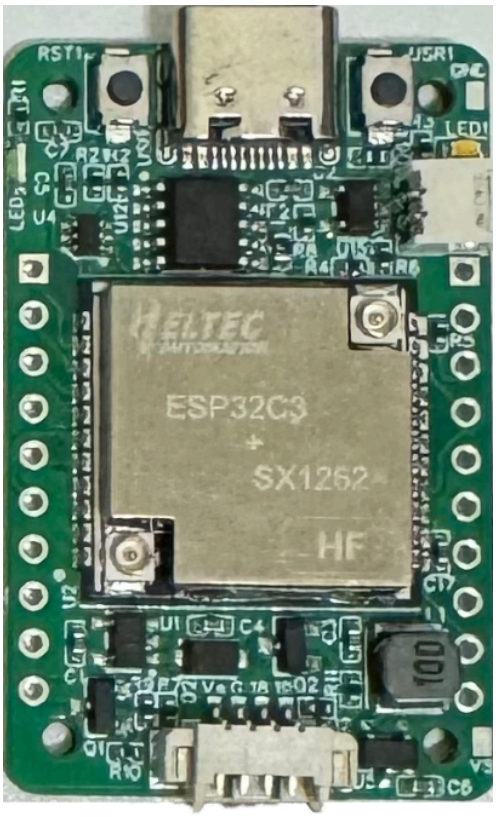
SQ001S

LoRa® Development Board — ESP32-C3 + SX1262, Solar / Li-ion Powered



Siliqs · https://siliqs.net

Document	Rev	Date	Notice
SQ001S Datasheet	Rev 0.1 (Preliminary)	Nov 2026	Guineatech © Limited standard files

Document Version

Version	Time	Description	Remark
Rev. 0.1	2026-11-09	Preliminary version	Living

Copyright Notice

All contents in these files are protected by copyright law, and all copyrights are reserved by Guineatech. Siliqs is a product line of Guineatech. Without written permission, all commercial use of the files is forbidden, such as copy, distribute, reproduce the files, etc., but non-commercial purpose, downloaded or printed by individual are welcome.

Disclaimer

Guineatech reserves the right to change, modify or improve the document and product described herein. Its contents are subject to change without notice. These instructions are intended for your use only. This is a preliminary datasheet; values marked "TBC" (to be confirmed) have no verified source yet and may change.

Trademarks

LoRa® is a registered trademark of Semtech Corporation. LoRaWAN® is a registered trademark of the LoRa Alliance. Bluetooth® is a registered trademark of Bluetooth SIG, Inc. Arduino® is a registered trademark of Arduino SA. ESP32 is a trademark of Espressif Systems. All other trademarks are the property of their respective owners.

CONTENTS

- 1. Description — 1.1 Overview / 1.2 Siliqs product line / 1.3 Product Features
- 2. Specifications — 2.1 General / 2.2 Power / 2.3 LoRa radio / 2.4 Power consumption
- 3. Hardware — 3.1 Board overview / 3.2 Pinout / 3.3 Circuit blocks / 3.4 Dimensions
- 4. Software
- 5. Resource — 5.1 Relevant resource / 5.2 Contact Information

1. Description

1.1 Overview

The SQ001S is a compact LoRa development board for IoT and environmental-monitoring projects. It is built around the HT-CT62 module, which combines an ESP32-C3 (32-bit RISC-V, up to 160 MHz, Wi-Fi and Bluetooth LE) with a Semtech SX1262 LoRa transceiver.

The board is designed to run off-grid: it has a Li-ion battery charger, a solar / low-voltage input that a boost converter raises to 5 V from as little as 1.0 V, and a switchable 3.3 V rail (Vext) that powers external sensors only when needed. It programs over USB Type-C and works with the Arduino ecosystem.

1.2 Siliqs product line

The SQ001S joins a LoRaWAN network through a Siliqs LD1001 gateway, or any standard LoRaWAN gateway.

- An SQ001S with an I2C temperature and humidity sensor on its sensor connector has been run as a LoRaWAN ABP node (AS923, Taiwan), with uplinks reaching a Siliqs gateway's built-in ChirpStack server (Siliqs lab).
- The open-source `siliqs_ct62` library provides the LoRaWAN stack for the HT-CT62 module (section 4).

