

The Arduino Mega 2560 R3



The Arduino Mega is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. Never fear for accidental electrical discharge, either since the Mega also includes a plastic base plate to protect it!

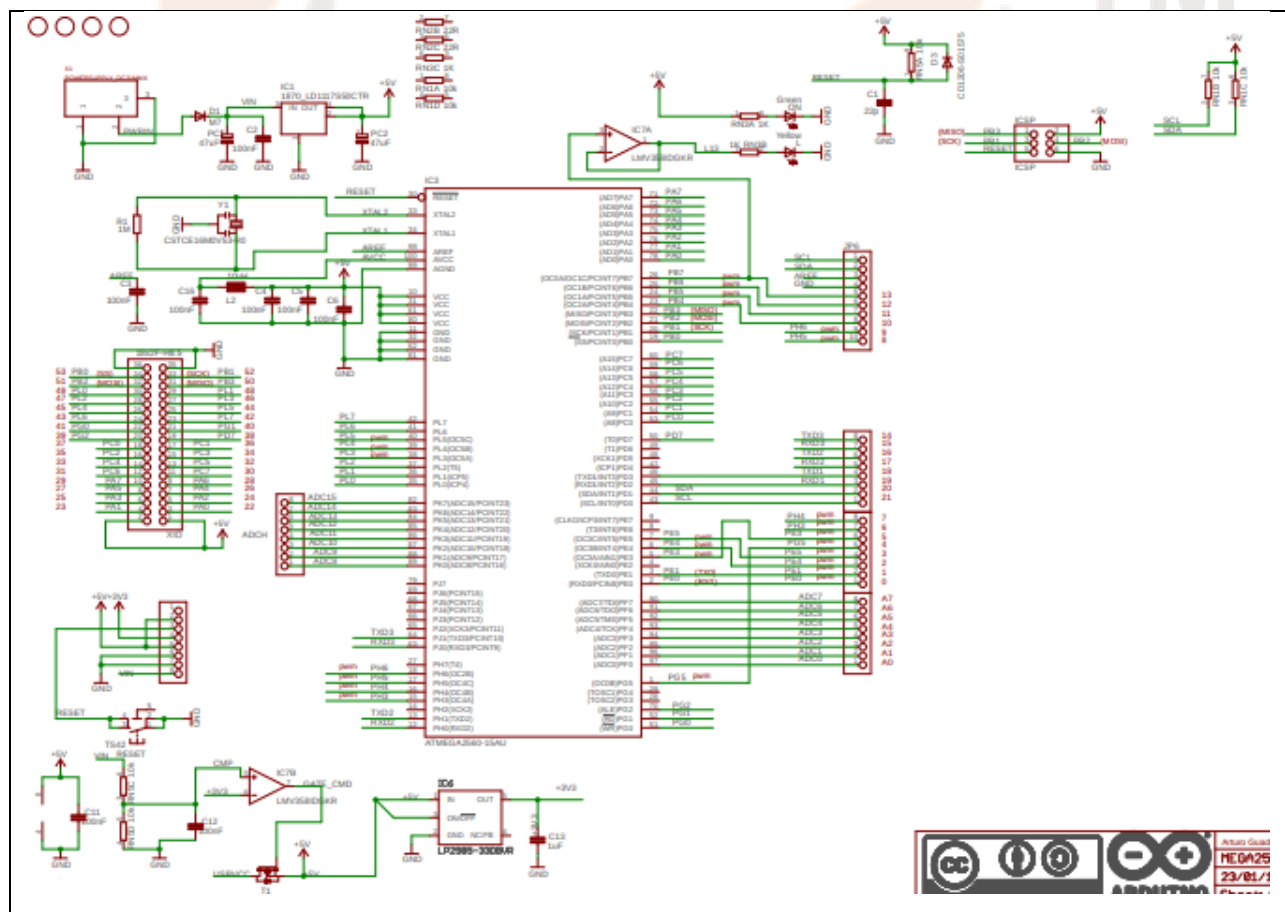
The Mega 2560 R3 also adds SDA and SCL pins next to the AREF. In addition, there are two new pins placed near the RESET pin. One is the IOREF that allow the shields to adapt to the voltage provided from the board. The other is a not connected and is reserved for future purposes. The Mega 2560 R3 works with all existing shields but can adapt to new shields which use these additional pins.

