

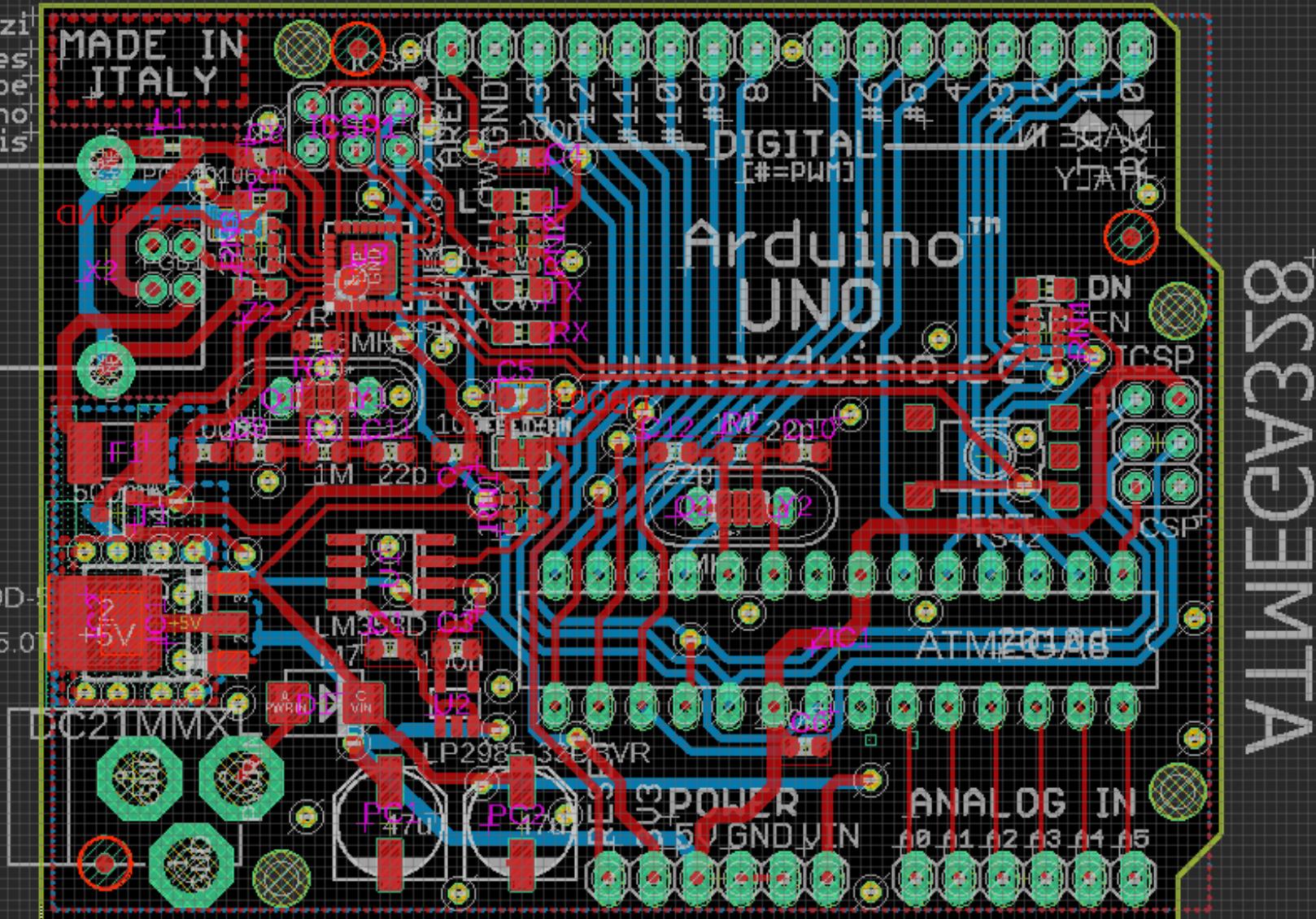
Electro workshop 4

Ing. Gabriel Války, PhD.

<https://x.valky.eu/elec4>

Arduino™ UNO Reference Design

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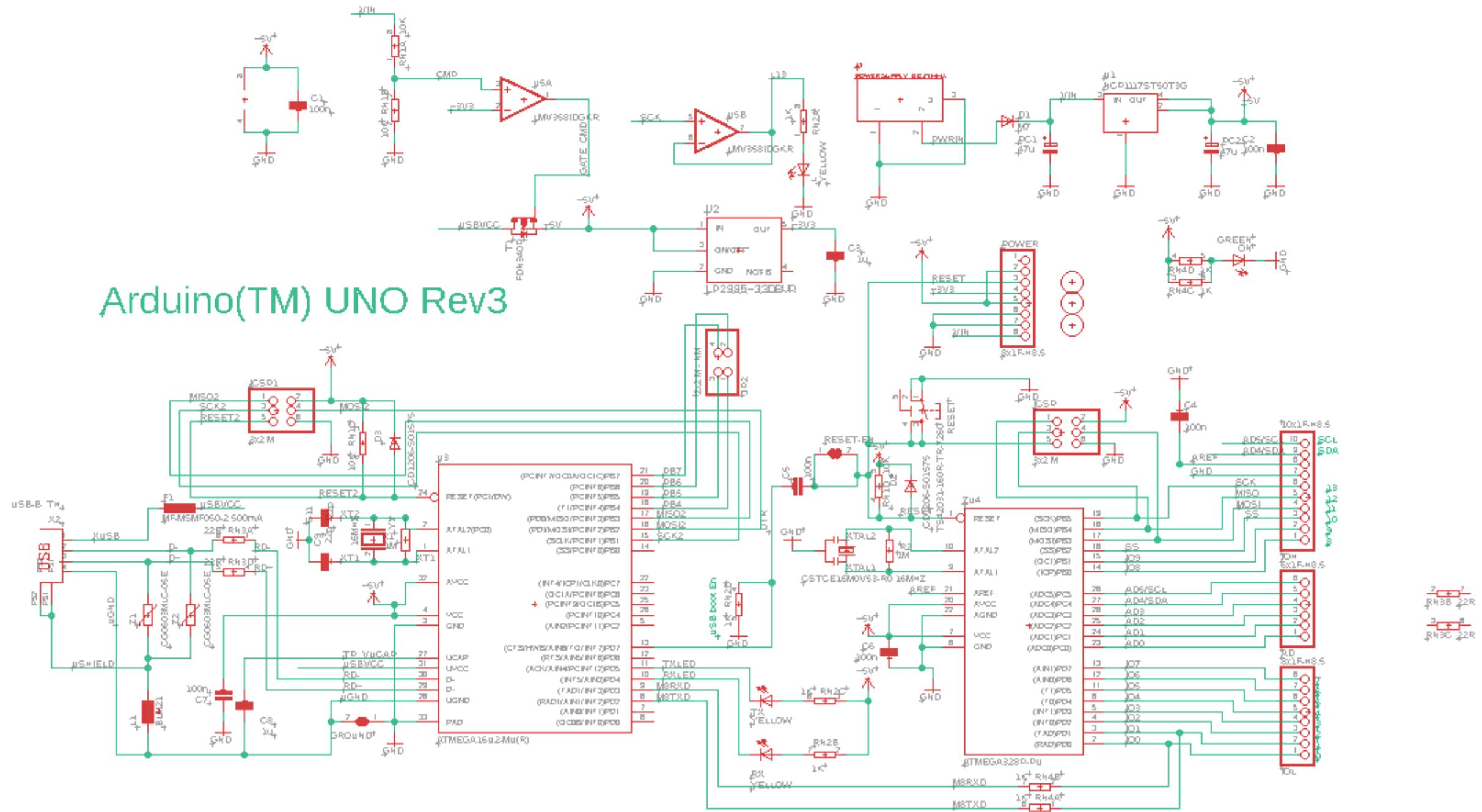