Typical uses:

- Battery or solar sensor nodes (temperature, humidity, pressure and other I2C sensors).
- Prototyping LoRa / LoRaWAN devices before moving to a dedicated Siliqs product.
- Remote sensing, environmental monitoring and smart agriculture.

1.3 Product Features

- HT-CT62 module: ESP32-C3FN4 (RISC-V, up to 160 MHz, 4 MB flash) + Semtech SX1262 LoRa.
- LoRa 863 – 928 MHz (HF variant), up to 21 ± 1 dBm; Wi-Fi 802.11 b/g/n and Bluetooth LE.
- Li-ion battery charging with charge-indicator LED.
- Solar / low-voltage input (VS pad, 1 – 5 V) boosted to 5 V.
- Switchable 3.3 V external-sensor rail (Vext), controlled by GPIO1.
- USB Type-C with on-board USB-to-UART bridge for programming and console.
- Two 2.54 mm 10-pin headers (breadboard-friendly) and a 1.25 mm 4-pin connector for I2C sensors.
- RESET and USER keys, user LED, battery-voltage sense.
- IPEX connectors for the LoRa and the 2.4 GHz antennas.

2. Specifications

2.1 General specifications

Table 2.1: General specifications

Parameters	Description
Module	Heltec HT-CT62 (HF variant)
MCU	ESP32-C3FN4, 32-bit RISC-V, up to 160 MHz
Memory	384 KB ROM, 400 KB SRAM, 8 KB RTC SRAM, 4 MB SiP flash
LoRa chipset	Semtech SX1262
2.4 GHz wireless	Wi-Fi 802.11 b/g/n; Bluetooth LE
USB	USB Type-C, USB-to-UART bridge (CH340K)

Headers	2 × 10-pin, 2.54 mm pitch
Sensor connector	1 × 4-pin, 1.25 mm pitch (Vext, GND, I2C)
Keys and LEDs	RESET key, USER key (GPIO9), user LED (GPIO0), charge-indicator LED
Antenna connectors	LoRa: IPEX 1.0; 2.4 GHz: IPEX 1.0
Operating temperature	Module: −40 ~ 85 ° C; board: −20 ~ +70 ° C (limited by the USB-to-serial IC; without battery, not verified at system level)
License	Board design files: MIT License

2.2 Power

Table 2.2: Power

Parameter	Value	Notes
USB Type-C input	5 V	Powers the board and charges the battery
Li-ion battery	3 − 4.2 V (single cell)	On-board charger (TP4054); charge current TBC
VS pad (solar / AA / AAA)	1 − 5 V	Boost converter (XT1861B502) to 5 V
System rail	3.3 V	LDO (XC6210B332)
Vext (external sensors)	3.3 V, switched by GPIO1 (drive LOW = on)	P-MOSFET switch; maximum current TBC
Battery sense	GPIO2 (ADC)	Divider ratio TBC

2.3 LoRa radio

Values from the HT-CT62 module datasheet.

Table 2.3: LoRa radio

Parameter	Value
Frequency	863 − 928 MHz (HF variant): EU868, IN865, US915, AU915, KR920, AS923
Max. TX power	21 ± 1 dBm
RX sensitivity	−134 dBm (SF12, 125 kHz); −130 dBm (SF10); −122 dBm (SF7)
LoRaWAN	LoRaWAN 1.0.x, ABP and OTAA (with the `siliqs_ct62` library)
Regulatory	Set TX power within the regional LoRaWAN limits and radio regulations of the country of deployment; type approval of the end product TBC

2.4 Power consumption

Module-level figures from the HT-CT62 datasheet (3.3 V). Board-level current, including the charger, boost and LDO, is TBC.

