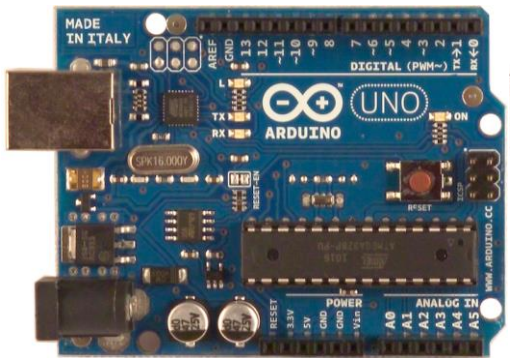
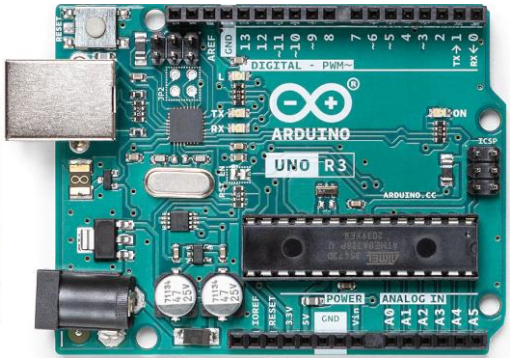
Arduino Uno Boards Technical Specifications

Arduino Uno R1 to R3



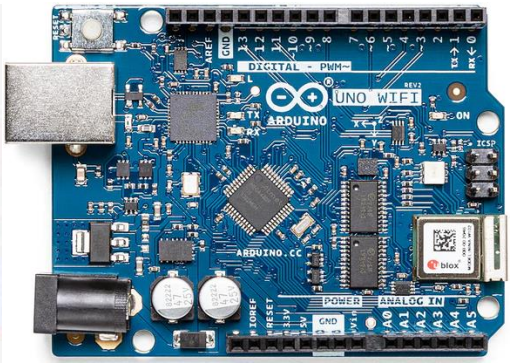
Arduino Uno DIP

Arduino Uno R2 DIP



Arduino Uno R3 DIP

Arduino Uno WiFi DIP



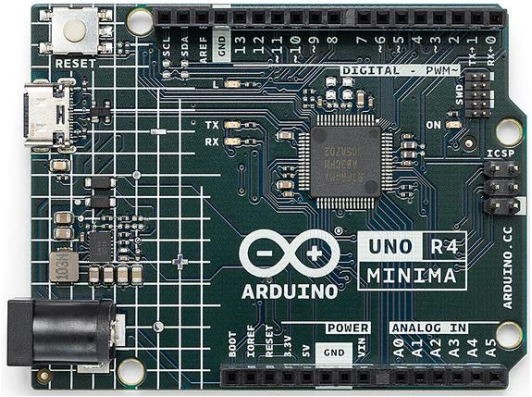
Arduino Uno R2 WiFi SMD

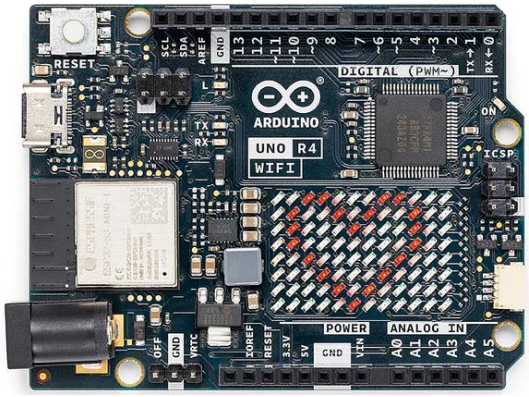
Microcontroller (MCU):

- IC: Microchip ATmega328P (8-bit AVR core)
- Clock Speed: 16 MHz on Uno board, though IC is capable of 20 MHz maximum at 5 Volts
- Flash Memory: 32 KB, of which 0.5 KB used by the bootloader
- SRAM: 2 KB
- EEPROM: 1 KB
- USART peripherals: 1 (Arduino software default configures USART as a 8N1 UART)
- SPI peripherals: 1

