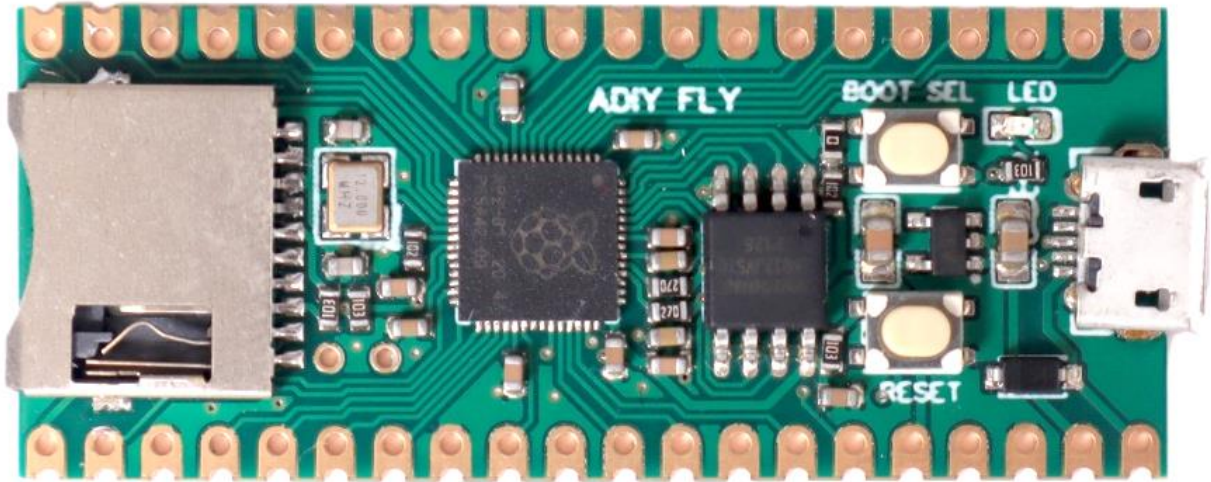


ADIY FLY

RP2040 Board

Overview



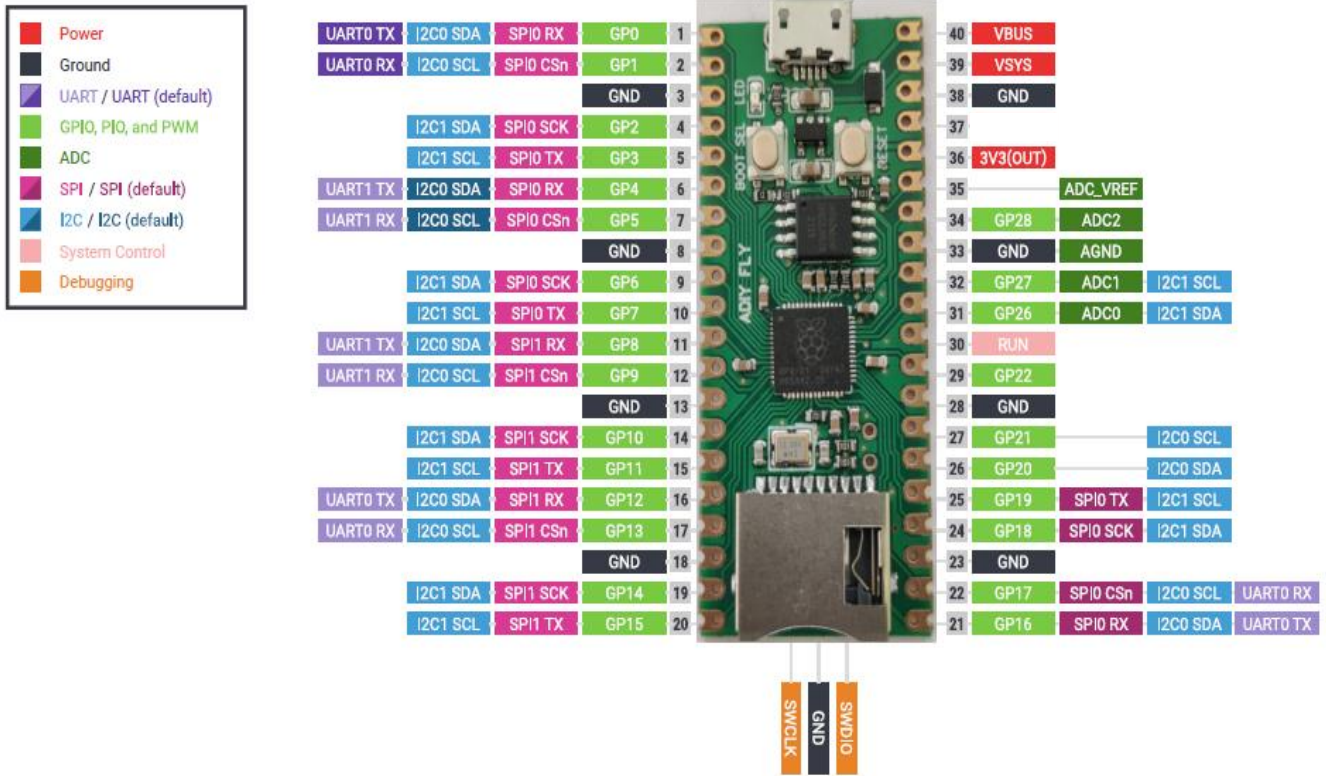
ADIY FLY comes with a large on-chip memory, symmetric dual-core processor complex, deterministic bus fabric, and rich peripheral set augmented with a unique Programmable I/O (PIO) subsystem, RP2040 provides professional users with unrivalled power and flexibility. ADIY FLY pairs RP2040 with 4MB of Flash memory, and a power supply chip supporting input voltages from 1.8-5.5V. It provides 26 GPIO pins, three of which can function as analogue inputs, on 0.1"-pitch through-hole pads with castellated edges. ADIY FLY has SD card slot installed. The RESET button on ADIY FLY makes the usage of module easy.