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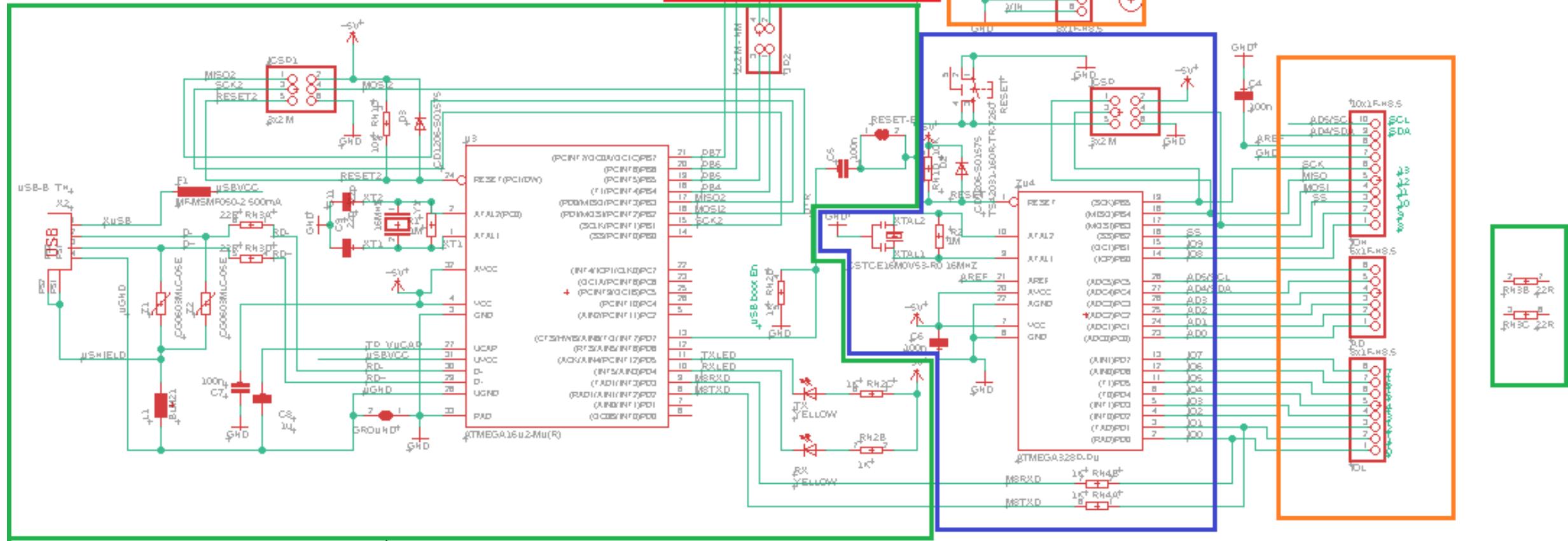
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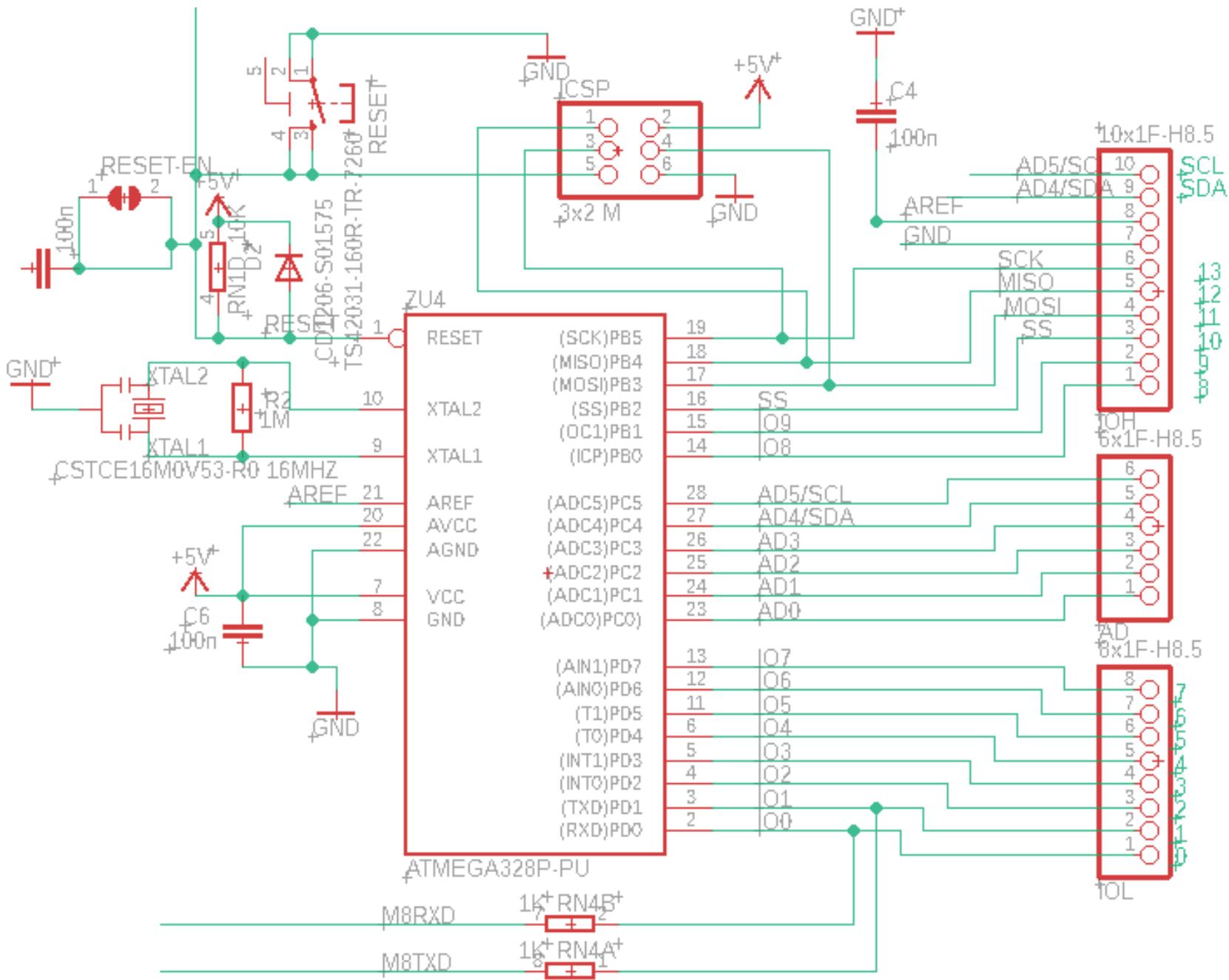
Arduino(TM) UNO Rev3



- Power Supply
- USB
- Microcontroller
- I/O

Arduino(TM) UNO Rev3





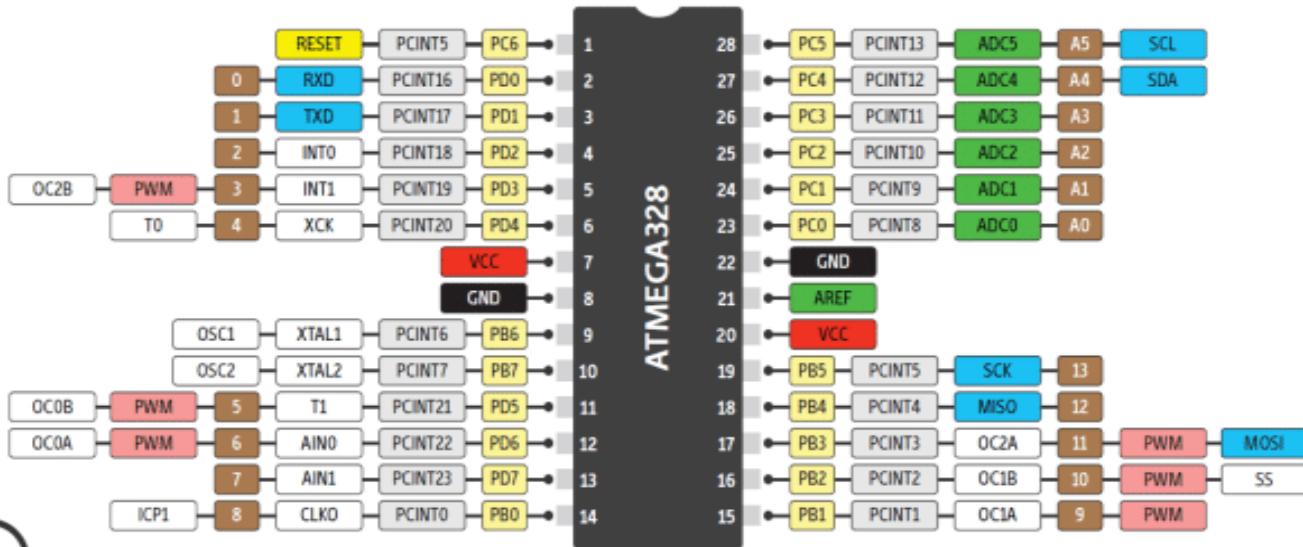


ATmega328P ☆

Status: In Production

[View Datasheets](#)[View Comparisons](#)[View CAD Symbols](#)

