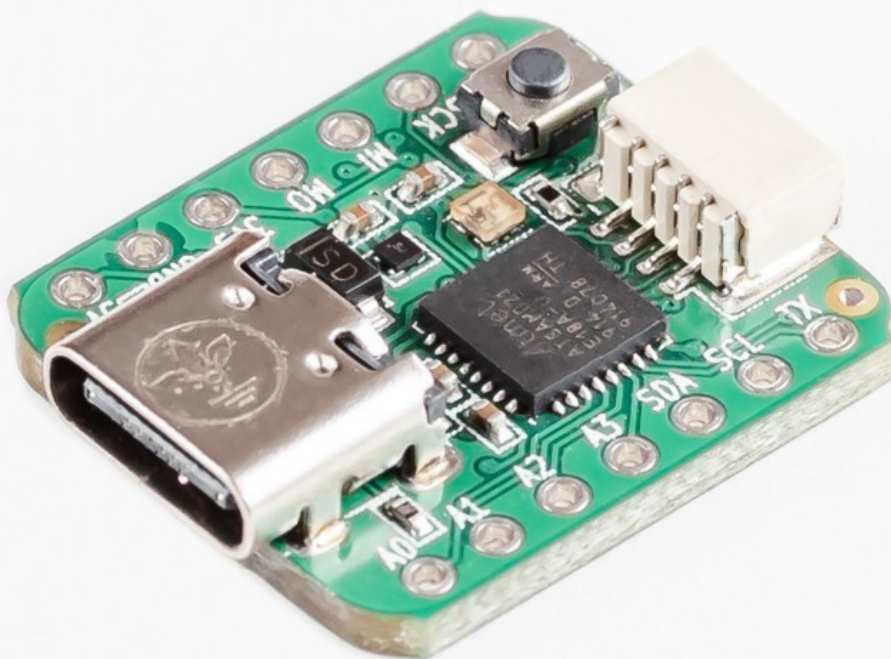


# Groundstudio Jade Pebble development board



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# Board Pinout

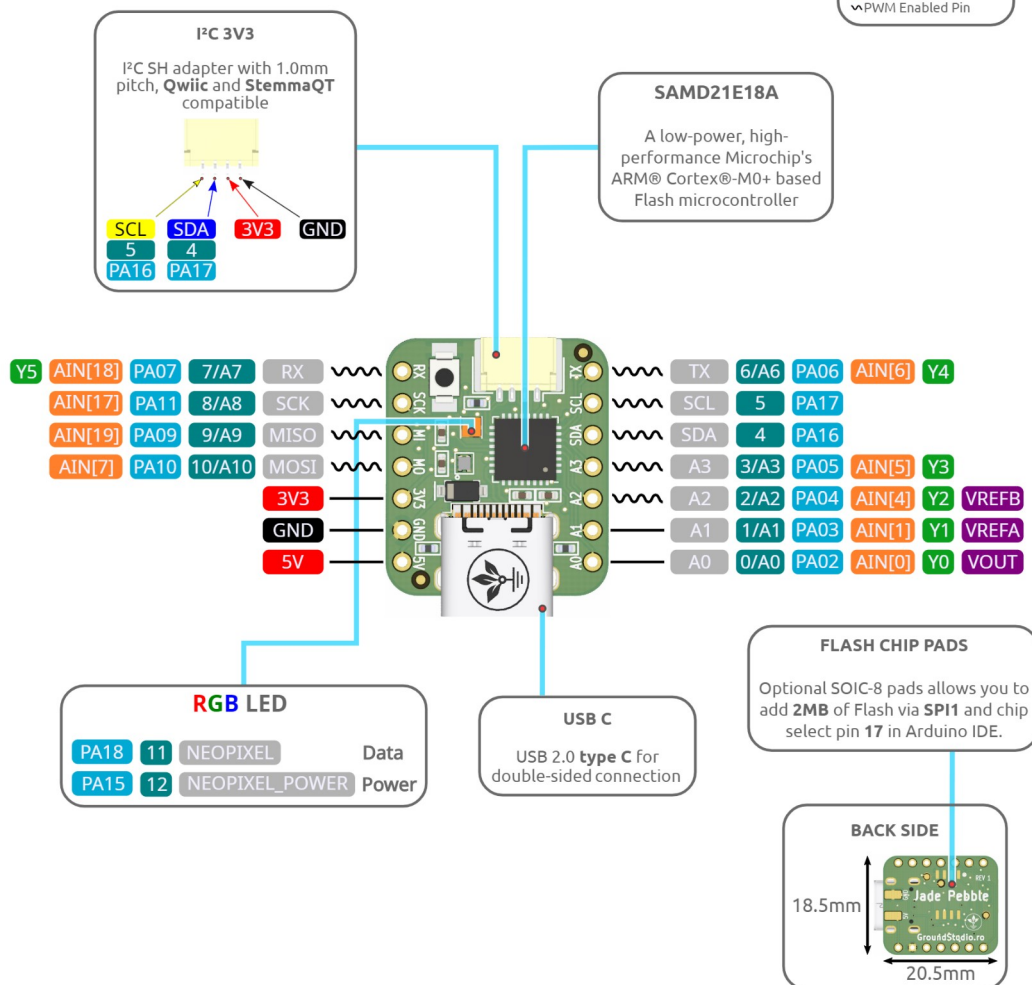
## GroundStudio Jade Pebble

Very small **SAMD21E18A** based development board with **48 MHz 32 bit processor**, **256kBytes of Programmable Flash** program memory, **32kBytes Internal SRAM**, **6 Capacitive Touch sensing (PTC)**, **9 PWM Channels**, **11 Digital Pins**, **9 channel 12 bit ADC Pins** and built in **RGB NeoPixel LED**.



### COLOR DIAGRAM

- CircuitPython Name
- Arduino Name
- uController Pin
- ADC Channel
- SCL
- SDA
- Touch
- DAC / VREF
- Ground
- Power
- ~ PWM Enabled Pin



Board: "GroundStudio Jade Pebble" KASVHX\_GS REV0.1

Credits: "Adafruit QT Py" by Adafruit

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Pinout REV: 1

Figure 1: GroundStudio Jade Pebble pinout [Revision 1]

