

L76C Reference Design

GNSS Module Series

Rev. L76C_Reference_Design_Rev.A

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Status: Released



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Quectel Wireless Solutions Co., Ltd.

7th Floor, Hongye Building, No.1801 Hongmei Road, Xuhui District, Shanghai 200233, China

Tel: +86 21 5108 6236

Email: info@quectel.com

Or our local office. For more information, please visit:

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About the Document

History

Revision	Date	Author	Description
A	2018-07-30	Brooke WANG	Initial

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1 Reference Design

1.1. Introduction

This document provides the reference designs for Quectel L76C module.

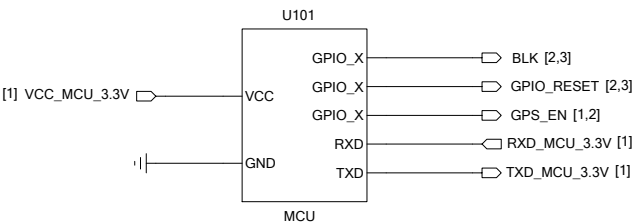
1.2. Schematics

These schematics illustrated in the following pages are provided for your reference only.

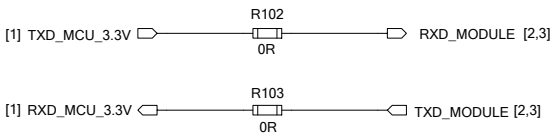
3.3V Power Supply and UART Circuit

If the MCU power supply is 3.3V, please refer to the reference designs as below.

Customer's MCU

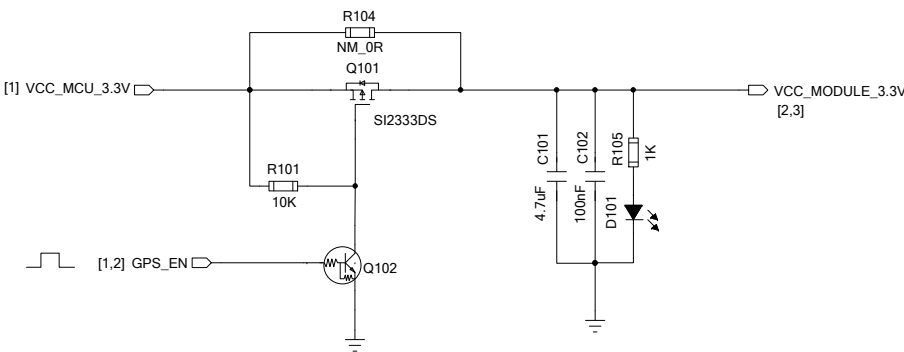


UART Circuit



Note:
R102 and R103 are reserved for debugging the waveform of UART.

Power Management Circuit (Optional)



Note:
Cutting off VCC_MODULE_3.3V and keeping V_BCKP powered will turn the module into backup mode from full on mode. As soon as the VCC pin is powered, the module will enter into full on mode immediately. In the case of power management, Q101, Q102 and R101 should be mounted, while R104 should not be mounted.

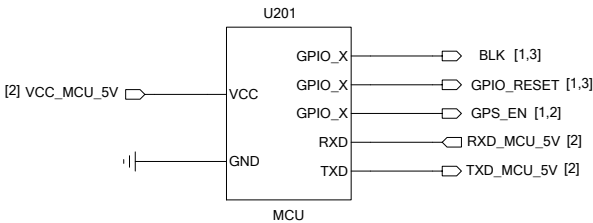
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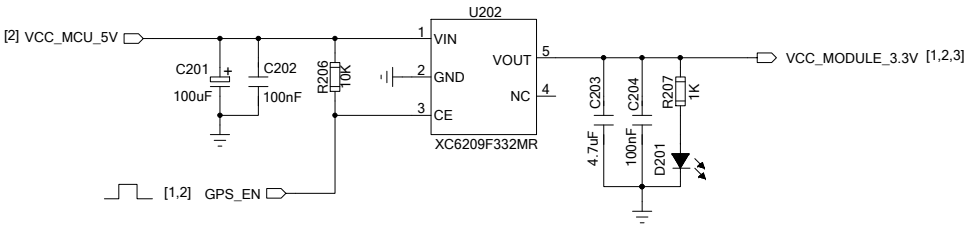
5.0V Power Supply and UART Circuit

If the MCU power supply is 5.0V, please refer to the reference designs as below.

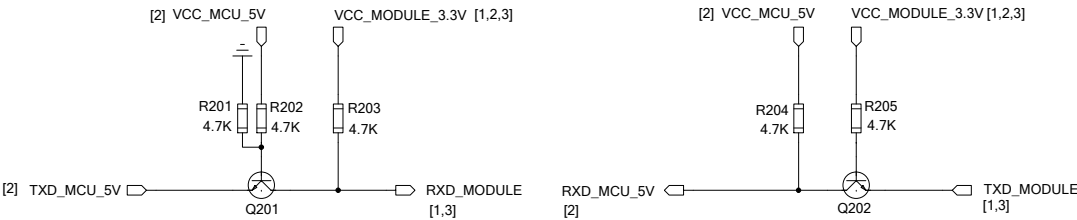
Customer's MCU



LDO Circuit



Level Shifting for UART



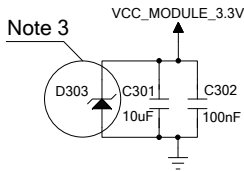
Note:
The transistor circuit will realize the voltage level shifting between VCC_MCU_5V and VCC_MODULE_3.3V.