Device Overview



Parametrics

Name	Value
Program Memory Type	Flash
Program Memory Size (KB)	32
CPU Speed (MIPS/DMIPS)	20
SRAM (B)	2,048
Data EEPROM/HEF (bytes)	1024
Digital Communication Peripherals	1-UART, 2-SPI, 1-I2C
Capture/Compare/PWM Peripherals	1 Input Capture, 1 CCP, 6PWM
Timers	2 x 8-bit, 1 x 16-bit
Number of Comparators	1
Temperature Range (°C)	-40 to 85
Operating Voltage Range (V)	1.8 to 5.5
Pin Count	32
Low Power	Yes



ATtiny84 ☆

Newer Device Available ATTINY84A

Status: In Production

[View Datasheets](#)

[View Comparisons](#)

[View CAD Symbols](#)

Device Overview

Summary

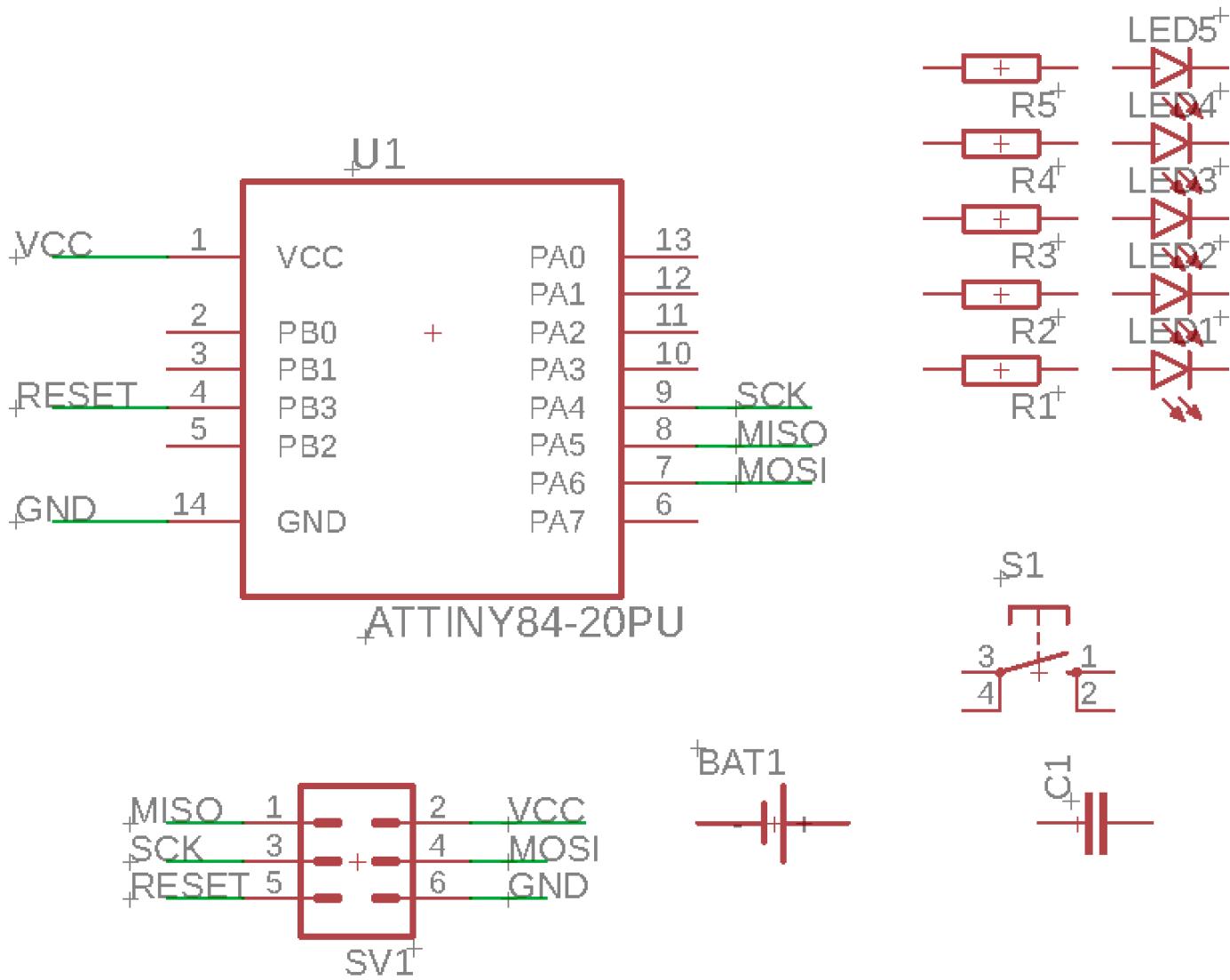
The high-performance, Microchip's picoPower® 8-bit AVR® RISC-based microcontroller combines 8KB ISP flash memory, 512-Byte EEPROM, 512-Byte SRAM, 12 general purpose I/O lines, 32 general purpose working registers, an 2 timers/counters (8-bit/16-bit) with two PWM channels each, internal and external interrupts, 8-channel 10-bit A/D converter, programmable gain stage (1x, 20x) for 12 differential ADC channel pairs, programmable watchdog timer with internal oscillator, internal calibrated oscillator, and four software selectable power saving modes. The device operates between 1.8-5.5 volts.

ATtiny44 / ATtiny84

(+) VCC	1	14	GND (-)
Pin 10	2	13	Pin 0 (Analog Input 0, AREF)
Pin 9	3	12	Pin 1 (Analog Input 1)
Reset	4	11	Pin 2 (Analog Input 2)
(PWM) Pin 8	5	10	Pin 3 (Analog Input 3)
(PWM, Analog Input 7) Pin 7	6	9	Pin 4 (Analog Input 4, SCK)
(MOSI, PWM, Analog Input 6) Pin 6	7	8	Pin 5 (Analog Input 5, PWM, MISO)

