

LG69T (AA,AD)

Reference Design

GNSS Module Series

Version: 1.0.0

Date: 2021-10-09

Status: Preliminary



At Quectel, our aim is to provide timely and comprehensive services to our customers. If you require any assistance, please contact our headquarters:

Quectel Wireless Solutions Co., Ltd.

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China

Tel: +86 21 5108 6236

Email: info@quectel.com

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

<http://www.quectel.com/support/sales.htm>.

For technical support, or to report documentation errors, please visit:

<http://www.quectel.com/support/technical.htm>.

Or email us at: support@quectel.com.

Legal Notices

We offer information as a service to you. The provided information is based on your requirements and we make every effort to ensure its quality. You agree that you are responsible for using independent analysis and evaluation in designing intended products, and we provide reference designs for illustrative purposes only. Before using any hardware, software or service guided by this document, please read this notice carefully. Even though we employ commercially reasonable efforts to provide the best possible experience, you hereby acknowledge and agree that this document and related services hereunder are provided to you on an “as available” basis. We may revise or restate this document from time to time at our sole discretion without any prior notice to you.

Use and Disclosure Restrictions

License Agreements

Documents and information provided by us shall be kept confidential, unless specific permission is granted. They shall not be accessed or used for any purpose except as expressly provided herein.

Copyright

Our and third-party products hereunder may contain copyrighted material. Such copyrighted material shall not be copied, reproduced, distributed, merged, published, translated, or modified without prior written consent. We and the third party have exclusive rights over copyrighted material. No license shall be granted or conveyed under any patents, copyrights, trademarks, or service mark rights. To avoid ambiguities, purchasing in any form cannot be deemed as granting a license other than the normal non-exclusive, royalty-free license to use the material. We reserve the right to take legal action for noncompliance with abovementioned requirements, unauthorized use, or other illegal or malicious use of the material.

Trademarks

Except as otherwise set forth herein, nothing in this document shall be construed as conferring any rights to use any trademark, trade name or name, abbreviation, or counterfeit product thereof owned by Quectel or any third party in advertising, publicity, or other aspects.

Third-Party Rights

This document may refer to hardware, software and/or documentation owned by one or more third parties (“third-party materials”). Use of such third-party materials shall be governed by all restrictions and obligations applicable thereto.

We make no warranty or representation, either express or implied, regarding the third-party materials, including but not limited to any implied or statutory, warranties of merchantability or fitness for a particular purpose, quiet enjoyment, system integration, information accuracy, and non-infringement of any third-party intellectual property rights with regard to the licensed technology or use thereof. Nothing herein constitutes a representation or warranty by us to either develop, enhance, modify, distribute, market, sell, offer for sale, or otherwise maintain production of any our products or any other hardware, software, device, tool, information, or product. We moreover disclaim any and all warranties arising from the course of dealing or usage of trade.

Disclaimer

- a) We acknowledge no liability for any injury or damage arising from the reliance upon the information.
- b) We shall bear no liability resulting from any inaccuracies or omissions, or from the use of the information contained herein.
- c) While we have made every effort to ensure that the functions and features under development are free from errors, it is possible that they could contain errors, inaccuracies, and omissions. Unless otherwise provided by valid agreement, we make no warranties of any kind, either implied or express, and exclude all liability for any loss or damage suffered in connection with the use of features and functions under development, to the maximum extent permitted by law, regardless of whether such loss or damage may have been foreseeable.
- d) We are not responsible for the accessibility, safety, accuracy, availability, legality, or completeness of information, advertising, commercial offers, products, services, and materials on third-party websites and third-party resources.

Copyright © Quectel Wireless Solutions Co., Ltd. 2021. All rights reserved.