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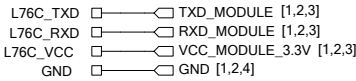
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Module Interfaces

Module Interfaces

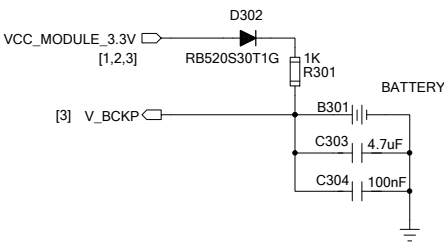


Test Points



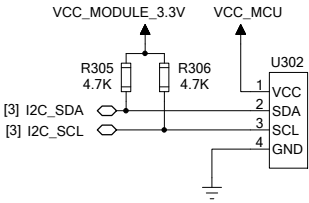
- Notes:
1. UART port is used for NMEA output, UNICORE/PQ command input and firmware upgrade.
 2. The test points are reserved for debugging the GNSS module.
 3. It is recommended to add a TVS near the VCC.
 4. R304 and R308 are not mounted by default. If BLK pin needs to be used, then R304 should be mounted for 3.3V MCU, while R304 and R308 should be mounted for 5.0V MCU. For more details, please refer to *Quectel_L76C_Hardware_Design*.

Charge Circuit for RTC Logic



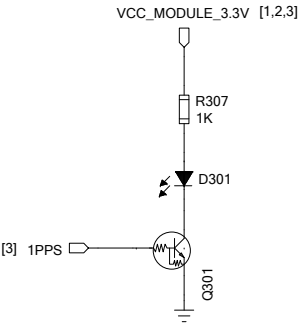
Note:
V_BCKP is designed to supply power for L76C's RTC logic circuit when VCC_MODULE_3.3V is powered off.

I2C Circuit for L76C



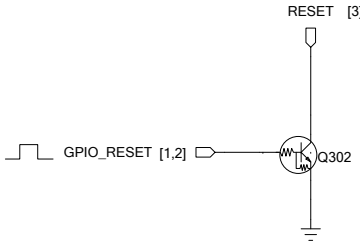
- Notes:
1. In L76C, SDA and SCL should be pulled up to VCC_MODULE_3.3V via an external pull-up resistor.
 2. For more details, please refer to *Quectel_L76C_Hardware_Design*.

Indicating Circuit for 1PPS



Note:
The 1PPS indicator will blink at 1Hz frequency after the module fixes the position.

Reset Circuit



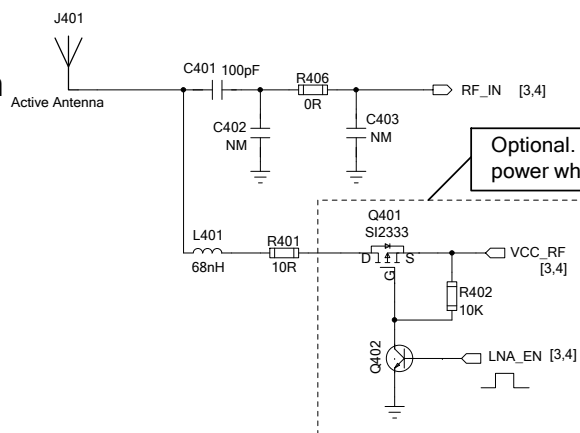
Note:
If the reset function is unused, the RESET pin can be left unconnected.

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Antenna Interface

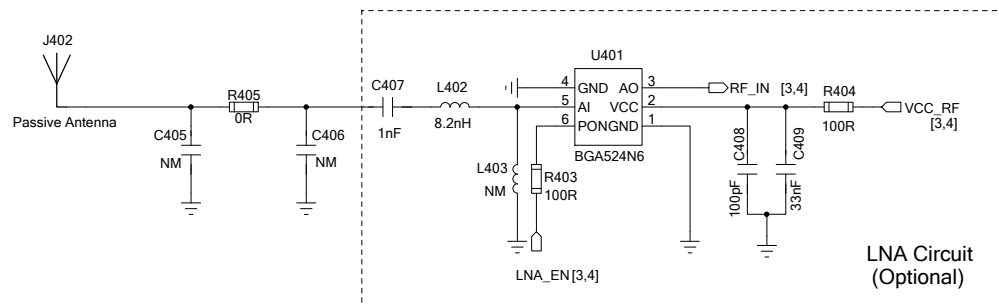
Active Antenna



Notes:

1. The PI type circuit (C401, C402, C403, R406) is reserved for antenna impedance matching. By default, C402 and C403 are not mounted; C401 is 100pF, R406 is 0Ω.
2. The impedance of RF trace should be controlled as 50Ω and the trace length should be kept as short as possible.
3. For more details, please refer to *Quectel_L76C_Hardware_Design*.

Passive Antenna



Notes:

1. The PI type circuit (R405, C405, C406) is reserved for antenna impedance matching. By default, C405 and C406 are not mounted; R405 is 0Ω.
2. If an external LNA is added between the passive antenna and L76C module, the total sensitivity will be improved by about 3dB, which is beneficial for improving TTFF.
3. One typical reference circuit with BGA524N6 is given in the left figure. Here, C407, L402 and L403 form a reserved matching circuit for the LNA BGA524N6. By default, C407 is 1nF, L402 is 8.2nH, and L403 is not mounted.
4. LNA_EN is used to control whether an external LNA is enabled, and the pin function is optional. If LNA_EN function is not used, please connect the pin LNA_EN to VCC to keep LNA always ON.
5. The impedance of RF trace should be controlled as 50Ω and the trace length should be kept as short as possible.
6. For more details, please refer to *Quectel_L76C_Hardware_Design*.

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