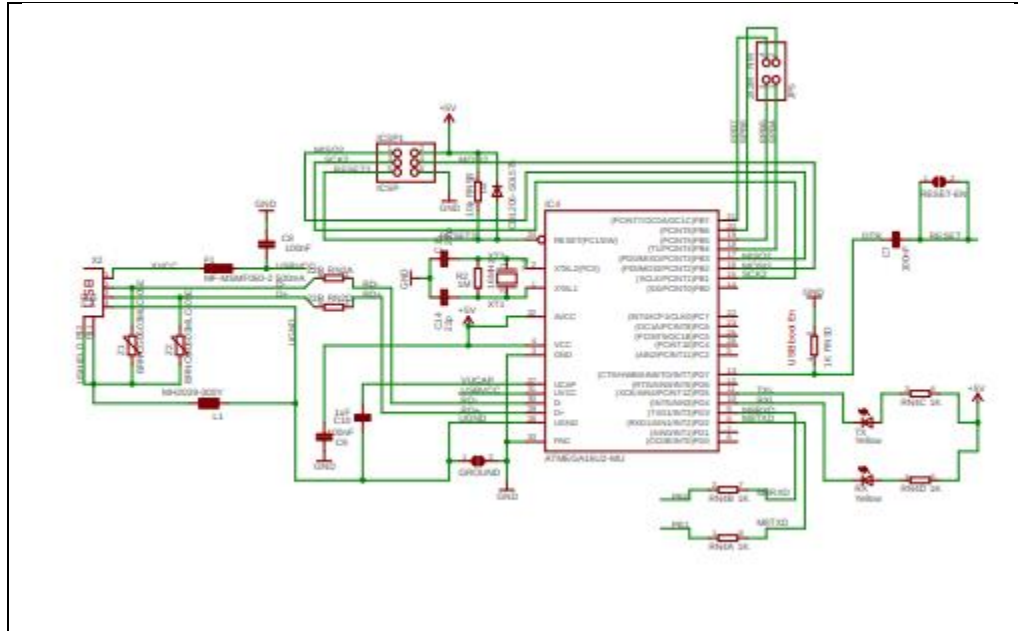
SPECIFICATIONS:

- Microcontroller: ATmega2560
- Operating Voltage: 5V
- Input Voltage(recommended): 7-12V
- Input Voltage(limit): 6-20V
- Digital I/O Pins: 54(of which 15 provide PWM output)
- Analog Input Pins:16
- DC Current per I/O Pin: 20ma
- DC Current for 3.3V Pin: 50ma
- Flash Memory: 256kb(ATmega2560) of which 8kb used by bootloader

- SRAM: 8KB
- EEPROM: 4kb
- Clock Speed: 16MHz
- LED_BUILTIN: 13
- Size: 101.52x53.3mm
- Weight: 37g

SCHEMATIC DIAGRAM OF ARDUINO MEGA 2560 R3:





Every pin of this board comes by a particular function which is allied with it. All analog pins of this board can be used as digital I/O pins. By using this board, the Arduino mega projected can be designed. These boards offer flexible work memory space is the more & processing power that permits to work with different types of sensors without delay.

- Power Supply:** These pins are used for providing o/p regulated voltage approximately 5V. This RPS (regulated power supply) provides the power to the microcontroller as well as other components which are used over the Arduino mega board. It can be attained from Vin-pin of the board or one more regulated voltage supply-5V otherwise USB cable, whereas another voltage regulation can be offered by 3.3V0-pin. The max power can be drawn by this is 50mA.

GND Pin: The Arduino mega board includes 5-GND pins where one of these pins can be used whenever the project requires.

Reset (RST) Pin: The RST pin of this board can be used for rearranging the board. The board can be rearranged by setting this pin to low.

Vin Pin: The range of supplied input voltage to the board ranges from 7volts to 20volts. The voltage provided by the power jack can be accessed through this pin. However, the output voltage through this pin to the board will be automatically set up to 5V.

- Serial Communication:** The serial pins of this board like TXD and RXD are used to transmit & receive the serial data. Tx indicates the transmission of information whereas the RX indicates receive data. The serial pins of this board

have four combinations. For serial 0, it includes Tx (1) and Rx (0), for serial 1, it includes Tx(18) & Rx(19), for serial 2 it includes Tx(16) & Rx(17), and finally for serial 3, it includes Tx(14) & Rx(15).

- **External Interrupts:** The external interrupts can be formed by using 6-pins like interrupt 0(0), interrupt 1(3), interrupt 2(21), interrupt 3(20), interrupt 4(19), interrupt 5(18). These pins produce interrupts by a number of ways i.e. Providing LOW value, rising or falling edge or changing the value to the interrupt pins.
- **LED:** This Arduino board includes a LED and that is allied to pin-13 which is named as digital pin 13. This LED can be operated based on the high and low values of the pin. This will give you to modify the programming skills in real time.
- **AREF:** The term AREF stands for Analog Reference Voltage which is a reference voltage for analog inputs.
- **Analog Pins:** There are 16-analog pins included on the board which is marked as A0-A15. It is very important to know that all the analog pins on this board can be utilized like digital I/O pins. Every analog pin is accessible with the 10-bit resolution which can gauge from GND to 5 volts. But, the higher value can be altered using AREF pin as well as the function of analog Reference ().
- **I2C:** The I2C communication can be supported by two pins namely 20 & 21 where 20-pin signifies Serial Data Line (SDA) which is used for holding the data & 21-pin signifies Serial Clock Line (SCL) mostly utilized for offering data synchronization among the devices.
- **SPI Communication:** The term SPI is a serial peripheral interface which is used to transmit the data among the controller & other components. Four pins like MISO (50), MOSI (51), SCK (52), and SS (53) are utilized for the communication of SPI.