- I^2C peripherals: 1
- Operating Voltage: 5 Volts
- Digital I/O Pins: 14
- PWM Pins: 6 (Pin # 3, 5, 6, 9, 10 and 11)
- Analog Input Pins: 6
- DC Current per I/O Pin: 20 mA
- DC Current for 3.3V Pin: 50 mA
- Size: 68.6 mm x 53.4 mm
- Weight: 25 g
- ICSP Header: Yes
- Power Sources:
  - USB connector. USB bus specification has a voltage range of **4.75 to 5.25 volts**. The official Uno boards have a USB-B connector, but 3rd party boards may have a miniUSB / microUSB / USB-C connector.
  - 5.5mm/2.1mm barrel jack connector. Official Uno boards support **6 to 20 volts**, though **7 to 12 volts** is recommended. The maximum voltage for 3rd party Uno boards varies between board manufactures because various voltage regulators are used, each having a different maximum input rating. Power into this connector is routed through a series diode before connecting to **VIN** to protect against accidental reverse voltage situations.
  - VIN pin on shield header. It has a similar voltage range of the barrel jack. Since this pin doesn't have reverse voltage protection, power can be injected or pulled from this pin. When supplying power into VIN pin, an external series diode is required in case barrel jack is used. When board is powered by barrel jack, power can be pulled out of this pin.
- Boards with ATmega328P MCU in DIP-28 package
- Board with ATmega4809 MCU in SMD package

Arduino Uno R4





Arduino UNO R4 Minima Arduino UNO R4 WiFi

Two Uno R4 boards are available: Uno R4 Minima and Uno R4 WiFi.

The later has a WiFi coprocessor and LED matrix, but the Minima doesn't.

Common features on both Uno R4 Minima and Uno R4 WiFi boards:

Microcontroller (MCU):

- IC: Renesas R7FA4M1AB (32-bit ARM Cortex-M4F core with single-precision FPU)
- Clock Speed: 48 MHz
- Flash Memory: 256 KB + bootrom
- SRAM: 32 KB (16 KB ECC) (16 KB parity)
- EEPROM: 8 KB (data flash)
- USART peripherals: 4
- SPI peripherals: 2
- I^2C peripherals: 2
- Operating Voltage: 5 Volts

- USB-C connector.
- Barrel jack connector and VIN pin on shield header supports up to a maximum of 24 volts DC.

Additional features only available on the **Uno R4 Minima** board:

- SWD programming connector. This is a 10-pin 5x2 1.27mm header for connecting the microcontroller (R7FA4M1AB) to an external SWD (serial wire debug) programming / debugging device.

Additional features only available on the **Uno R4 WiFi** board:

- WiFi coprocessor - 240 MHz Espressif ESP32-S3-MINI (IEEE802.11 b/g/n WiFi and Bluetooth 5 LE) and a 6-pin 3x2 2.54mm header for external programming.
- 12x8 LED matrix - it is driven by 11 GPIO pins using a charlieplexing scheme.
- Qwiic I²C connector. This 4-pin 1.00mm JST SH connector provides external connection to a 3.3 volt I²C bus. Don't attach 5 volt I²C devices directly to this connector.
- RTC battery header pin (VRTC). This pin connects an external battery to the RTC (real-time clock) inside the microcontroller (R7FA4M1AB) to keep clock running when board is powered down. Connect this pin to positive side of 1.6 to 3.6 volt battery and negative side of battery to ground header pin (GND), such as a 3 volt lithium coin battery.
- Remote-Off header pin (OFF). This pin disables the 5 volt buck switching voltage regulator (SL854102) when powered the barrel jack or VIN header pin. Connect this pin to ground header pin (GND) to disable this voltage regulator.

