RedBoard Qwiic (DEV-15123)

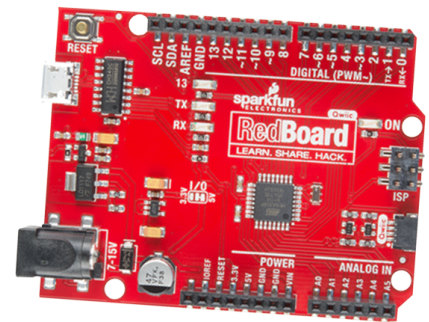## Combines Arduino R3 compatibility with the design ease of the Qwiic ecosystem

Product Overview
05-02-2022
For the most up-to-date information, visit www.mouser.com or the supplier's website.

Description

The RedBoard Qwiic (DEV-15123) from SparkFun combines Arduino R3 Shield compatibility with the design ease of the Qwiic Connect ecosystem. Featuring a robust 3.3V Voltage Regulator, the RedBoard Qwiic offers plenty of power to daisy chain multiple Qwiic Breakout Boards and Sensors, sourcing up to 600mA of current. The RedBoard Qwiic also offers hardware peripherals, including 20 Digital I/O pins with 6 PWM pins, UART, SPI, and external interrupts. Programming the RedBoard Qwiic is handled over USB, using the UNO option in the Arduino IDE. The SparkFun Qwiic Connect System is an ecosystem of I²C sensors, actuators, shields, and cables that make prototyping faster and less prone to error. All Qwiic-enabled boards use a common 1mm pitch, 4-pin JST connector. This reduces the amount of required PCB space, and polarized connections mean the user can't hook it up wrong.
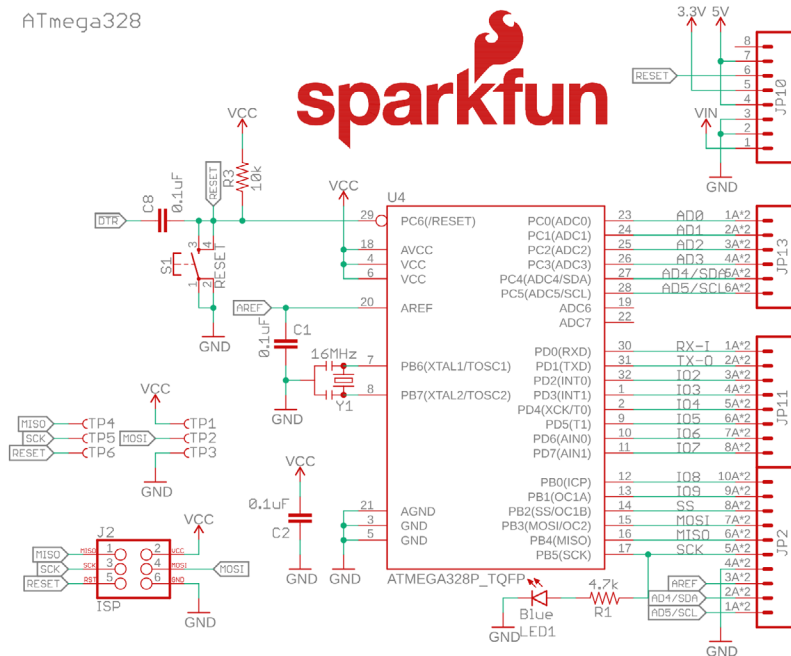
Features

- Microchip Technology ATmega328 Microcontroller with Optiboot (UNO) Bootloader
- CH340C Serial-USB Converter
- Diodes Incorporated AP2112 LDO Voltage Regulator
- A4/A5 Jumpers
- RX/TX LED Color Change
- 3.3V to 5V Voltage Level Jumper
- 7V to 15V Input Voltage
- 1 Qwiic Connector
- USB Micro-B
- 20 Digital I/O Pins (6 PWM Outputs and 6 Analog Inputs)
- ISP Header
- 32k Flash Memory
- 16MHz Clock Speed
- All SMD Construction
- R3 Shield Compatible
- Improved Reset Button

