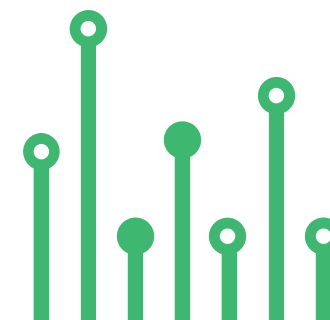


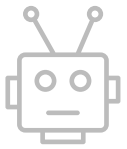
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Interactive LED Coffee Table – Arduino Compatible



SKU: EL130660



Interactive LED Coffee Table – Arduino Compatible

The project demonstrated here is an IR proximity sensor-based LED light, mainly designed for interactive coffee tables, but also can be used as single interactive light. The table can be made with multiple of these PCBs. Multiple tiles can be used as shown in the image below, each tile will light up when an object is placed over the sensor. Only the LEDs that are to the sensor area will light up. The project is Arduino compatible and consists of an ATMEGA328 chip, 16 x 5mm LEDs, ULN2803 multi-output driver for LEDs, IR Sensor, 5mm IR LED, and BC847 BJT transistor. The operating supply is 5V DC @ 200mA current.



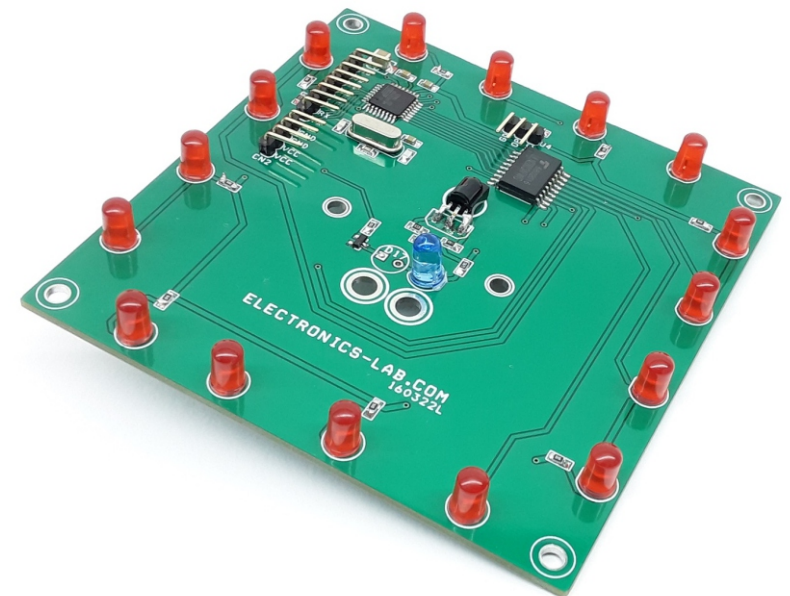
Note 1: It is important to use an original IR LED and IR sensor from Vishay, as cheap sensors have lots of noise and cause abnormal behavior. Especially black sleeve/cover is required around the LED so IR emissions do not leak and hit the IR sensor directly.



Note 2: Optional U4 connector provided for Analog sensor input, in case of external sensor interface is required.

Features

- Supply 5V DC @ 200mA
- 8 x LED Groups to Create Multiple LED effects
- On-Board IR LED
- Sensing Distance 2 cm to 15 cm
- On-Board IR Sensor
- PCB Dimensions 95.98 x 95.25mm
- 4 x 3mm Mounting Holes



Arduino Pins and other Connections

- Arduino Analog Pin A0 Optional analog Sensor Interface Connector U4
- CN1: Arduino Programming and Boot-Loader, Pin1 TX, Pin 2 RX, Pin 3 Reset, Pin 4 GND, Pin 5 VCC, Pin 6 D11, Pin 7 D12, Pin 8 D13
- Arduino Digital Pin D4 = LED 8 and LED 16
- Arduino Digital Pin D5 = LED 7 and LED 15
- Arduino Digital Pin D6 = LED 6 and LED 14
- Arduino Digital Pin D7 = LED 5 and LED 13
- Arduino Digital Pin D8 = LED 4 and LED 12
- Arduino Digital Pin D9 = LED 3 and LED 11
- Arduino Digital Pin D10 = LED 2 and LED 10
- Arduino Digital Pin D11 = LED 1 and LED 9
- Arduino Digital Pin D2 IR Sensor
- Arduino Digital Pin D3 IR LED
- CN2: Pin 1 VCC 5V DC, Pin 2 VCC 5V DC, Pin 3 GND, Pin 4 GND