RP2040 is manufactured on a modern 40nm process node, delivering high performance, low dynamic power consumption, and low leakage, with a variety of low-power modes to support extended-duration operation on battery power.

Technical Specifications

1. Form factor : 21 mm × 51 mm
2. CPU : Dual-core Arm Cortex-M0+ @ 133MHz
3. Memory : 264KB on-chip SRAM; 4MB on-board Flash memory
4. Interfacing : 26 GPIO pins, including 3 analog inputs
5. Peripherals :
 - 2 × UART.
 - 2 × SPI controllers.
 - 2 × I2C controllers.
 - 16 × PWM channels.
 - 1 × USB 1.1 controller and PHY, with host and Device support.
 - 8 × PIO state machines.
6. Input power : 1.8–5.5V DC.
7. SD Card Slot : Included.
8. Reset button : Included
9. Operating temperature : -20°C to +85°C.
10. Castellated module allows soldering direct to carrier boards
11. Drag-and-drop programming using mass storage over USB

Pin Layout



ADIY FLY RP2040 development shield has a total of 40 pins or GPIOs out of which 26 GPIOs are multi-purpose. ADIY FLY is based on a 3.3V compatible controller board RP2040 so the operating voltage on these GPIOs should not exceed 3.3 volts. Out of these 26 pins, 23 pins (GPIO0 to GPIO22) are digital only and 3 pins (GPIO26 to GPIO28) can either be used as digital GPIOs or as ADC inputs. ADIY FLY has 2 SPI pins, 2 I2C pins, 2 UART pins, 16 Controllable PWM pins, and 9 ground pins. On the backside of development board, all the pins are clearly labelled. This board has 3 extra serial wire debug port pins.

VBUS is the micro-USB input voltage, connected to micro-USB port pin 1. This is normally 5V (or 0V if the USB is not connected or not powered).

