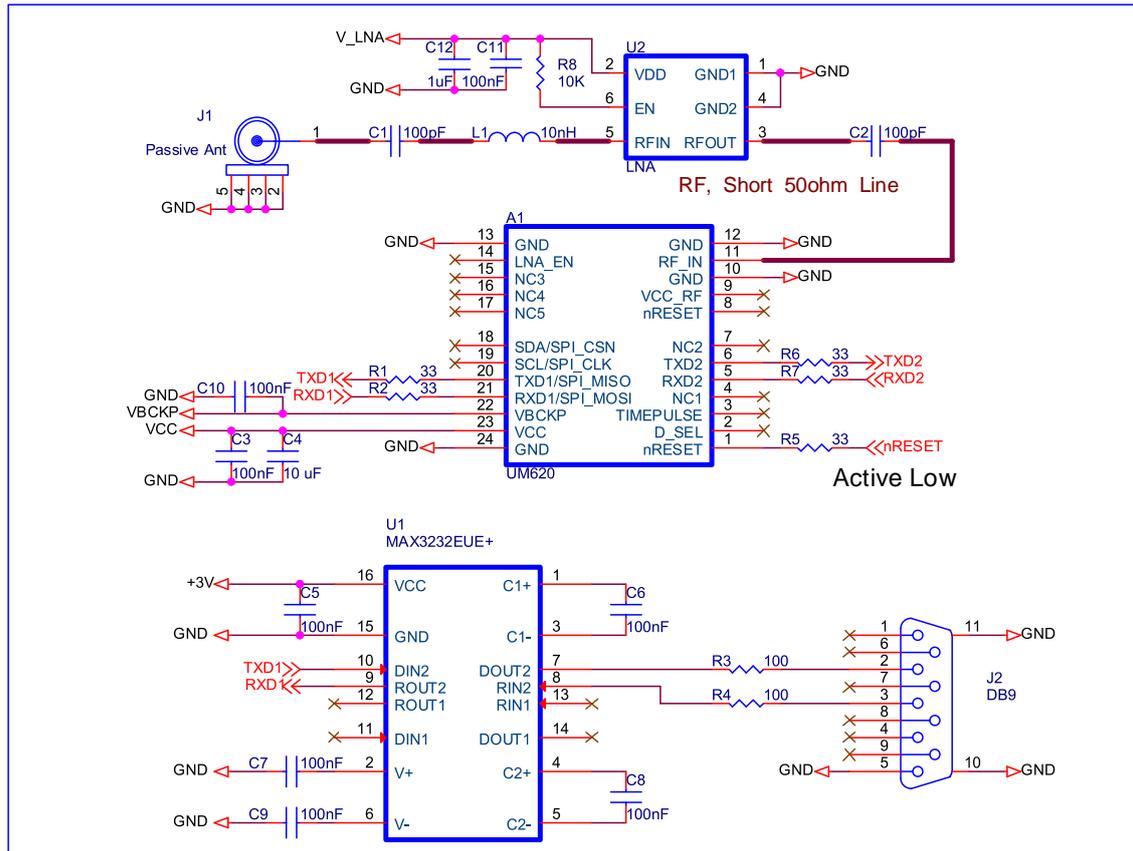


Figure 2-1 Reference Circuit Using a Passive Antenna

## 3 Power Supply Requirements

### 3.1 Main Supply (VCC)

The voltage range of VCC is 2.7 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  $\mu$ 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. The voltage range of V\_BCKP is 2.0 V ~ 3.6 V.

**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  $\mu$ 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
<b>U1</b>	RS-232 Transceivers	TRS3122ERGER	TI
<b>U2</b>	LNA	MXDLN14TP	MAXSCEND

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