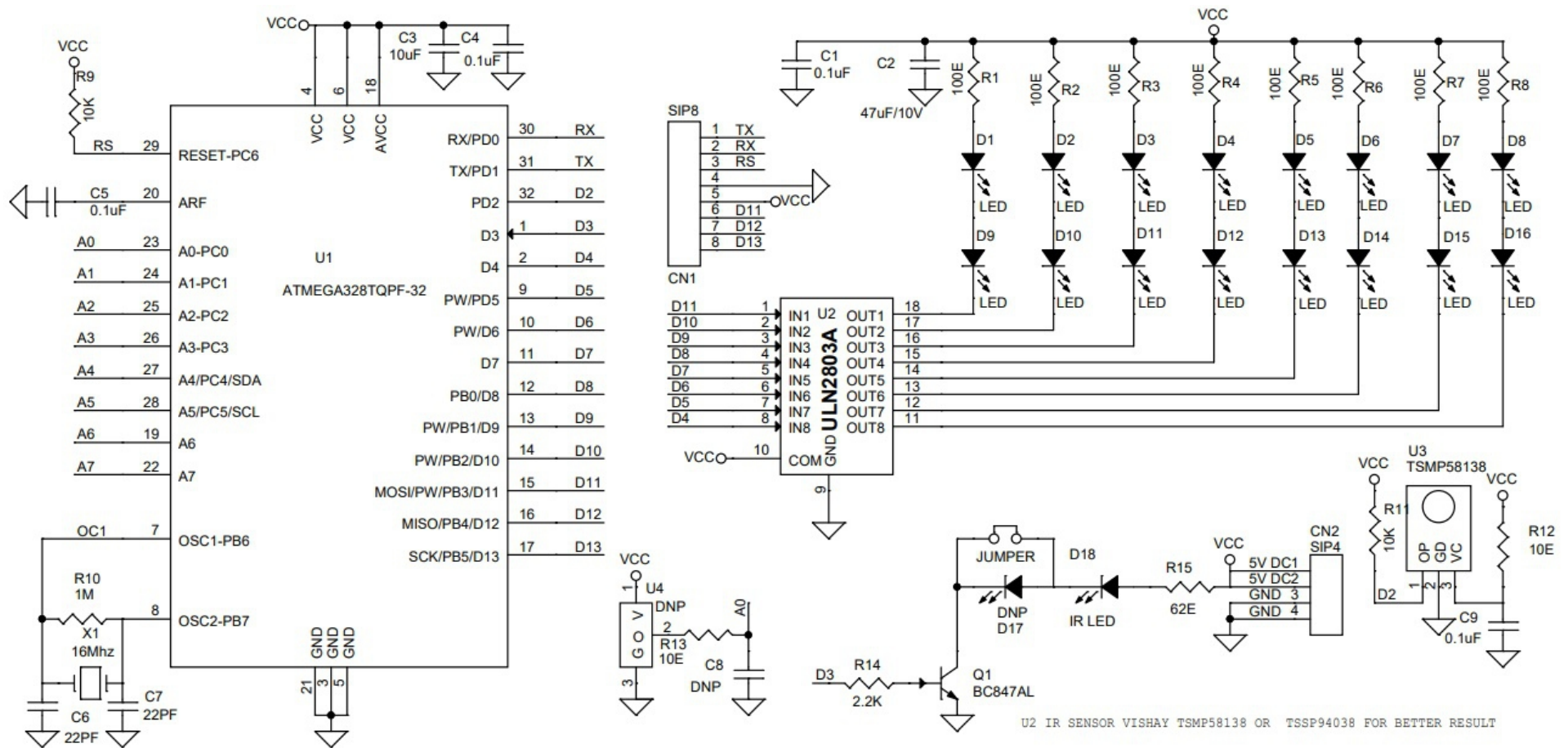
Arduino Programming

Sample Arduino code is available as a download. The ATmega328 chip generates 38Khz pulses which drive the IR LED using a BC847 transistor, IR sensor is installed close to IR LED, When an object approaches the IR light, it reflects and falls on the IR sensor. IR sensor sends the signal to the ATMEGA328 chip and it drives all the outputs high, thus all LEDs are ON and continue in the same state until the object is removed. Refer to the connection diagram for bootloader burning and programming the ATMEGA chip with help of Arduino IDE. Users may write their own code as per requirements.