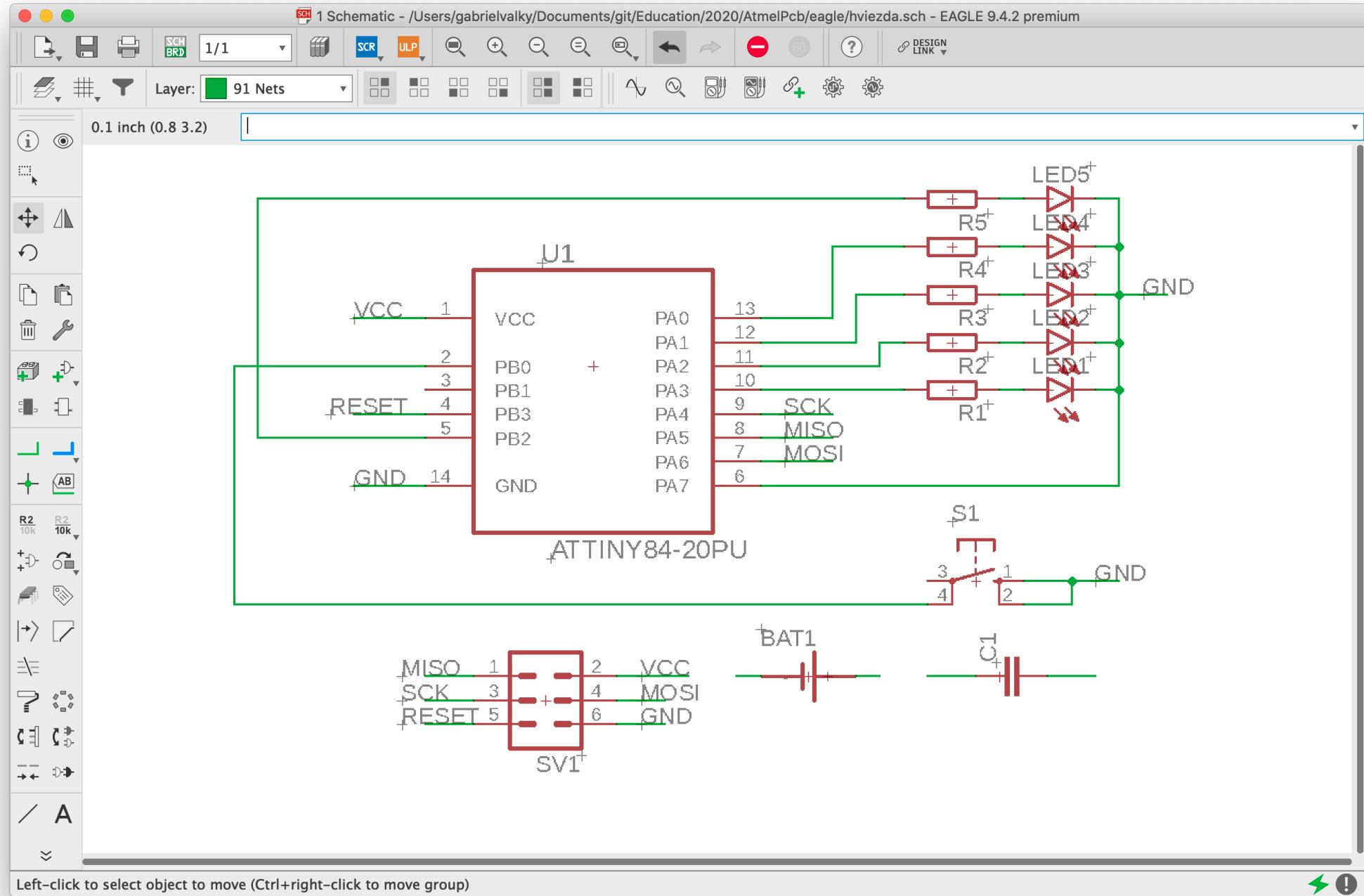
Parametrics

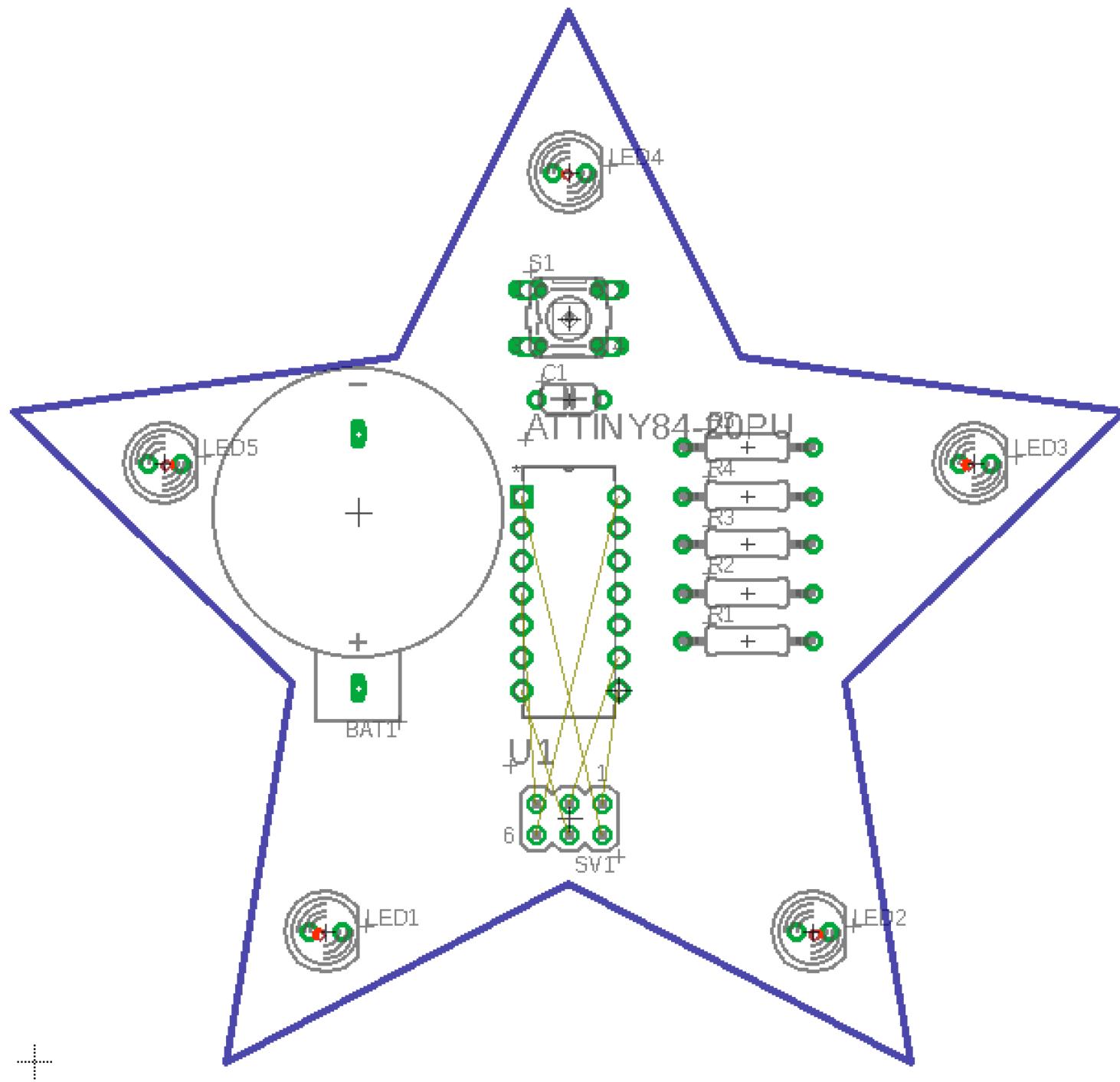
Name	Value
Program Memory Type	Flash
Program Memory Size (KB)	8
CPU Speed (MIPS/DMIPS)	20
SRAM (B)	512
Data EEPROM/HEF (bytes)	512
Digital Communication Peripheries	1-SPI, 1-I2C
Capture/Compare/PWM Peripherals	1 Input Capture, 1 CCP, 4PWM
Timers	1 x 8-bit, 1 x 16-bit
Number of Comparators	1
Temperature Range (°C)	-40 to 85
Operating Voltage Range (V)	1.8 to 5.5
Pin Count	14