References

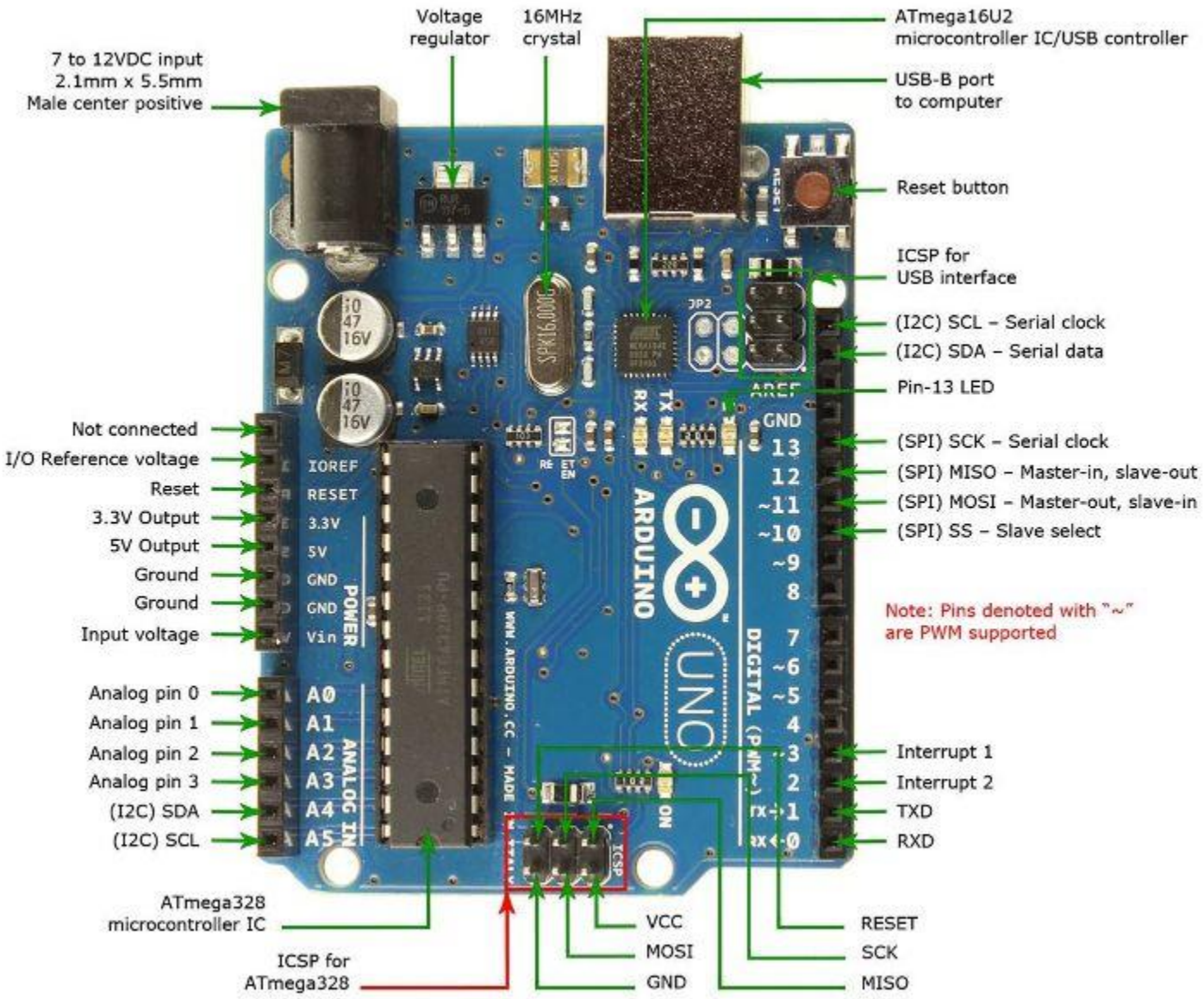
[1]An overview of different UNO boards, https://support.arduino.cc/hc/en-us/articles/7901453165724-An-overview-of-different-UNO-boards , erişim 24.2.2024.

[2]Arduino Uno, https://en.wikipedia.org/wiki/Arduino_Uno ,erişim 24.2.2024.

[3]Comparison of single-board microcontrollers, https://en.wikipedia.org/wiki/Comparison_of_single-board_microcontrollers ,erişim 24.2.2024.

[4]Arduino Uno Pinout, https://www.jameco.com/Jameco/workshop/CircuitNotes/CN-Arduino-uno.html ,erişim 24.2.2024.

Arduino Uno Geliştirme Kartı (Orjinal DIP MCU)



Arduino Uno Geliştirme Kartı (Eğitim Sistemi)