# Board Circuit Schematic

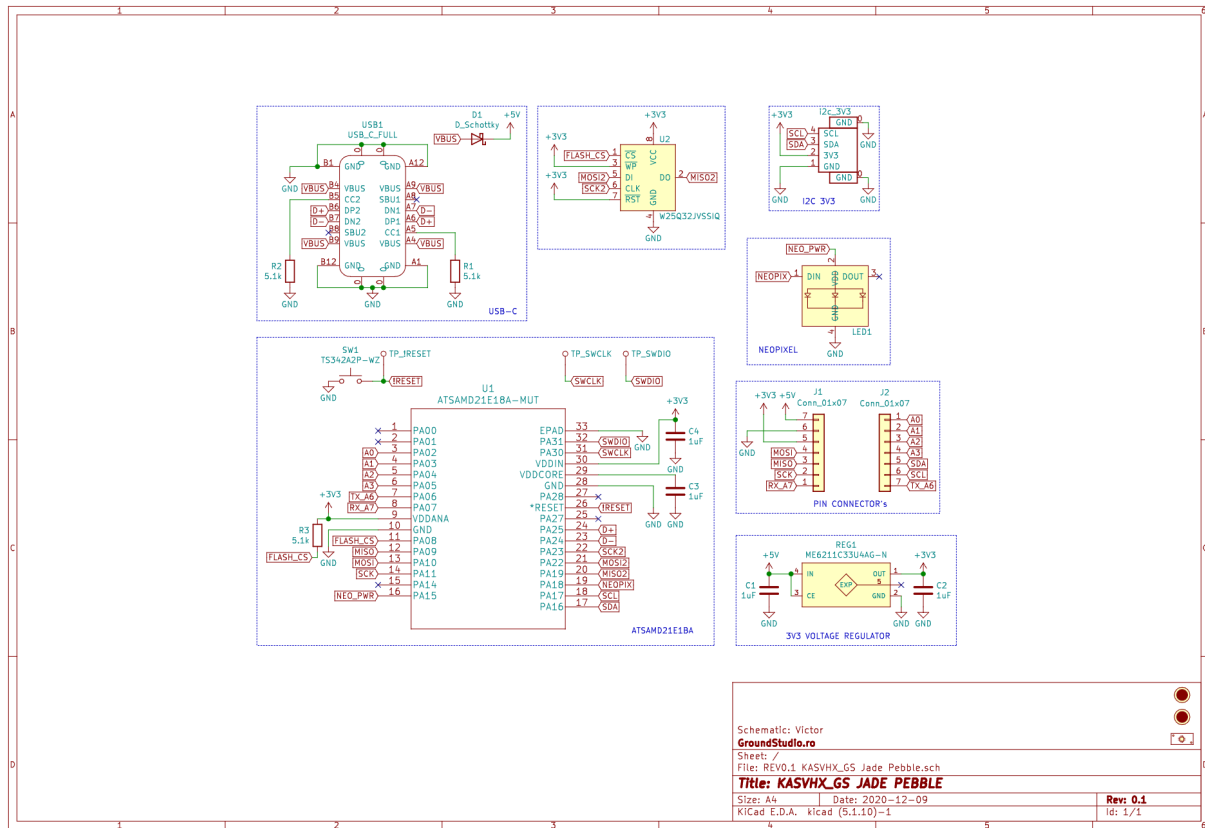


Figure 2: GroundStudio Jade Pebble schematic circuit [Revision 0.0.1]

## Open Source

This is an Open Source project, you can find all the technical documents online:

[https://github.com/GroundStudio/GroundStudio\\_Jade\\_Pebble](https://github.com/GroundStudio/GroundStudio_Jade_Pebble)

## License

All documentation for GroundStudio Marble Pico is released under the [Attribution-ShareAlike 4.0 International \(CC BY-SA 4.0\)](#) license. You are welcome to use this for commercial purposes.

Please consider contributing back to this project or others to help the open-source hardware community continue to thrive and grow!

## Overview

A small development board that uses the ATSAMD21E18 microcontroller, made for projects where small dimensions are required.

Jade Pebble is pin compatible and has a similar shape to the QT PY model made by adafruit or XIAO made by Seeed.

The I<sup>2</sup>C 3V3 connector is compatible with Qwiic (SparkFun) and STEMMA QT (Adafruit) standards.

## Technical specifications

USB **Type C** connector

5V pin supply voltage: 4.3V-6.5V DC

Microcontroller ATSAMD21E18 with 32-bit Cortex M0+ processor operates at a maximum of 48 MHz

Flash memory: **256kB**

RAM memory: **32kB**

Regulator 3.3V / 500mA

I<sup>2</sup>C\_3V3 connector compatible with **Qwiic** (SparkFun) and **STEMMA QT** (Adafruit) systems

GPIO Pins: **11**

Integrated **RGB LED**

Dimensions: **22mm x 18mm**

Optional (experimental): a SOIC-8 Flash chip connected via SPI can be added (for example: W25Q32JVSSIQ)

Careful! - The 5V pin is connected directly to the voltage of the USB port. To use this pin as INPUT POWER (power supply for the development board) you must additionally use a diode between the external voltage source (the ANODE of the diode) and the 5V pin (the CATHODE of the diode) so that the 5V pin reaches a voltage within the range 4.3V-6.5V DC.

- Also, the USB port cannot be powered through this pin.