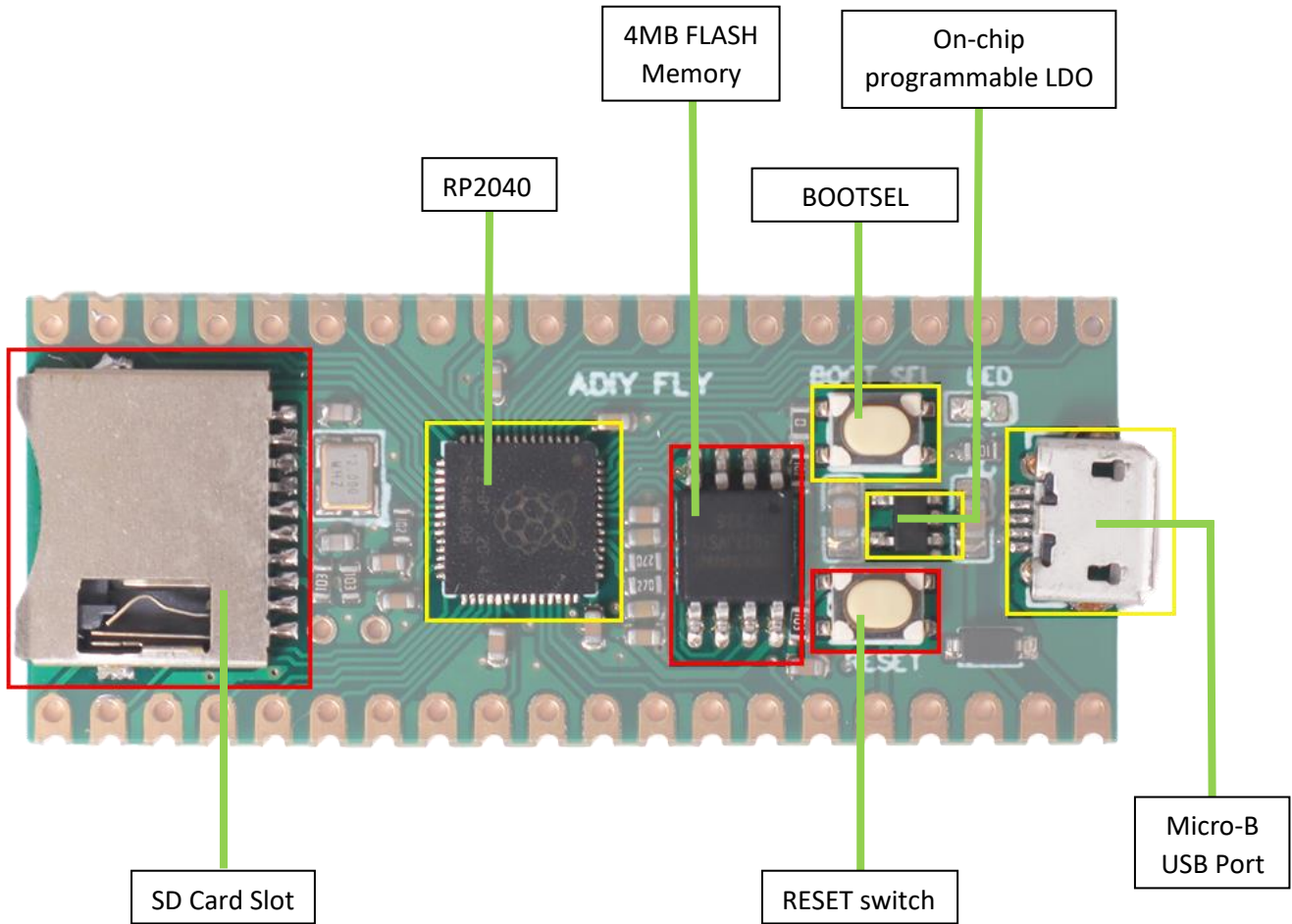
VSYS is the main system input voltage, which can vary in the allowed range of 1.8V to 5.5V, and is used by the on board ADIY FLY LDO voltage regulator to generate 3.3V for the RP2040 and its GPIOs.

3V3 is the main 3.3V supply to RP2040 and its I/O pins, generated by the on board voltage regulator. This pin can be used to power external circuitry (maximum output current will depend on RP2040 load and VSYS voltage, it is recommended to keep the load on this pin less than 300mA).

GP29_A3 (ADC_VREF) is the ADC power supply (and reference) voltage, and is generated on board by filtering the 3.3V supply. This pin can be used with an external reference if better ADC performance is required.

AGND is the ground reference for GPIO26-29, there is a separate analog ground plane running under these signals and terminating at this pin. If the ADC is not used or ADC performance is not critical, this pin can be connected to a digital ground.

Hardware Overview



RP2040 is Dual-core ARM Cortex M0+ processor, with a flexible clock running up to 133 MHz. RP2040 has a dual M0+ processor cores, DMA, internal memory and peripheral blocks connected via AHB/APB bus fabric. Code may be executed directly from external memory through a dedicated SPI, DSPI or QSPI interface. A small cache improves performance for typical applications. Debug is available via the SWD interface. Internal SRAM can contain code or data. It is addressed as a single 264 kB region.

RESET button on ADIY FLY can be used to reset the module without stopping programming.

BOOTSEL button is used to boot the device. While pressing the **BOOTSEL** button, hold it while you connect the other end of the micro USB cable to your computer. This puts your ADIY FLY into USB mass storage device mode.

The MICRO-B USB Port can be used to access the USB bootloader (**BOOTSEL** mode) stored in the RP2040 boot ROM. It can also be used by user code, to access an external USB device or host. RP2040 has an integrated USB1.1 PHY and controller which can be used in both Device and Host mode.

On-chip programmable LDO (3.3V, 0.6A, 600mA, CMOS LDO regulator) is a DC linear voltage regulator that can regulate the output voltage even when the supply voltage is very close to the output voltage. The advantages of an LDO regulator over other DC-to-DC voltage regulators include the absence of switching noise (as no switching takes place), smaller device size (as neither large inductors nor transformers are needed), and greater design simplicity (usually consists of a reference, an amplifier, and a pass element).

SD Card Slot has been installed in ADIY FLY for data storage purpose. 4MB serial Flash memory (25Q32JVSIQ 32M-bit) provides a storage solution for systems with limited space, pins and power. The device operates on 2.7V to 3.6V power supply with current consumption as low as 1 μ A for power-down.

ADIY FLY RP2040 Board

