LILYGO T-A7670G R2

LILYGO T-A7670G R2 4G LTE CAT1 SIM Module ESP32 TTGO Development Board User Manual

1. Introduction

The LILYGO T-A7670G R2 is a versatile development board integrating an ESP32 microcontroller with a SIMCOM A7670G 4G LTE CAT1 module. This board supports GSM/GPRS/Edge communication, includes a TF card slot, and features GPS capabilities (for the A7670G variant). It is designed for IoT applications requiring cellular connectivity and location services. This manual provides essential information for setting up, operating, and maintaining your development board.

2. Product Overview

The LILYGO T-A7670G R2 board combines an ESP32 for processing and Wi-Fi/Bluetooth connectivity with the A7670G module for 4G LTE communication. It features a compact design with various interfaces for expansion and power management, including an 18650 battery holder.

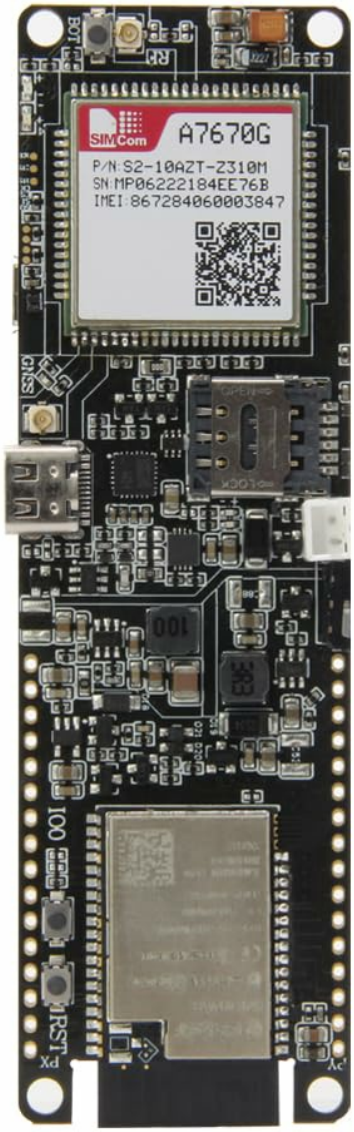

Figure 1: Front and back view of the LILYGO T-A7670G R2 Development Board. The front shows the ESP32 module and SIMCOM A7670G, while the back features the 18650 battery holder.

