# Touchdot S3 Development Board Product Brief

Compact ESP32-S3 mini microcontroller development board inspired by Lilypad. Ideal for IoT, control systems, and creative electronics projects.

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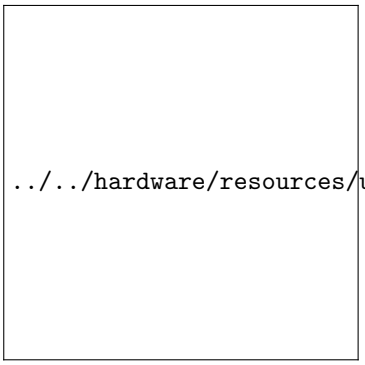
## Introduction

The Unit Touchdot S3 is a compact ESP32-S3 Mini board designed for wearable electronics, IoT devices, educational projects, and smart automation. Its Lilypad-inspired, low-profile, sewable design makes it perfect for integrating into textiles and compact enclosures while providing advanced wireless and processing capabilities.

Equipped with 2.4 GHz Wi-Fi, Bluetooth 5.0, and a modern interface featuring a USB-C connector, onboard LiPo charging, and a QWIIC I²C port, the board supports rapid prototyping and creative development. It offers a robust platform bridging wearable design and embedded computing, tailored for students, makers, and engineers.




## Functional Description

- Integrated ESP32-S3 module with 2.4 GHz Wi-Fi and Bluetooth 5.0
- USB-C connector for power and programming
- 3.3V power rail compatible with low-voltage peripherals
- Built-in QWIIC connector for easy I²C module integration
- Micro SD card slot using SPI interface
- Onboard NeoPixel (WS2812) RGB LED

## Electrical Characteristics

- Operating voltage: 3.3V
- Max current draw: 500mA (with Wi-Fi active)
- GPIO logic level: 3.3V
- ADC resolution: 12-bit (0–4095)
- Touchpad sensitivity: configurable

## Applications

- Wearable electronics
- IoT sensor nodes
- Smart home and automation
- Educational tools for STEM (science, technology, engineering, and mathematics)
- Environmental monitoring
- Creative electronics and art-tech installations
- Smart Home
- Health Care

## Settings

### Interface Overview

| Interface | Signals / Pins | Typical Use |
|---|---|---|
| UART | TX (GPIO17) | Serial transmit (TX) |
| UART | RX (GPIO16) | Serial receive (RX) |
| I2C | SDA (GPIO5) | I²C data line (QWIIC, OLED, sensors) |
| I2C | SCL (GPIO6) | I²C clock line |
| SPI | MOSI (GPIO9) | Data to SPI device |
| SPI | MISO (GPIO8) | Data from SPI device |
| SPI | SCK (GPIO13) | SPI clock signal |
| SPI | CS (GPIO21) | Chip select for SPI device |
| USB | D+ (GPIO20) | USB differential data (+) |
| USB | D (GPIO19) | USB differential data () |