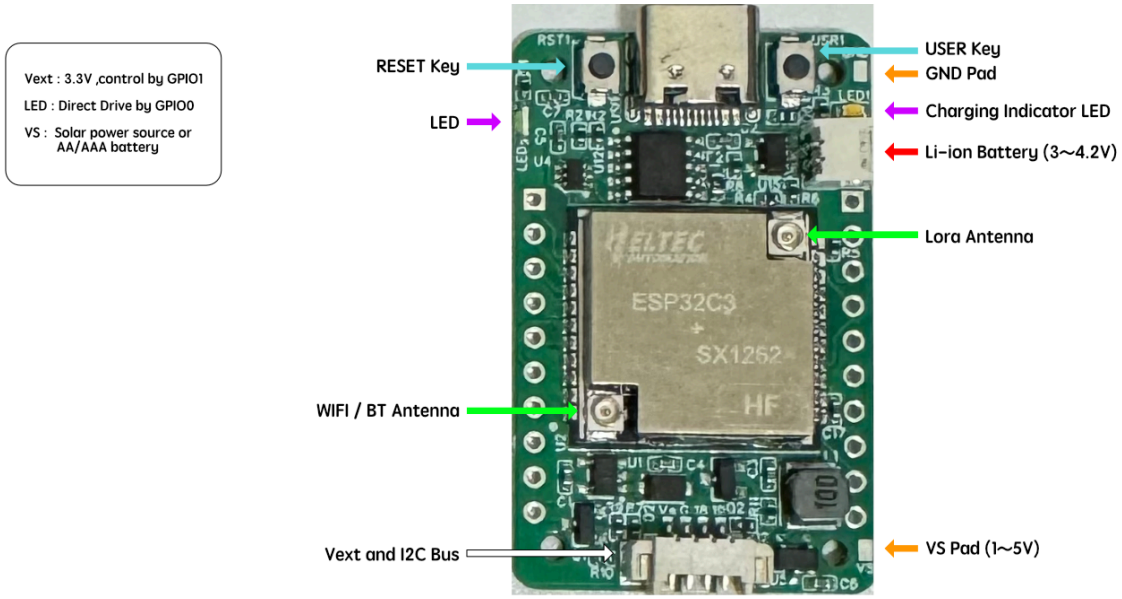
Table 2.4: Module power consumption

Mode	Typical
Wi-Fi scan	80 mA
Wi-Fi AP	120 mA
LoRa TX, 14 / 17 / 22 dBm (470 MHz)	120 / 140 / 170 mA
LoRa RX	40 mA
Deep sleep	10 µA

3. Hardware

3.1 Board overview

Figure 3.1: Board overview



SQ001S board overview

- USB Type-C (top edge): power, battery charging, programming and serial console.
- RESET / USER keys: RESET restarts the module; USER is on GPIO9 (also the boot key for USB download mode).
- Li-ion battery connector with charge-indicator LED.
- VS pad (1 – 5 V): solar panel or AA / AAA cells, boosted to 5 V.
- Sensor connector (bottom edge, 1.25 mm 4-pin): Vext and I2C bus.
- IPEX connectors on the module for the LoRa and the Wi-Fi / Bluetooth antennas.

