

Unknown CC1101TR4S

CC1101TR4S Wireless Transceiver Module User Manual

Models: CC1101TR4S, Yu-szwx447

1. INTRODUCTION

This manual provides essential information for the proper setup, operation, and maintenance of the CC1101TR4S Wireless Transceiver Module. This module is designed for reliable wireless communication in various applications, supporting multiple frequency bands and modulation methods.

2. PRODUCT OVERVIEW

The CC1101TR4S is a versatile wireless transceiver module capable of operating at 433MHz and 868MHz, with customization options for 315MHz and 915MHz. It features efficient GFSK modulation, robust anti-interference capabilities, and built-in hardware CRC error detection, making it suitable for industrial control environments. The module supports FSK, GFSK, and MSK modulation methods and offers high receive sensitivity up to -110dBm at 1.2kbps.

Key features include:

- **Operating Frequencies:** 433MHz / 868MHz (customizable to 315MHz / 915MHz).
- **Operating Voltage:** 3.3V.
- **Maximum Operating Rate:** 500kbps.
- **Modulation Methods:** FSK, GFSK, MSK.
- **Receive Sensitivity:** Up to -110dBm at 1.2kbps.
- **Current Consumption:** TX Mode (<30mA at +10dBm), RX Mode (20mA), Sleep Mode (1uA).
- **Error Detection:** Built-in hardware CRC.
- **Antenna Support:** Spring antenna, rod antenna, whip antenna, RF interface cable (selection depends on application environment).



Figure 1: CC1101TR4S Wireless Transceiver Module. This image shows the compact module with its pin headers, ready for integration into a circuit board.

3. SPECIFICATIONS

Feature	Value
Model Number	CC1101TR4S (Yu-szwx447)
Operating Voltage	3.3V
Operating Frequencies	433MHz / 868MHz (Customizable 315M / 915M)
Max Operating Rate	500kbps
Modulation Methods	FSK, GFSK, MSK
Receive Sensitivity	-110dBm (at 1.2kbps)
TX Mode Current (+10dBm)	< 30mA
RX Mode Current	20mA
Sleep Mode Current	1uA
Module Dimensions (without antenna)	23.4 x 16.3 mm
Pin Pitch	1.27 mm
Item Weight	1.1 pounds (approx. for lot)
Manufacturer	Taida

4. SETUP

Follow these steps to integrate and set up your CC1101TR4S module:

1. **Prepare Host System:** Ensure your microcontroller or host system is ready to interface with the module via SPI (Serial Peripheral Interface).
2. **Power Connection:** Connect the module's VCC pin to a stable 3.3V power supply and GND to ground. Ensure the power supply can provide the necessary current (up to 30mA during TX).
3. **SPI Interface:** Connect the module's MOSI, MISO, SCK, and CSN pins to the corresponding SPI pins on your host system.
4. **GDO Pins:** Connect the GDO0 and GDO2 pins to interrupt-capable pins on your host system if you plan to use interrupt-driven communication (e.g., for packet reception or clear channel assessment).
5. **Antenna Connection:** Attach the appropriate antenna for your application and frequency band (e.g., 433MHz or 868MHz spring antenna). Ensure the antenna is securely connected to the module's RF output.
6. **Software Configuration:** Initialize the CC1101 registers via SPI to set desired frequency, data rate, modulation type (GFSK, FSK, MSK), output power, and other parameters. Refer to the CC1101 datasheet for detailed register descriptions.

5. OPERATING INSTRUCTIONS

Once the module is set up and configured, you can begin transmitting and receiving data:

- **Transmit Mode:**
 - Write data to the TX FIFO buffer via SPI.
 - Issue the STX (Start Transmit) command.
 - The module will automatically transmit the data. Monitor GDO0/GDO2 for packet sent indication if configured.
- **Receive Mode:**
 - Issue the SRX (Start Receive) command.
 - The module will enter receive mode and listen for incoming packets.
 - When a packet is received, GDO0/GDO2 can signal an interrupt.
 - Read data from the RX FIFO buffer via SPI.
- **Frequency Hopping/Channel Switching:** To change operating frequency or channel, update the frequency registers via SPI. Ensure both transmitting and receiving modules are synchronized to the same frequency.
- **Power Management:** Utilize the SLEEP and IDLE states to conserve power when the module is not actively transmitting or receiving.

6. MAINTENANCE

The CC1101TR4S module is designed for robust operation with minimal maintenance. Adhere to the following guidelines:

- **Environmental Conditions:** Operate the module within its specified temperature and humidity ranges. Avoid exposure to extreme temperatures, moisture, or corrosive environments.
- **Physical Handling:** Handle the module with care to prevent physical damage to components or solder joints. Avoid bending or stressing the antenna connection.
- **Cleaning:** If necessary, gently clean the module with a dry, soft cloth. Do not use liquid cleaners or solvents.

- **Antenna Integrity:** Periodically check the antenna for damage or loose connections. A damaged antenna can significantly reduce performance.

7. TROUBLESHOOTING

If you encounter issues with your CC1101TR4S module, consider the following common problems and solutions:

Problem	Possible Cause / Solution
No communication between modules.	<p>Power: Verify 3.3V power supply and ground connections.</p> <p>SPI: Check SPI connections (MOSI, MISO, SCK, CSN) and ensure correct SPI initialization in software.</p> <p>Frequency/Settings: Ensure both modules are configured to the exact same frequency, data rate, modulation, and packet format.</p> <p>Antenna: Confirm antennas are properly connected and undamaged.</p>
Poor range or intermittent connection.	<p>Antenna: Ensure correct antenna type for the frequency and environment. Check for obstructions.</p> <p>Interference: Identify and mitigate sources of RF interference.</p> <p>Output Power: Verify the module's output power setting is appropriate and not too low.</p> <p>Environment: Metal enclosures or dense materials can significantly reduce range.</p>
Module not responding to SPI commands.	<p>Power: Recheck power supply.</p> <p>Reset: Try a software reset of the module (SRES command) or power cycle.</p> <p>SPI Clock: Ensure SPI clock speed is within the module's specifications.</p>

8. WARRANTY AND SUPPORT

Specific warranty information for this product is not provided in the available documentation. For warranty claims, technical support, or further assistance, please contact the seller or manufacturer directly. Ensure you have your purchase details and model number (CC1101TR4S / Yu-szwx447) ready when seeking support.