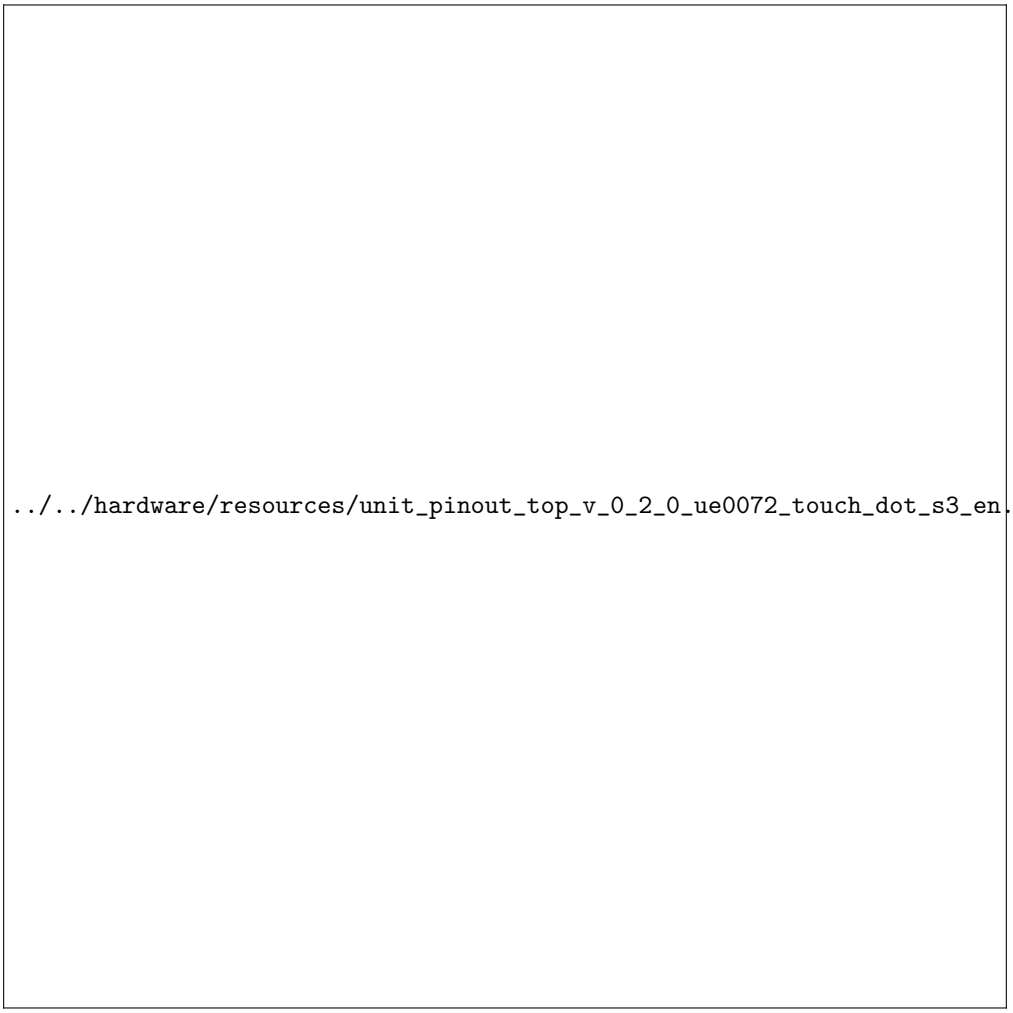
### Supported Pins

| Symbol | I/O | Description |
|---|---|---|
| USB -C | Input | USB-C connector for 5V power and data |
| Li-ion/LiPo | Input | Connector for LiPo battery power (3.7V - 4.2V) |
| VCC | Input | Main power supply (3.3V) |
| GND | Ground | Ground connection |
| IO | Bidirectional | General-purpose I/O pins |
| NeoPixel | Output GPIO25 | WS2812 RGB LED data output |

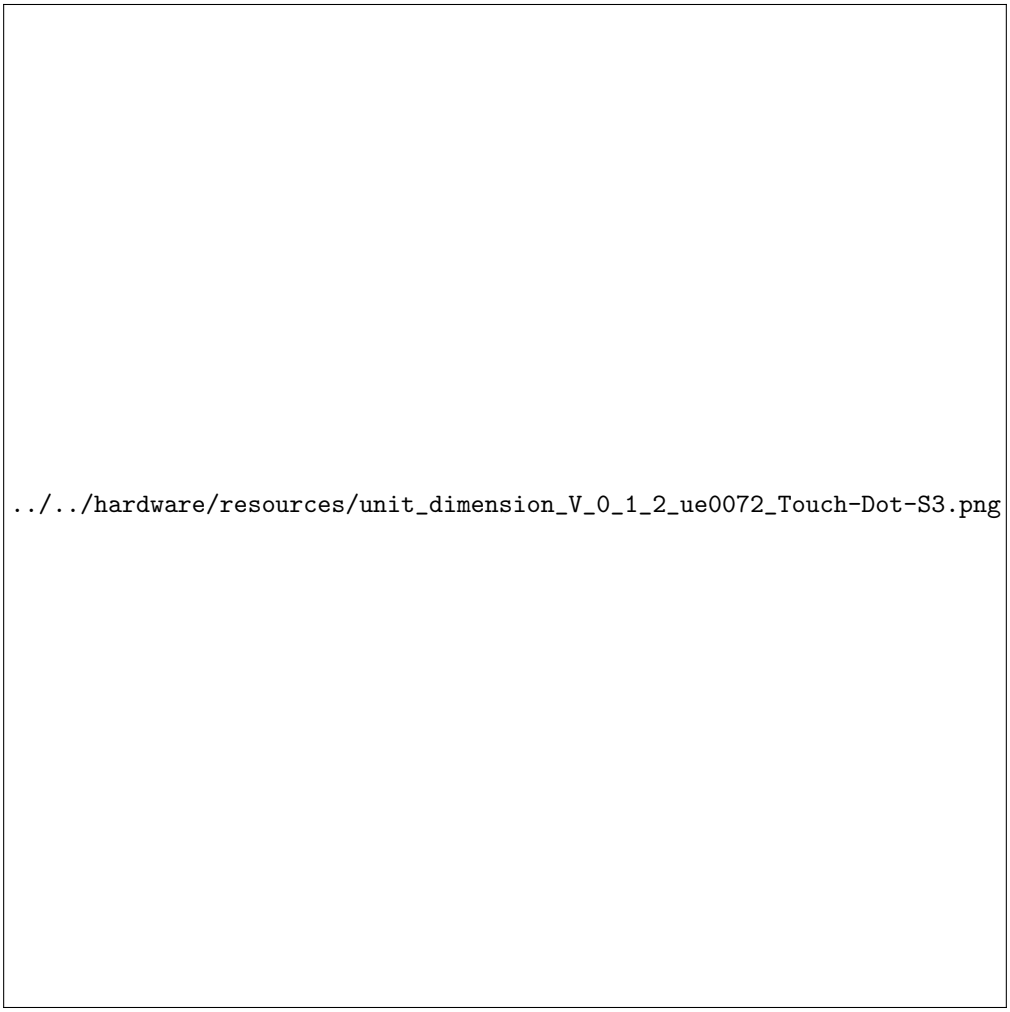
## Pin & Connector Layout

| Group | Availables pins | Suggested use |
|---|---|---|
| GPIO | D2 to D13 | Sensors, actuators |
| UART | Tx and Rx | Serial communication |
| TouchPad | T1 to T11 | Capacitive sensors for touch detection |
| Analog | A0 to A8 | 12-bit (0–4095) resolution |
| SPI | Optional | Displays, additional memory |

## Block Diagram



## Dimensions




## Usage

- Arduino IDE (ESP32 board manager)
- ESP-IDF toolchain
- MicroPython firmware
- CircuitPython (via UF2 bootloader)

## Downloads

- Schematic PDF
- Board Dimensions
- Pinout Diagram PNG

## Purchase

- Buy from UNIT Electronics
- Open product page