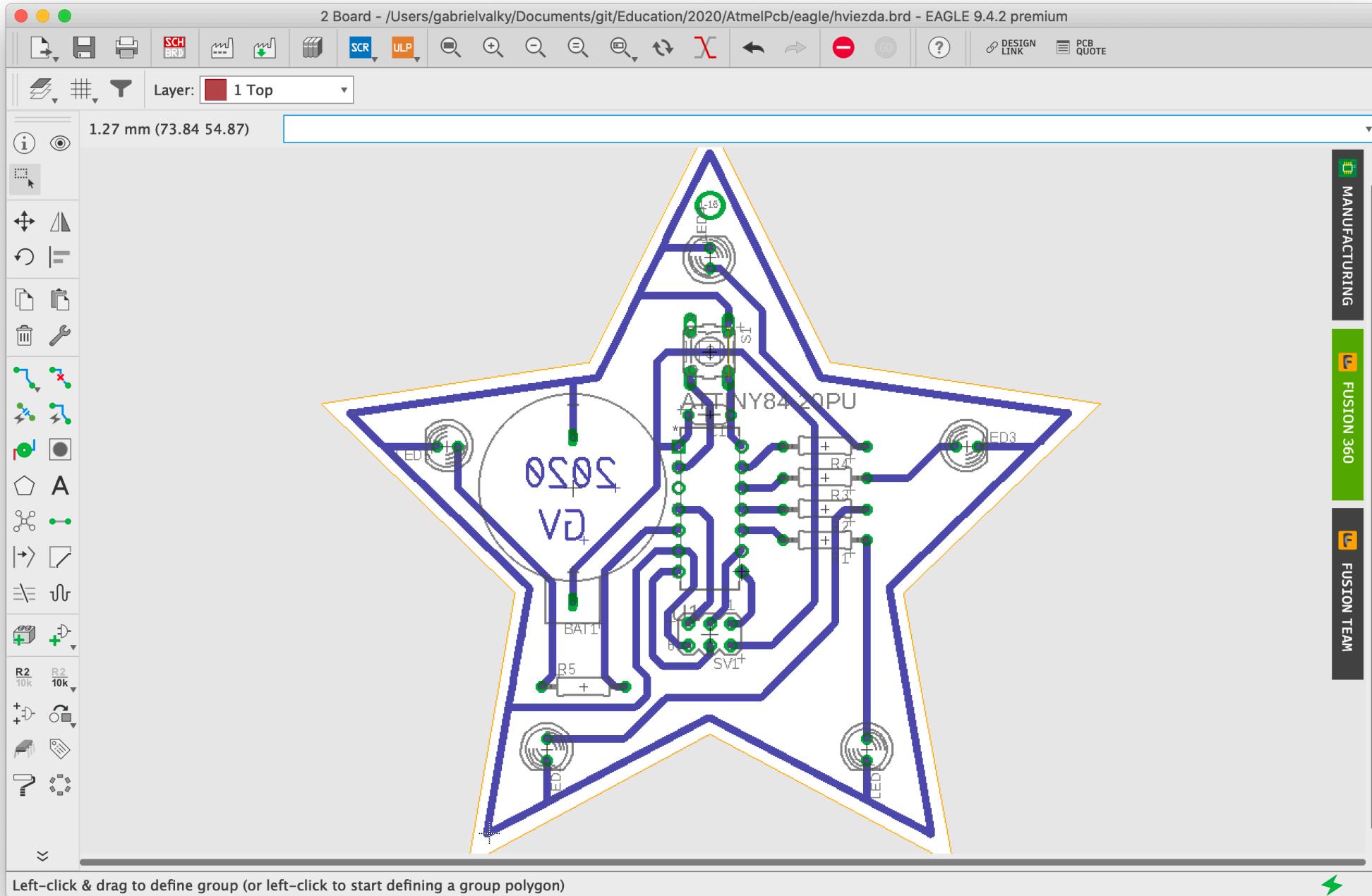


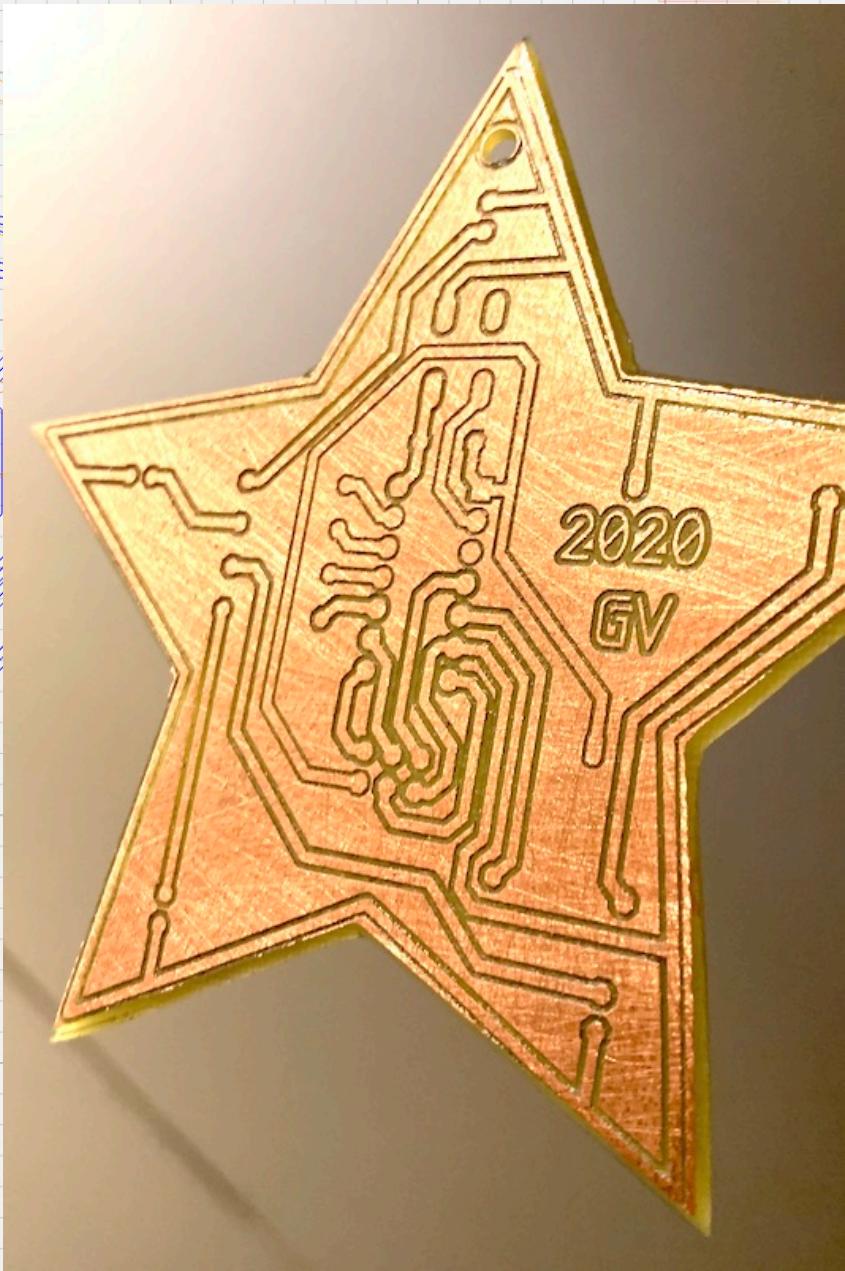
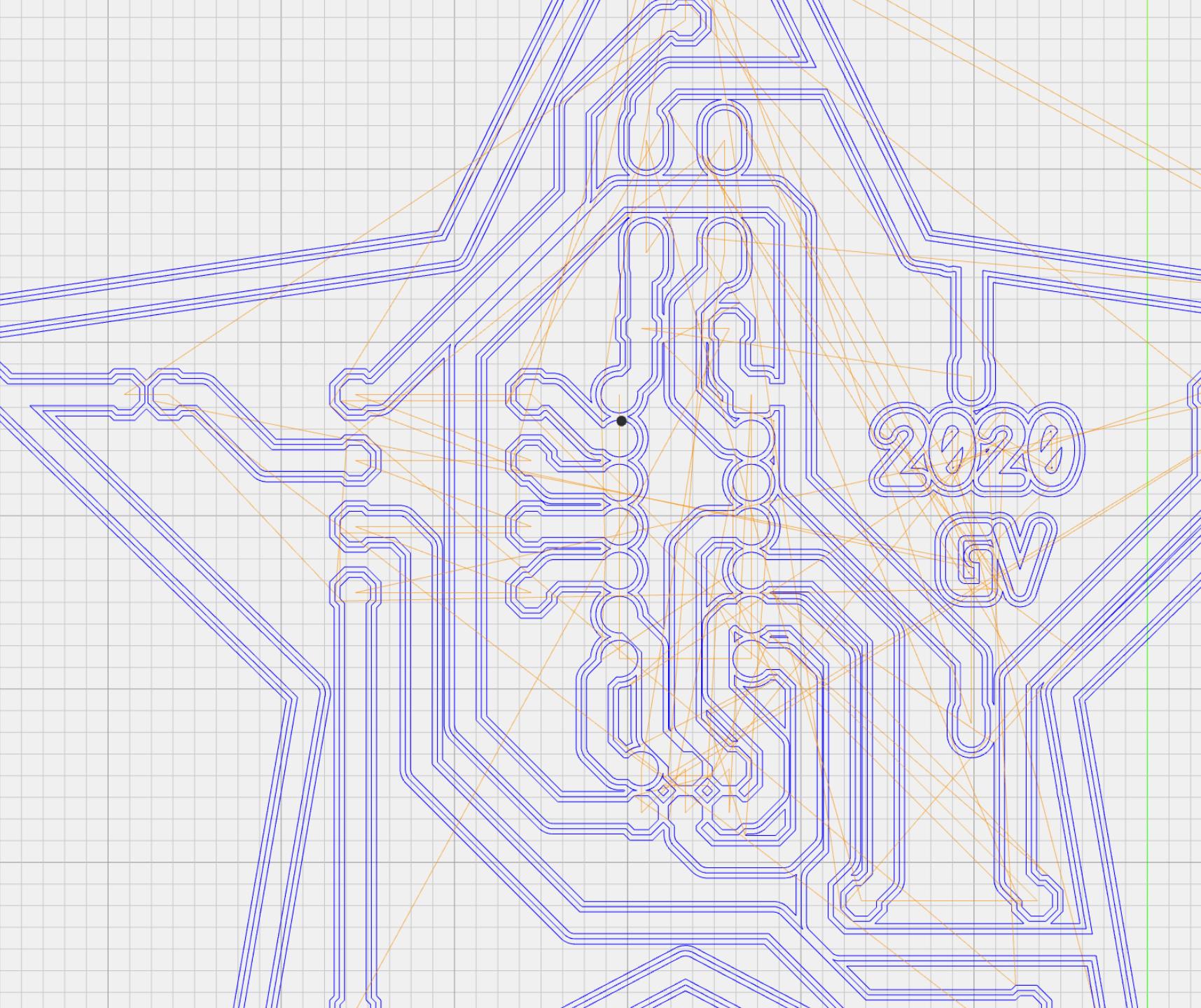
10 – R1 – LED1 – GND
 11 – R2 – LED2 – GND
 12 – R3 – LED3 – GND
 13 – R4 – LED4 – GND
 5 – R5 – LED5 – GND
 2 – S1 – GND
 GND – BAT1 – VDD
 GND – C1 – VDD