ATmega328

U4 ATMEGA328P_TQFP

29 PC6(/RESET)
18 AVCC
4 VCC
6 VCC
20 AREF
7 PB6(XTAL1/TOSC1)
8 PB7(XTAL2/TOSC2)
21 AGND
3 GND
5 GND

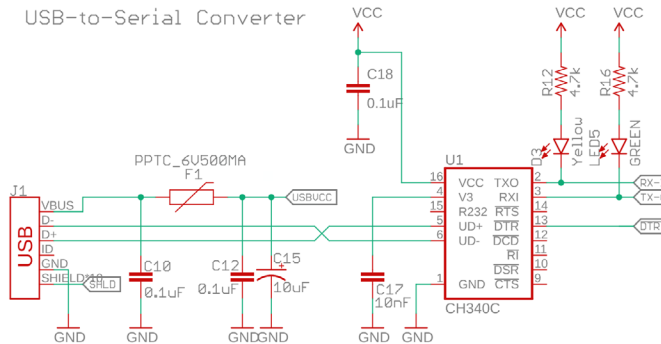PC0(ADC0) 23 AD0 1A*2
PC1(ADC1) 24 AD1 2A*2
PC2(ADC2) 25 AD2 3A*2
PC3(ADC3) 26 AD3 4A*2
PC4(ADC4/SDA) 27 AD4/SDA 5A*2
PC5(ADC5/SCL) 28 AD5/SCL 6A*2
ADC6 19
ADC7 22

PD0(RXD) 30 RX-I 1A*2
PD1(TXD) 31 TX-O 2A*2
PD2(INT0) 32 IO2 3A*2
PD3(INT1) 1 IO3 4A*2
PD4(XCK/T0) 2 IO4 5A*2
PD5(T1) 9 IO5 6A*2
PD6(AIN0) 10 IO6 7A*2
PD7(AIN1) 11 IO7 8A*2

PB0(ICP) 12 IO8 10A*2
PB1(OC1A) 13 IO9 9A*2
PB2(SS/OC1B) 14 SS 8A*2
PB3(MOSI/OC2) 15 MOSI 7A*2
PB4(MISO) 16 MISO 6A*2
PB5(SCK) 17 SCK 5A*2

JP10 — 3.3V 5V, RESET, VIN, GND
JP13, JP11, JP2

C8 0.1uF, R3 10k, S1 RESET, C1 0.1uF, Y1 16MHz, C2 0.1uF
R1 4.7k, Blue LED1

TP4 MISO, TP5 SCK, TP6 RESET, TP1, MOSI TP2, TP3
J2 ISP — MISO, SCK, RESET, MOSI, VCC, RST

Power Supply

VIN Range: 7-15V
D1 1A/40V/500mV
LM1117 IN OUT ADJ IC3
C5 47uF, R15 240, R14 715
R4 10k, USBVCC
Q1 1A/60V/500mΩ
5V
C3 10uF, C4 0.1uF
R2 10k, LED2 GREEN
VCC

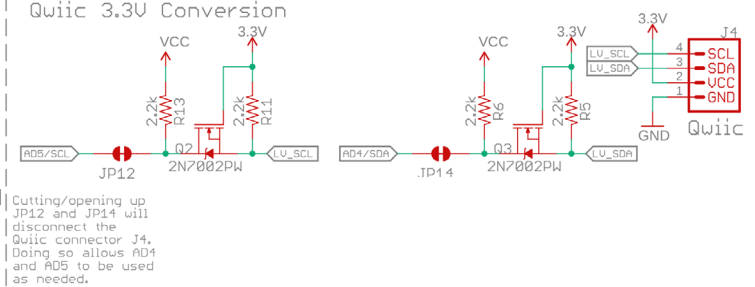U3 AP2112-3.3V — IN OUT, EN, GND NC
3.3V 600mA Out
C16 1.0uF, C6 10uF

Board I/O Voltage

To convert the board to 3.3V you must cut the jumper to 5V and use solder to close the jumper towards 3.3V.