About the Document

Document Information

Title	LG69T (AA,AD) Reference Design
--------------	---------------------------------------

Subtitle	GNSS Module Series
-----------------	--------------------

Document Type	Reference Design
----------------------	------------------

Document Status	Preliminary
------------------------	-------------

Revision History

Version	Date	Description
-	2021-08-27	Creation of the document
1.0.0	2021-10-09	Preliminary

Contents

About the Document	3
Contents	4
1 Reference Design.....	5
1.1. Introduction	5
1.2. Schematics.....	5

1 Reference Design

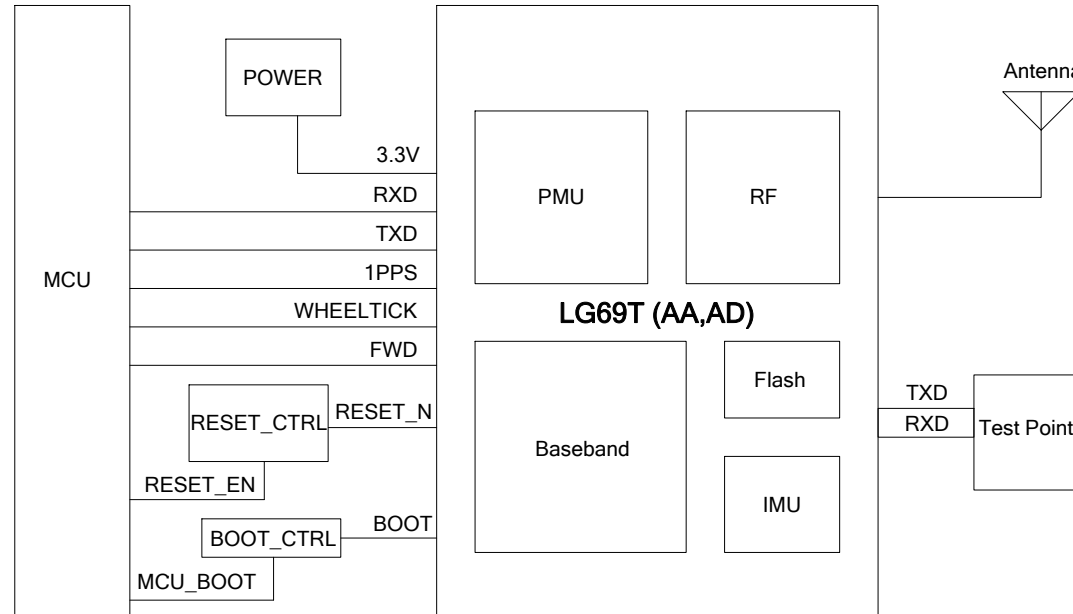
1.1. Introduction

This document provides the reference design of Quectel LG69T (AA) and LG69T (AD) GNSS modules, including the design of block diagram, power supply, MCU interface, module interfaces, and antenna interface.

1.2. Schematics

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

Block Diagram



NOTE:
The LG69T (AD) module does not use IMU.

Quectel Wireless Solutions		
DRAWN BY Brady WANG/Phil GAO	PROJECT LG69T (AA,AD)	TITLE Reference Design
CHECKED BY Storm BAO	SIZE A2	VER 1.0.0
SHEET	1 OF 5	DATE 2021/10/9

6

5

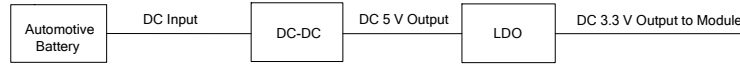
4

3

2

1

Power Supply



NOTE:

It is recommended to choose a low noise LDO with a minimum output current of 1 A.