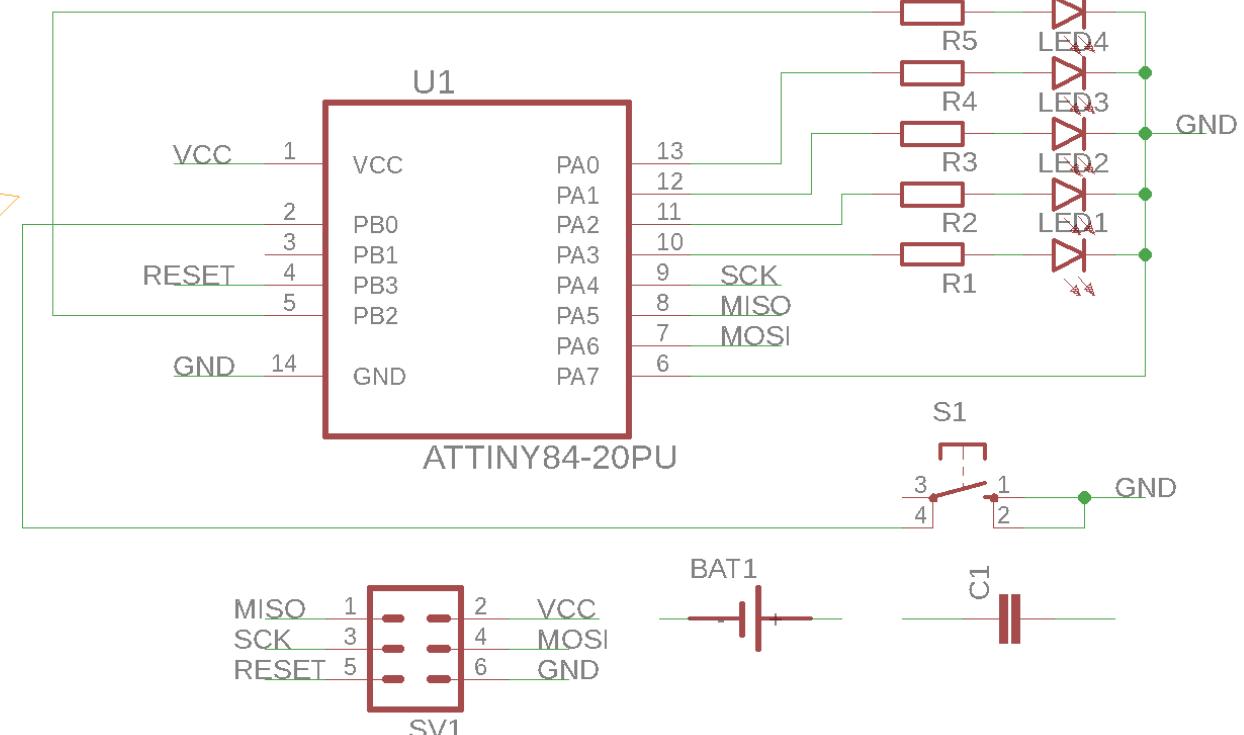
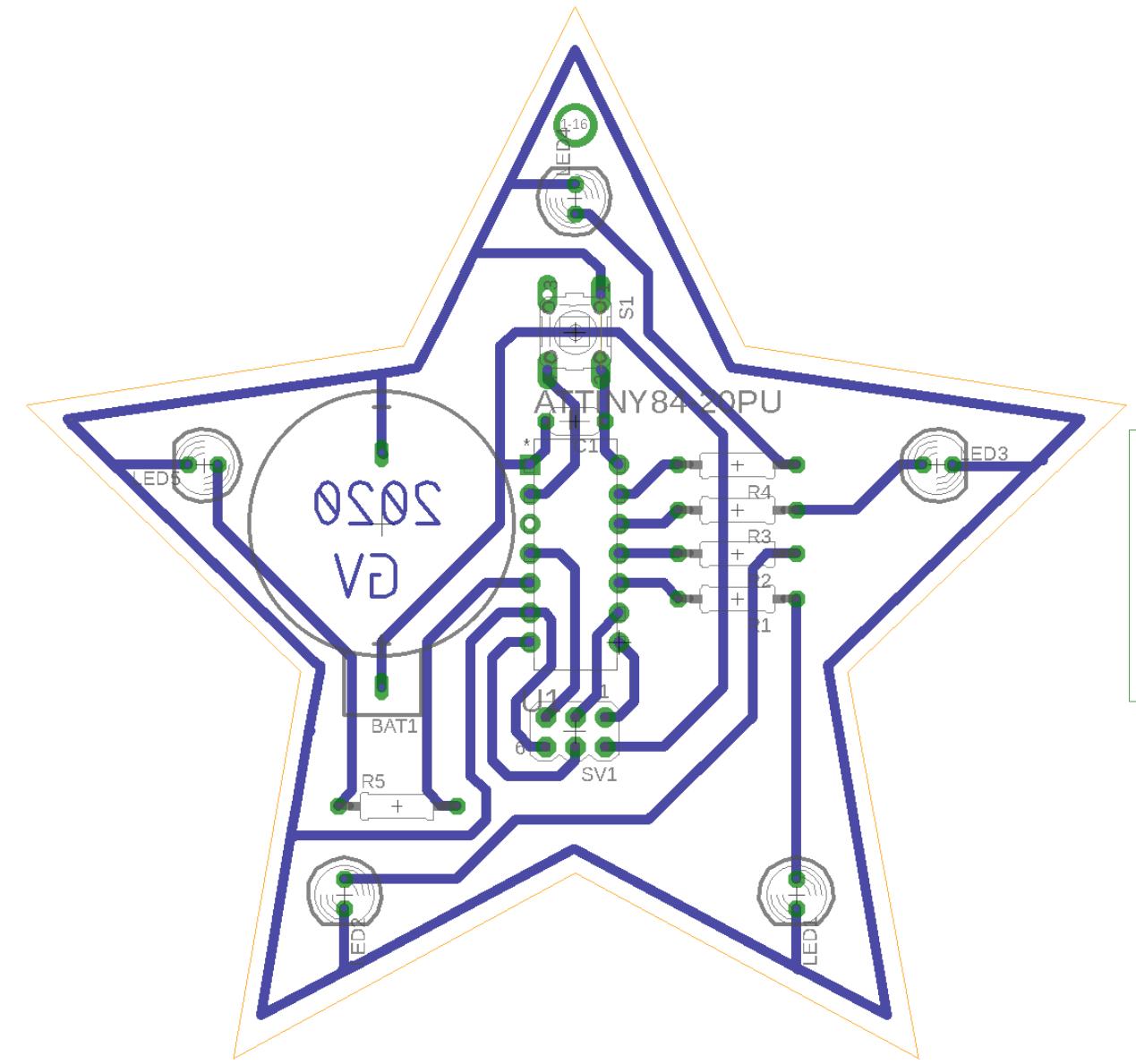
ICSP MISO – 8
 ICSP VCC – VCC
 ICSP SCK – 9
 ICSP MOSI – 7
 ICSP RESET – 4
 ICSP GND - GND