I/O 3.3V 5V

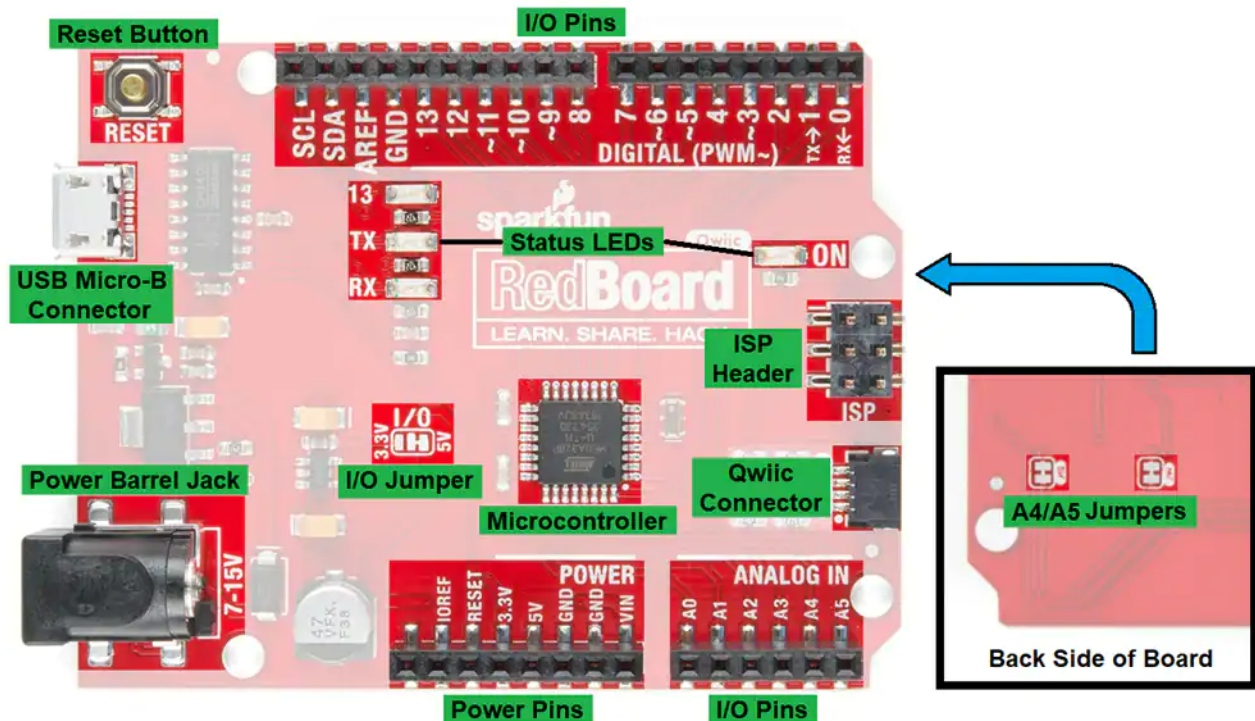open hardware

USB-to-Serial Converter

J1 USB — VBUS, D-, D+, ID, GND, SHIELD
PPTC_6V500MA F1
C18 0.1uF
C10 0.1uF, C12 0.1uF, C15 10uF, C17 10nF

U1 CH340C
16 VCC TXO 2
5 V3 RXI 3
15 R232 RTS 14
UD+ DTR 13
6 UD- DCD 12
RI 11
DSR 10
1 GND CTS 9

RX-I, TX-O, DTR
R12 4.7k, R16 4.7k
LED3 Yellow, LED5 GREEN
VCC

Qwiic 3.3V Conversion

VCC 3.3V
R13 2.2k, R11 2.2k
Q2 2N7002PW
AD5/SCL, JP12, LV_SCL

VCC 3.3V
R6 2.2k, R5 2.2k
Q3 2N7002PW
AD4/SDA, JP14, LV_SDA

J4 Qwiic
4 SCL
3 SDA
2 VCC
1 GND
LV_SCL, LV_SDA, 3.3V

Cutting/opening up JP12 and JP14 will disconnect the Qwiic connector J4. Doing so allows AD4 and AD5 to be used as needed.

Board Layout

Mouser Part Number

View Part

To learn more, visit https://www.mouser.com/new/sparkfun/sparkfun-redboard-qwiic/