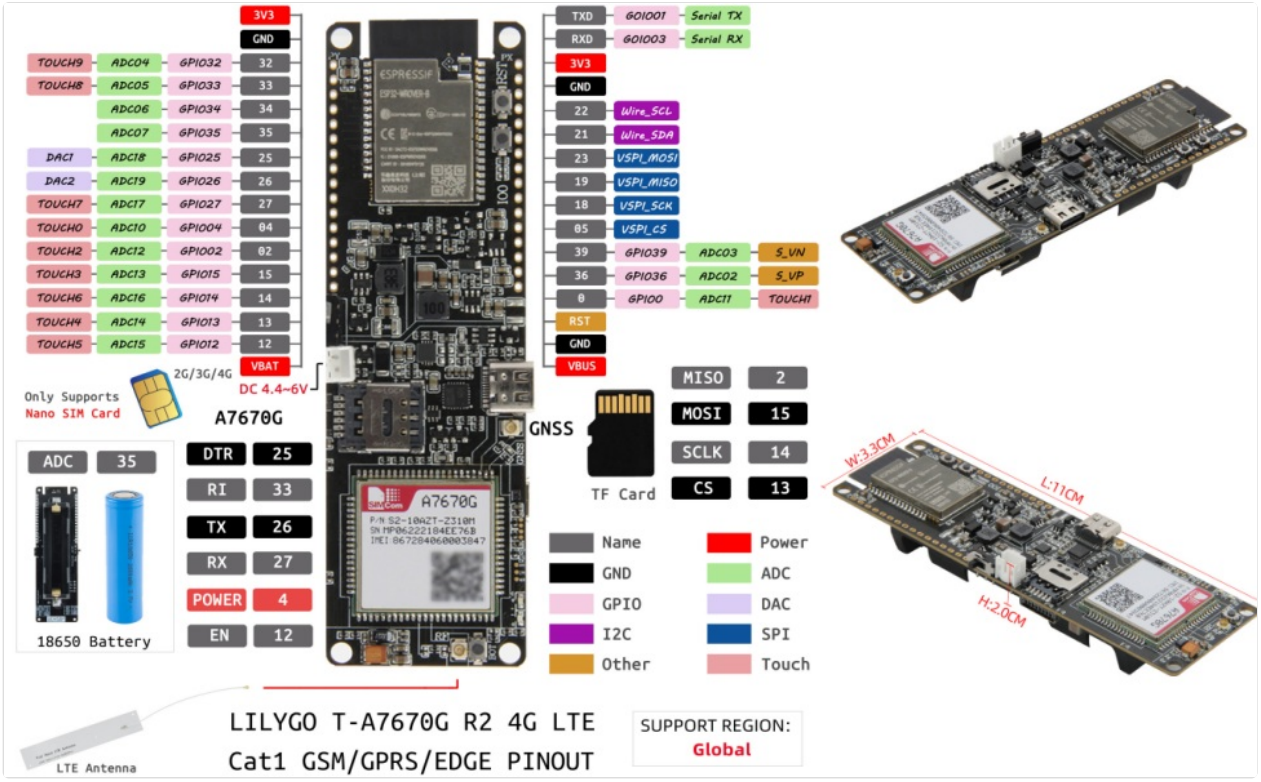

Figure 2: Detailed pinout diagram for the LILYGO T-A7670G R2, illustrating GPIOs, power pins, and module-specific connections.

3. Setup Instructions

3.1. Component Installation

1. **SIM Card:** Insert a Nano SIM card into the designated slot on the board. Ensure it is correctly oriented. The board supports 2G/3G/4G networks.
2. **TF Card:** Insert a TF (MicroSD) card into the card slot if storage is required for your application.
3. **Antennas:** Connect the LTE antenna to the main antenna connector and the GPS antenna to the GPS connector (if using the A7670G with GPS variant). Ensure secure connections.
4. **Battery:** If using battery power, insert an 18650 battery into the battery holder, observing correct polarity. Alternatively, connect a PH2.0 battery cable to an external battery source.