## **Pins configuration:**

### **GPIO / Analog Inputs:**

A0/D0 - GPIO digital pin 0. It can be used as a DAC output (digital to analog converter) with 10 bit precision but it does not have PWM. Can be used as capacitive touch input.

A1/D1 - GPIO digital pin 1. Can be used as capacitive touch input or AREF pin.

A2/D2 - GPIO digital pin 2. Can be used as PWM output or capacitive touch input.

A3/D3 - GPIO digital pin 3. Can be used as PWM output or capacitive touch input.

### **I2C\_3V3 pins:**

SDA/D4 - GPIO digital pin 4 and the data pin for I2C communication. It can be used as a PWM output but it has no ADC or DAC.

SCL/D5 - GPIO digital pin 5 and the clk pin for I2C communication. It can be used as a PWM output but it has no ADC or DAC.

Careful! - These pins do not have pull-up resistors connected, so it may be necessary to add a resistor of 2.2k-10k at 3.3V on each of the 2 pins.

I2C\_3V3 - This adapter allows connection via I2C (without tinning) to compatible boards.

### **Pins for serial communication:**

TX/A6/D6 - Output for Serial1. Can be used as analog/digital pin 6, PWM or capacitive touch input.

RX/A7/D7 - Input for Serial1. It can be used as analog/digital pin 7, PWM or capacitive touch input.

### **SPI Pins:**

SCK/A8/D8 - SPI clock pin. Can be used as analog/digital pin 8 or PWM output.

MI/A9/D9 - Pin Microcontroller In Serial Out. Can be used as analog/digital pin 9 or PWM output.

MO/A10/D10 - Pin Microcontroller Out Serial In. Can be used as analog/digital pin 10 or PWM output.

### **RGB LED:**

The RGB LED is connected to digital pin 11 for the signal. If you want to turn off the power supply to reduce energy consumption, set pin 12 LOW. Pin 12 is set HIGH by default by Arduino/CircuitPython.

### **Pins for capacitive touch:**

A0, A1, A2, A3, A6(TX), A7(RX) can be used as capacitive pins without needing another driver.

### **Analog output pins:**

Only pin A0 can be used as analog output (not PWM!) at a resolution of 10 bits.

### **Analog input pins:**

All pins, except SDA/SCL can be used as analog inputs with a read resolution of 12 bits.

### **PWM output:**

All pins except A0 and A1 can be used as PWM output.

### **I2S Pins:**

The "data" pin is RX.

The "bit clock" pin is MOSI.

The "word select" pin is SCK.

\*Only one "data" pin is available, so both I2S functions, input and output, cannot be used.

The ATSAM21E microcontroller includes a 256kB flash memory for storing the code and other integrated files. If more memory is needed, a flash memory chip (eg 2MB/4MB/8MB) connected via SPI can be added by soldering. The board includes a footprint on the back on which a chip from the 25Q series in the SOIC-8 package can be soldered.

If connected (optional), the SPI flash memory can be accessed in the Arduino via SPI1 and chip select pin 17. In CircuitPython a 'haxpress' version of the program must be installed to include the entire space.



## Legal disclaimer notice

This development board is considered a subassembly in accordance with FCC CFR Title 47 §15.101(e):

[https://www.ecfr.gov/current/title-47/chapter-I/subchapter-A/part-15/subpart-B/section-15.101#p-15.101\(e\)](https://www.ecfr.gov/current/title-47/chapter-I/subchapter-A/part-15/subpart-B/section-15.101#p-15.101(e))

The device does not have a standalone functionality and does not include an enclosure or power supply.

The device is mainly intended for development and prototyping but it can be integrated into a product. In this case it is the responsibility of the developer/manufacturer to obtain all the necessary certifications.

GroundStudio is a registered trademark of ARDUSHOP SRL:

<https://www.tmdn.org/tmview/#/tmview/detail/EM500000018364087>

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## Datasheet Revision History

[Revision 1] - Initial version release