Quectel Wireless Solutions

DRAWN BY Brady WANG/Phil GAO	PROJECT LG69T (AA,AD)	TITLE Reference Design
CHECKED BY Storm BAO	SIZE A2	VER 1.0.0
SHEET	2 OF 5	DATE 2021/10/9

6

5

4

3

2

1

D

D

C

C

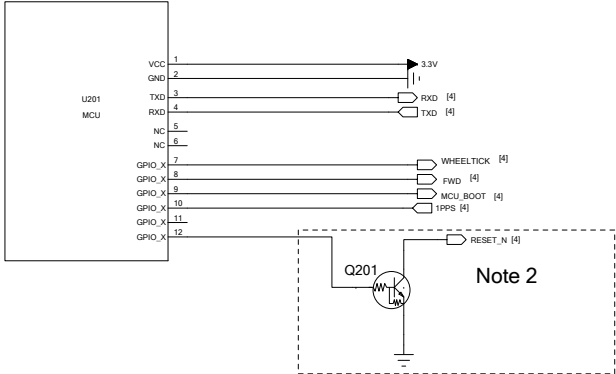
B

B

A

A

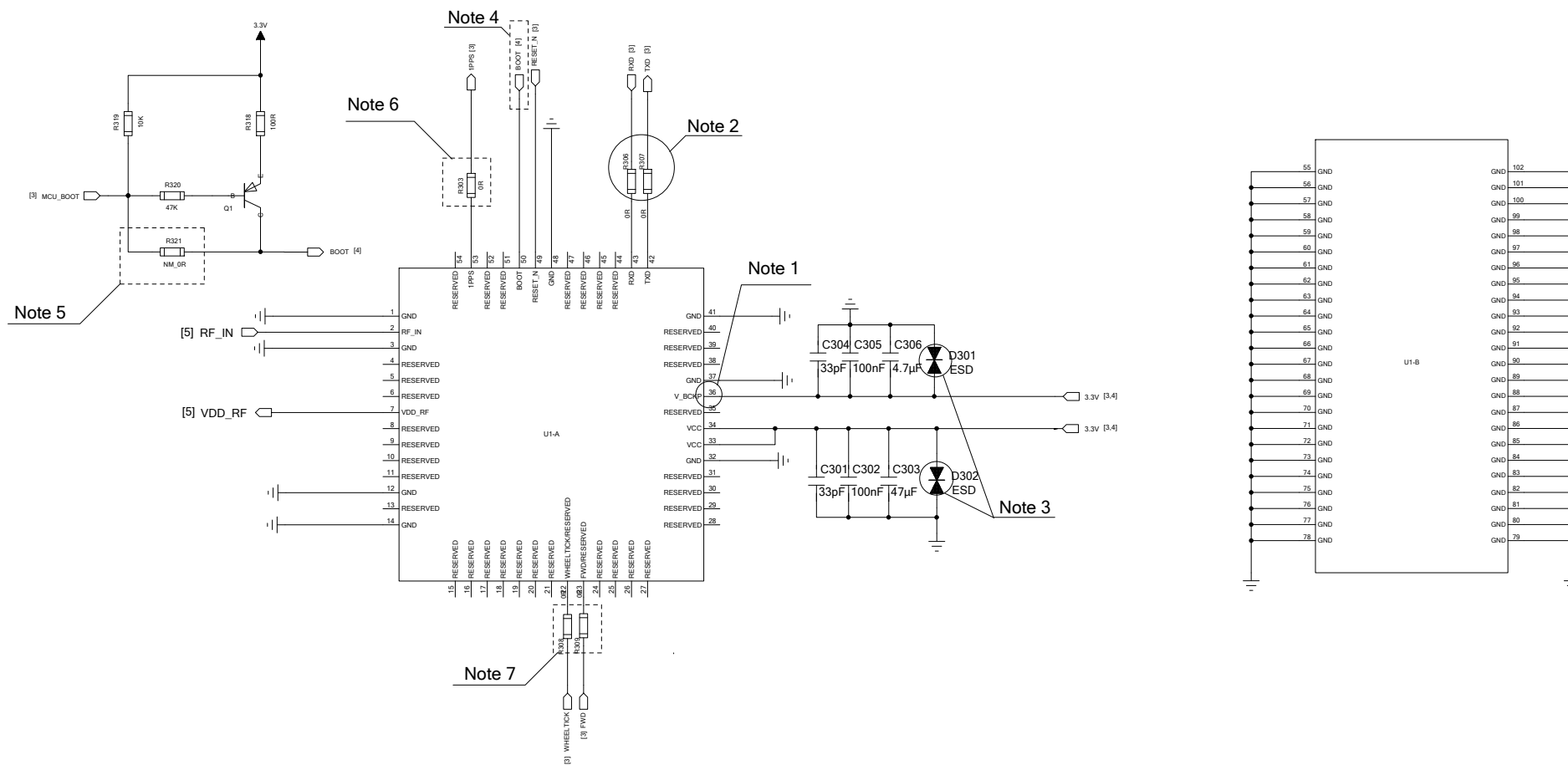
MCU Interfaces



- NOTE:**
1. U201 represents an MCU. The power domain of GPIO interfaces of the MCU is 3.3 V.
 2. An OC driver circuit is recommended here.

Quectel Wireless Solutions		
DRAWN BY Brady WANG/Phil GAO	PROJECT LG69T (AA,AD)	TITLE Reference Design
CHECKED BY Storm BAO	SIZE A2	VER 1.0.0
SHEET	3 OF 5	DATE 2021/10/9

Module Interfaces



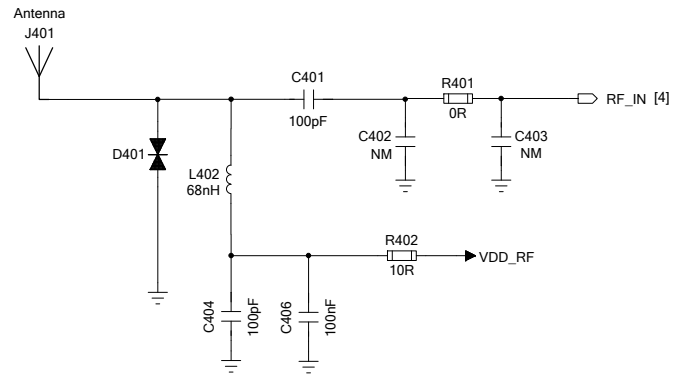
NOTE:

1. V_BCKP must be connected to power supply for startup, and it should be always powered if hot (warm) start is needed.
2. UART port is used for NMEA output and firmware upgrade by default.
3. D301 and D302 are ESD protection devices, which are recommended to be placed near the VCC.
4. While the pin is kept at high level for about 100 ms during startup, the module enters host mode.
5. NM components are designed to be compatible with other models of LG69T module.