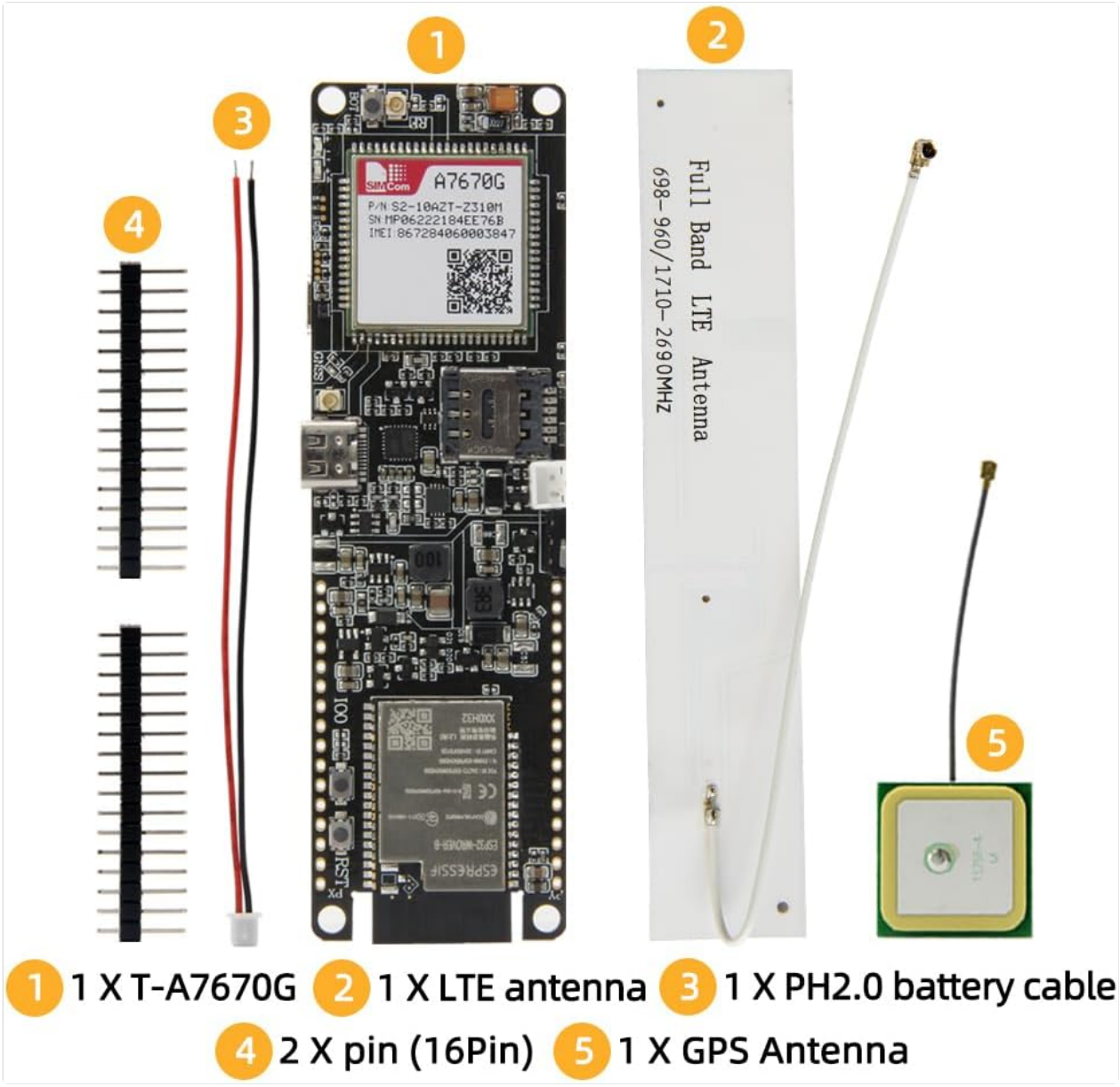

Figure 3: Included components with the LILYGO T-A7670G R2, typically including the board, LTE antenna, PH2.0 battery cable, and pin headers. The GPS antenna is included with GPS variants.

3.2. Driver Installation

For USB communication and development, you may need to install drivers for the USB-to-Serial chip. Drivers are available for Microsoft Windows 7/8/10, Linux, and Android operating systems. Refer to the official LILYGO GitHub repository for the latest driver links and installation guides.

3.3. Initial Power-Up

Connect the board to a power source via the USB-C port or an inserted 18650 battery. The board should power on, indicated by LED activity. For detailed programming and initial configuration, consult the examples and documentation on the LILYGO GitHub page: github.com/Xinyuan-LilyGO/LilyGO-T-A7670X.

4. Operating Instructions

4.1. Cellular Communication (4G LTE CAT1)

The integrated SIMCOM A7670G module provides 4G LTE CAT1 connectivity. This allows for data transfer over cellular networks. The module supports various protocols including TCP/IP, IPV4/IPV6, Multi-PDP, FTP/FTPS, HTTP/HTTPS, and DNS. Programming examples for establishing cellular connections and

sending/receiving data are available on the LILYGO GitHub.

4.2. GPS Functionality

For the A7670G variant with GPS, the module can acquire location data. Ensure the GPS antenna is properly connected and has a clear view of the sky for optimal performance. Software libraries and examples for accessing GPS data are provided in the GitHub repository.