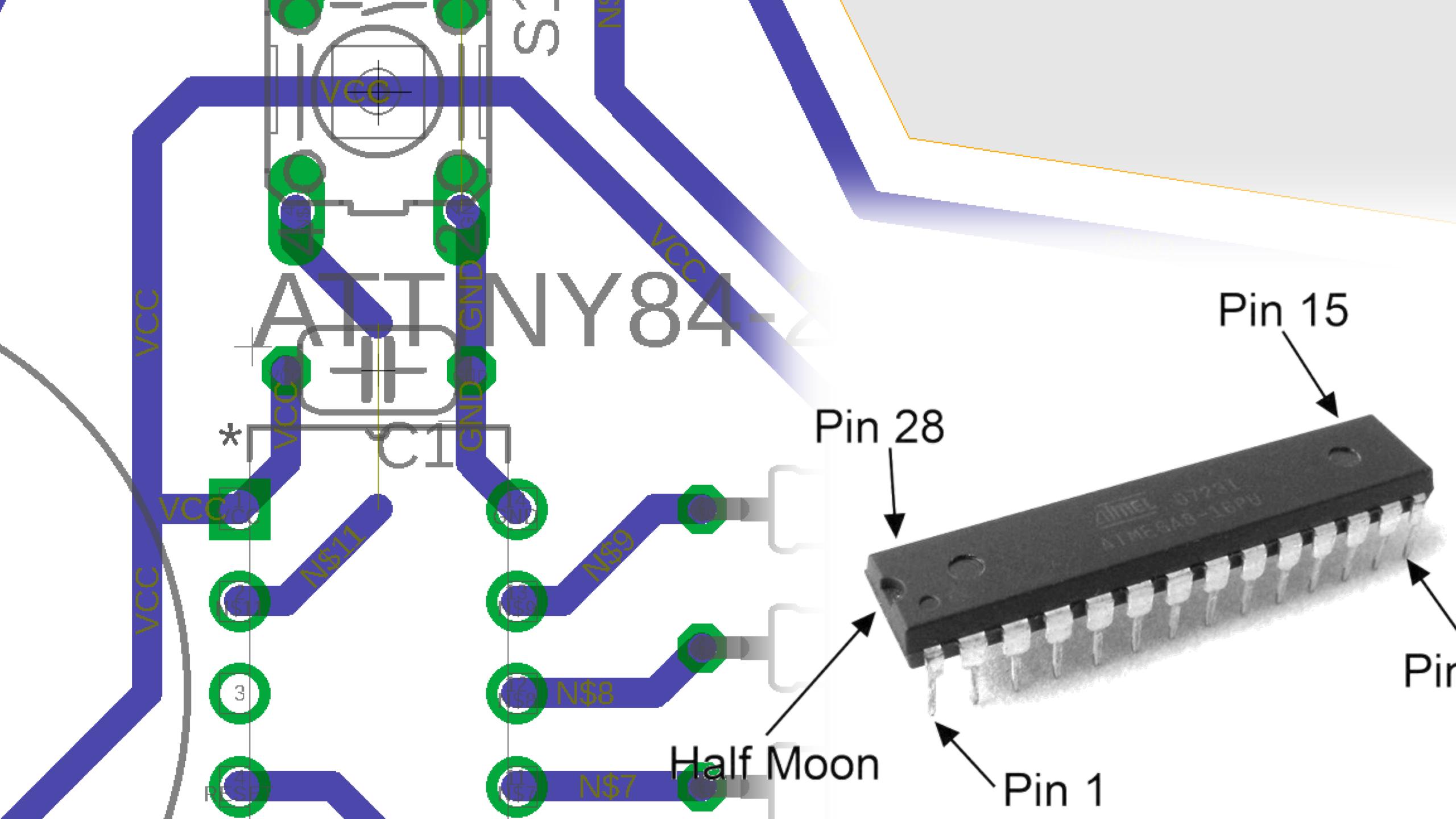


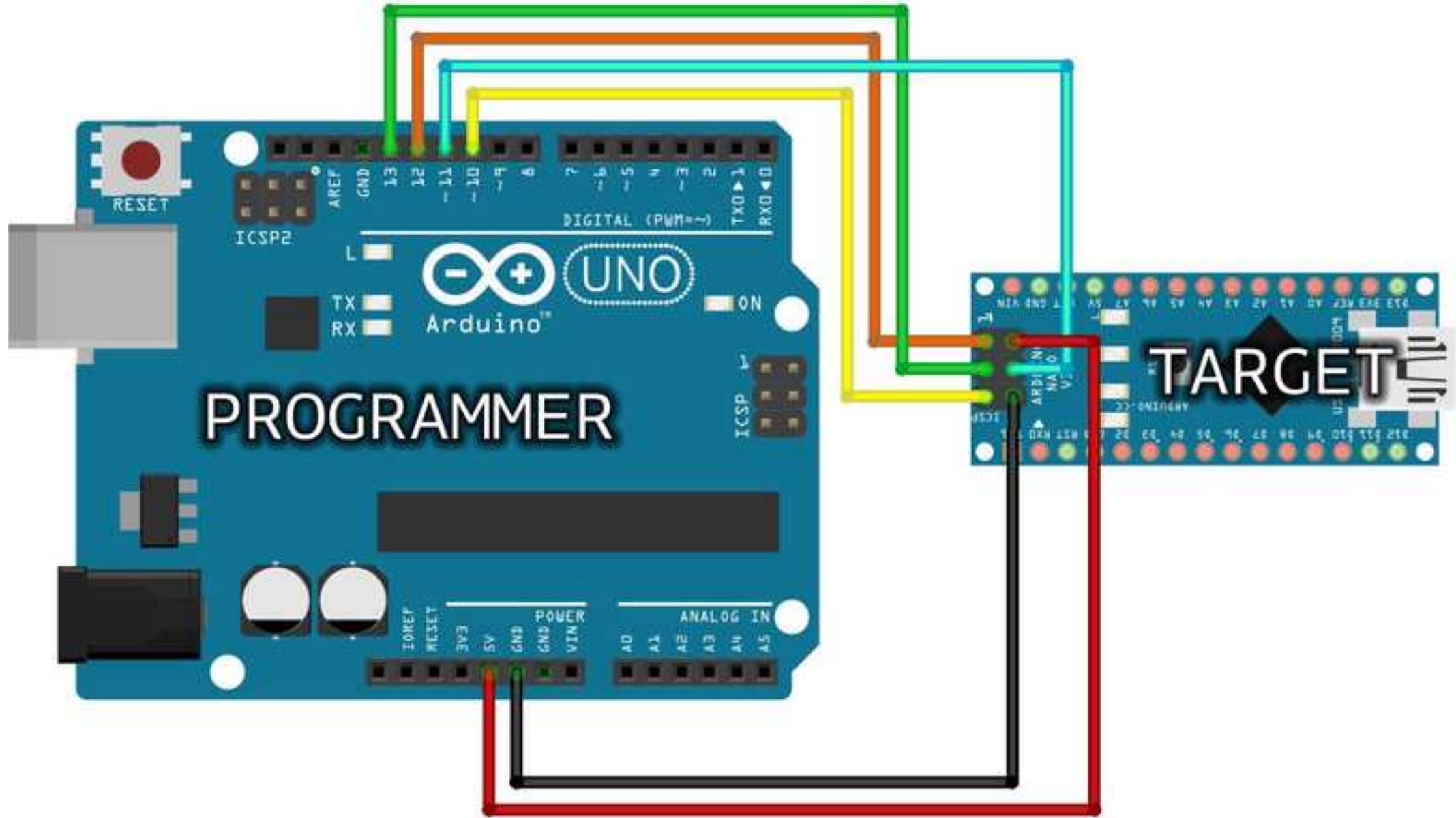


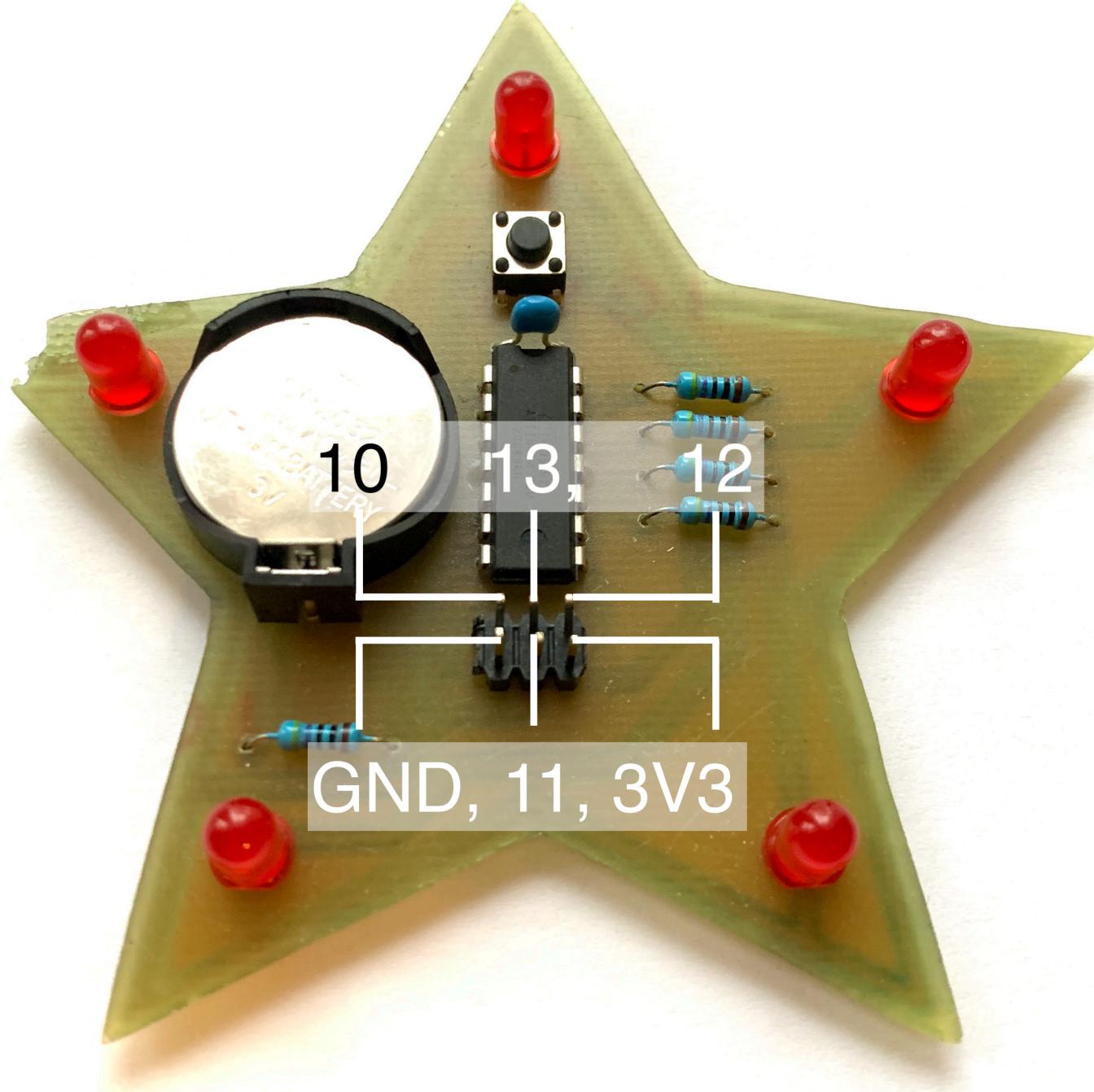










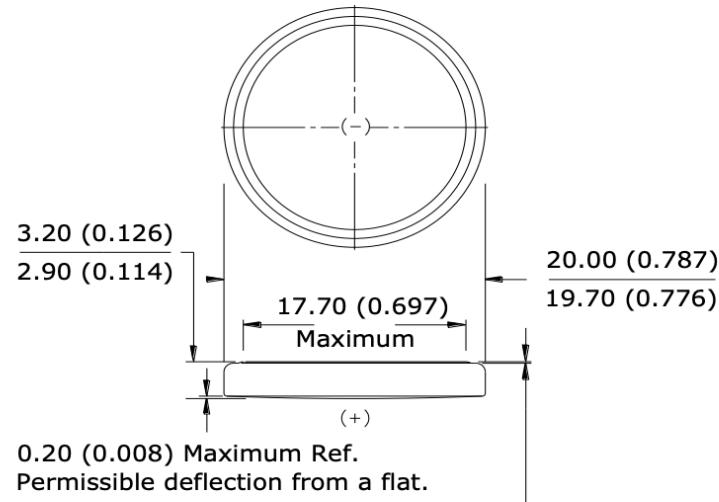


ENERGIZER CR2032



Industry Standard Dimensions

mm (inches)



0.10 (0.004) Minimum Ref.
(Applies to top edge of gasket or
edge of crimp, whichever is higher.)

Lithium Coin

Specifications

Classification:	"Lithium Coin"
Chemical System:	Lithium / Manganese Dioxide (Li/MnO ₂)
Designation:	ANSI / NEDA-5004LC, IEC-CR2032
Nominal Voltage:	3.0 Volts
Typical Capacity:	235 mAh (to 2.0 volts) (Rated at 15K ohms at 21°C)
Typical Weight:	3.0 grams (0.10 oz.)
Typical Volume:	1.0 cubic centimeters (0.06 cubic inch)
Max Rev Charge:	1 microampere
Energy Density:	198 milliwatt hr/g, 653 milliwatt hr/cc
Typical Li Content:	0.109 grams (0.0038 oz.)
Operating Temp:	-30C to 60C
Self Discharge:	~1% / year

Continuous Discharge Characteristics

Load: 15K ohms - continuous 21°C (70°F)
Typical Drain @ 2.9V: 0.19 mA