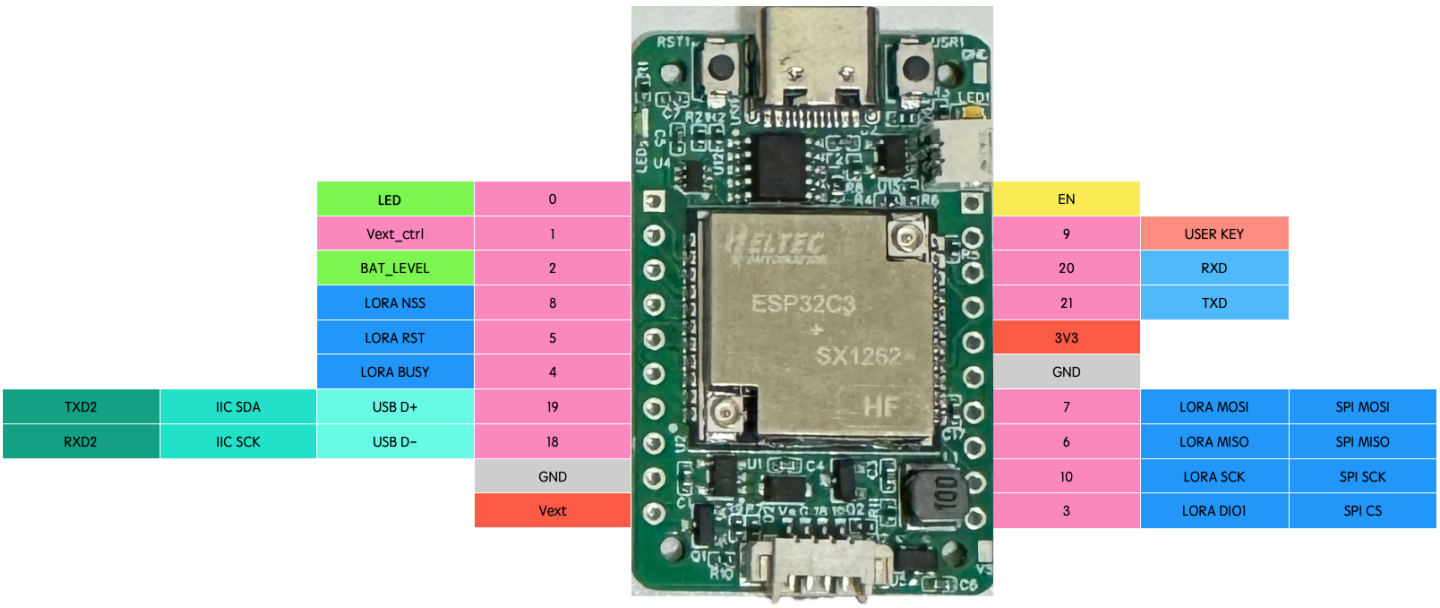
3.2 Pinout

Table 3.2: Header pinout

Left header	GPIO	Function	Right header	GPIO	Function
1	0	User LED	1	EN	Reset (EN)
2	1	Vext control	2	9	USER key
3	2	Battery level (ADC)	3	20	UART RXD
4	8	LoRa NSS	4	21	UART TXD
5	5	LoRa RST	5	—	3V3
6	4	LoRa BUSY	6	—	GND
7	19	I2C SCL / USB D+ / TXD2	7	7	LoRa MOSI / SPI MOSI
8	18	I2C SDA / USB D− / RXD2	8	6	LoRa MISO / SPI MISO
9	—	GND	9	10	LoRa SCK / SPI SCK
10	—	Vext	10	3	LoRa DIO1 / SPI CS

> I2C: the current firmware uses GPIO18 = SDA and GPIO19 = SCL. An earlier pinout drawing labels these two the other way round — follow the firmware. The LoRa SPI pins are shared with the on-board SX1262; use them for other SPI devices only with a separate chip select.

Figure 3.2: Pinout



SQ001S pinout

3.3 Circuit blocks

From the board schematic (2024-03-15).

Table 3.3: Circuit blocks

Block	Main part	Function
Core	HT-CT62	ESP32-C3 + SX1262 module
USB	CH340K	USB Type-C to UART for programming and console
Charger	TP4054	Single-cell Li-ion charging from USB
Boost	XT1861B502	VS input (1 – 5 V) to 5 V
LDO	XC6210B332	3.3 V system rail
Vext switch	AO3401A	Switches 3.3 V to external sensors (GPIO1)

3.4 Dimensions

Board outline, mounting holes and weight: TBC. Overall size is close to that of a 2 × 10-pin, 2.54 mm-pitch breadboard module.

4. Software

Item	Description
Development environment	Arduino IDE or PlatformIO (ESP32-C3)
LoRaWAN library	`siliqs_ct62` (open source): RadioLib-based LoRaWAN for HT-CT62; ABP and OTAA, AS923 Taiwan channel plan
Download mode	Hold USER (BOOT), press RESET, release USER; then flash over USB
Serial console	115200 baud over USB Type-C

5. Resource

5.1 Relevant resource

- Siliqs product website: https://siliqs.net
- SQ001S documentation: https://living-huang.gitbook.io/siliqs/mainboards/sq001s
- `siliqs_ct62` LoRaWAN library: https://github.com/siliqs/siliqs_ct62
- LD1001 Datasheet (LoRaWAN gateway)

5.2 Contact Information

Siliqs (Guineatech)

- Web: https://siliqs.net
- Email: support@siliqs.net
- Phone: +886-2-7751-5339
- Pricing and lead time: please contact us.