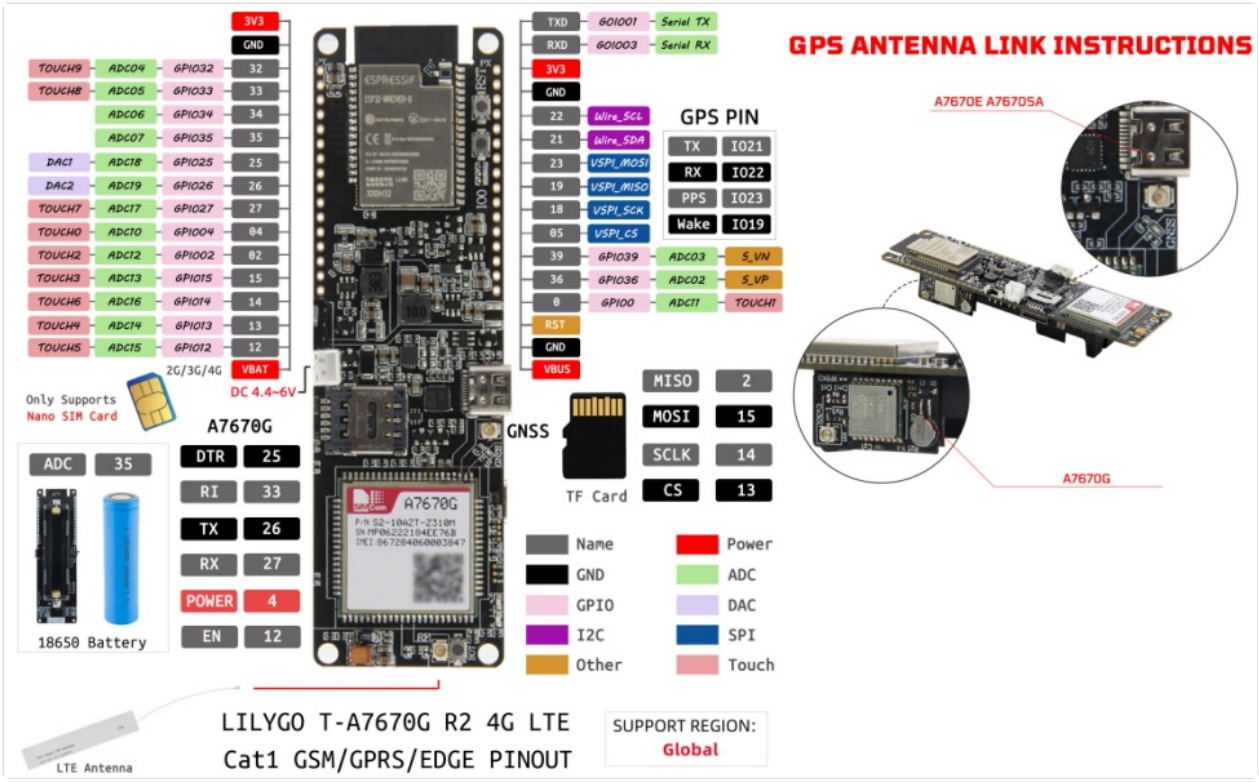

Figure 4: Instructions for connecting the GPS antenna to the LILYGO T-A7670G R2 board.

4.3. ESP32 Features

The ESP32 microcontroller provides Wi-Fi and Bluetooth connectivity, along with numerous GPIOs for interfacing with sensors and peripherals. Develop your applications using the Arduino IDE or ESP-IDF framework. Refer to the pinout diagram (Figure 2) for GPIO assignments.

4.4. Android RIL Support

The module supports Android RIL (Radio Interface Layer) for Android versions 5.0 through 9.0, enabling integration with Android-based systems for cellular functions.

5. Maintenance

To ensure the longevity and optimal performance of your LILYGO T-A7670G R2 board, follow these general maintenance guidelines:

- **Environmental Conditions:** Operate the board within its specified temperature and humidity ranges. Avoid exposure to extreme conditions, moisture, or dust.
- **Physical Handling:** Handle the board with care to prevent damage to components or connectors. Avoid static discharge by using appropriate ESD precautions.
- **Firmware Updates:** Regularly check the LILYGO GitHub repository for firmware updates for both the ESP32 and the A7670G module (FOTA - Firmware Over-The-Air). Keeping firmware updated can improve performance and address known issues.

- **Cleaning:** If necessary, gently clean the board with a soft, dry brush or compressed air. Do not use liquids or solvents.

6. Troubleshooting

This section addresses common issues you might encounter:

- **Board Not Powering On:**
  - Ensure the USB-C cable is securely connected to a power source.
  - If using an 18650 battery, verify it is charged and inserted with correct polarity.
- **USB Driver Issues:**
  - If the board is not recognized by your computer, ensure the correct USB drivers are installed for your operating system. Refer to the LILYGO GitHub for driver links.
- **No Cellular Connection:**
  - Verify the Nano SIM card is correctly inserted and active with a data plan.
  - Ensure the LTE antenna is securely connected.
  - Check network coverage in your area.
  - Some users have reported issues like an arbitrary "715 error" or modem entering roaming mode unexpectedly. This may require specific AT commands to enable roaming or address noise issues. Consult the LILYGO GitHub community forums for solutions and firmware updates.
- **GPS Not Acquiring Signal:**
  - Ensure the GPS antenna is connected and has an unobstructed view of the sky.
  - Verify that GPS functionality is enabled in your software.
- **Code Upload Failure:**
  - Check that the correct board and port are selected in your IDE.
  - Ensure all necessary libraries are installed.

For more advanced troubleshooting or specific error codes, refer to the LILYGO GitHub community and documentation.