6. All 0R resistors on signal lines are used for debugging and should be placed close to the module.
7. Pin 22 and 23 are used as WHEELTICK and FWD pins for LG69T (AA) and are RESERVED pins for LG69T (AD).
8. Keep all RESERVED and unused pins unconnected, and ensure all GND pins are connected to the ground network.

Quectel Wireless Solutions		
DRAWN BY Brady WANG/Phil GAO	PROJECT LG69T (AA,AD)	TITLE Reference Design
CHECKED BY Storm BAO	SIZE A2	VER 1.0.0
SHEET 4 OF 5	DATE 2021/10/9	

Antenna Interface

Active Antenna



NOTE:

1. It is recommended to use an active antenna with proper parameters.
2. The PI type circuit (C402, C403, and R401) is reserved for antenna impedance matching. By default, C402 and C403 are not mounted and R401 is 0 Ω .
3. The impedance of RF trace should be controlled as 50 Ω and the trace length should be kept as short as possible.
4. For more information, see *Quectel_LG69T(AA,AD)_Hardware_Design*.

Quectel Wireless Solutions

DRAWN BY Brady WANG/Phil GAO	PROJECT LG69T (AA,AD)	TITLE Reference Design
CHECKED BY Storm BAO	SIZE A2	VER 1.0.0
SHEET	5 OF 5	DATE 2021/10/9