7. Specifications

Feature	Detail
Model Name	T-A7670G R2
Processor	ESP32 (Espressif, 2 cores)
Cellular Module	SIMCOM A7670G (4G LTE CAT1, GSM/GPRS/Edge)
GPS	Integrated (A7670G variant)
RAM	LPDDR4 (ESP32)
Wireless Type	802.11ac (Wi-Fi), Bluetooth (ESP32)
Operating System Support	Android RIL (5.0/6.0/7.0/8.0/9.0), USB Driver (Windows 7/8/10, Linux, Android)

Feature	Detail
Protocols Supported	TCP/IP, IPV4/IPV6, Multi-PDP, FTP/FTPS, HTTP/HTTPS, DNS
Additional Support	TLS, File System, LBS, FOTA, WWAN (RNDIS), ECM
SIM Card Type	Nano SIM
Storage	TF Card slot
Power Input	USB-C, 18650 Battery (VBAT DC 4.4-6V)
Dimensions (Approx.)	Length: 11cm, Width: 3.3cm, Height: 2.0cm

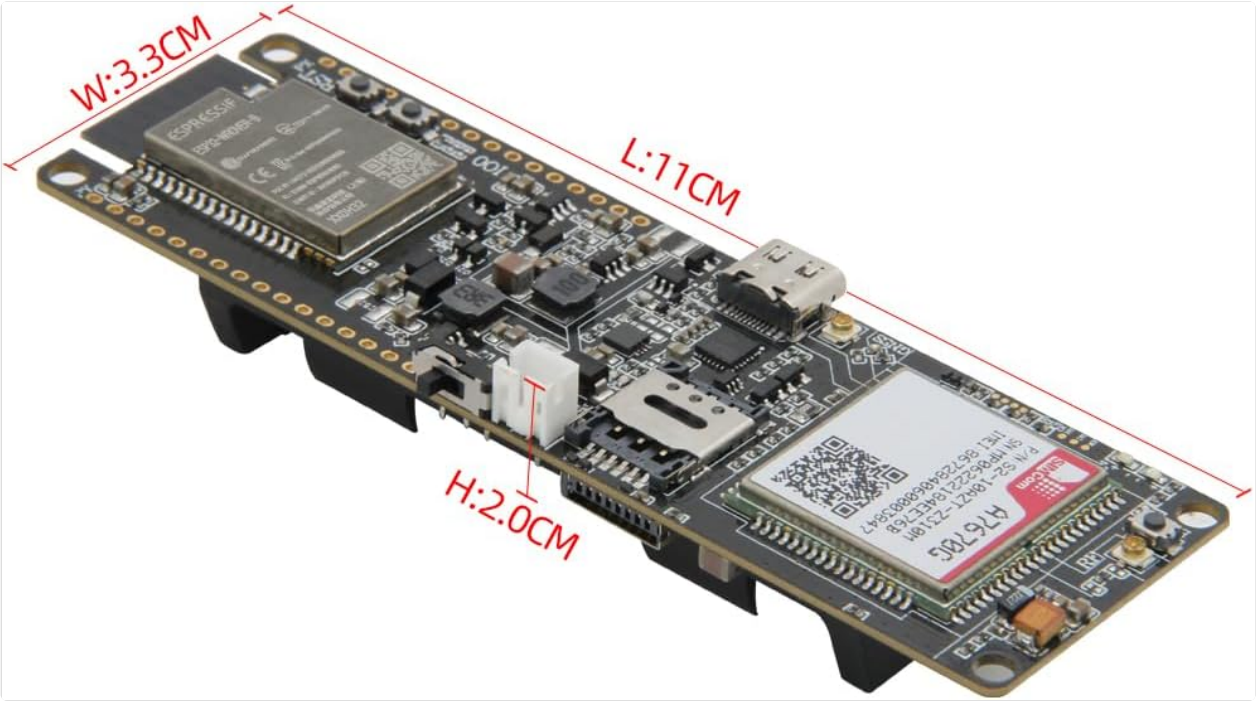

Figure 5: Approximate dimensions of the LILYGO T-A7670G R2 development board.

8. Warranty and Support

8.1. Warranty Information

Warranty terms for the LILYGO T-A7670G R2 development board are provided by the seller or manufacturer at the time of purchase. Please retain your proof of purchase for any warranty claims. For specific details regarding warranty coverage and duration, contact your point of purchase or LILYGO directly.

8.2. Technical Support

For technical assistance, detailed documentation, code examples, and community support, please visit the official LILYGO GitHub repository:

- LILYGO T-A7670X GitHub Repository

The GitHub page is regularly updated with the latest information, firmware, and community discussions that can help resolve issues and provide guidance for your projects.