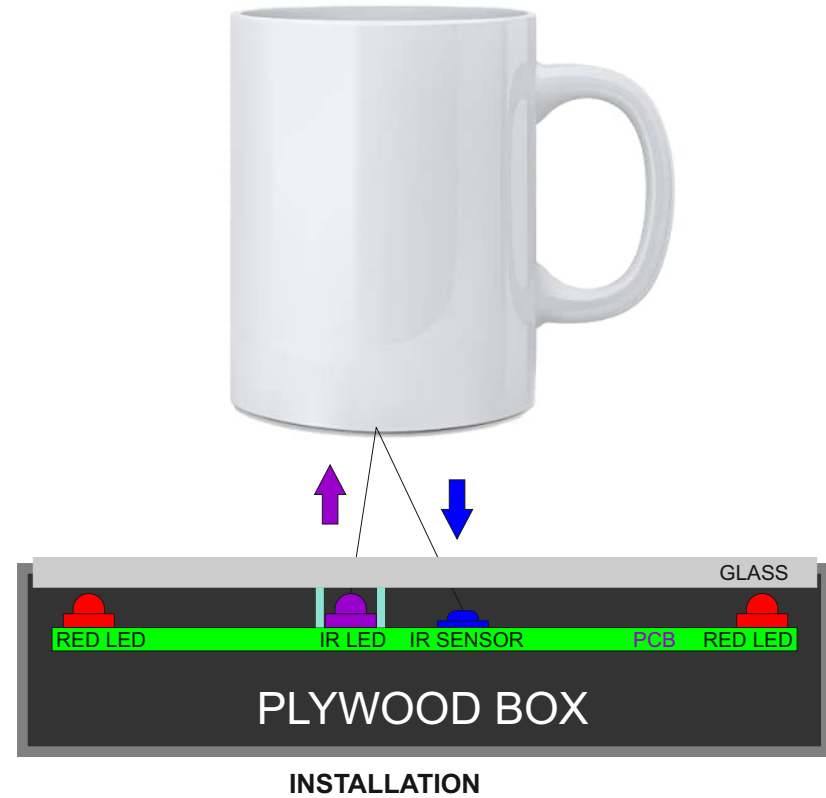
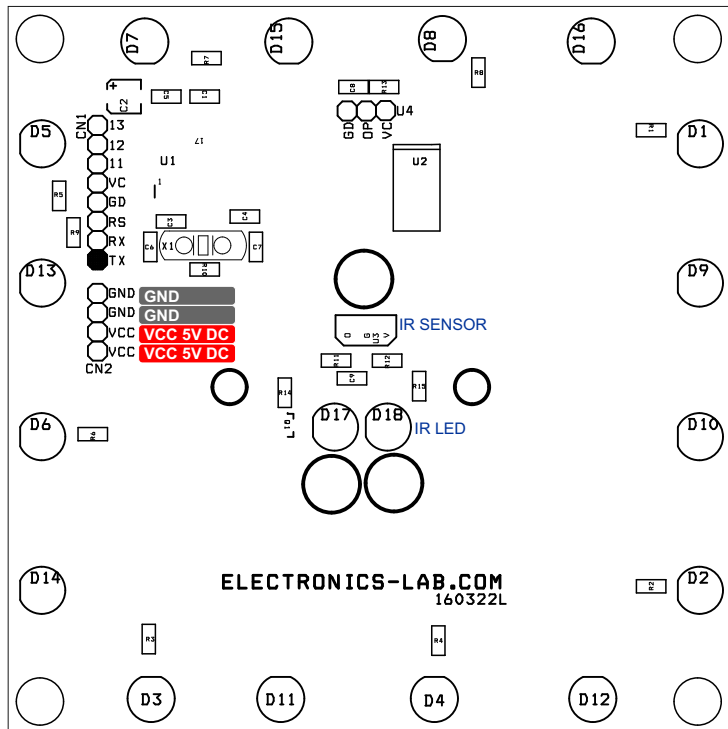
Note 3: The user may replace the LED with green, blue, yellow, orange, or white. In this case, consider the voltage and current of LEDs, and choose the appropriate LED series resistor as per the LED datasheet.

Schematic

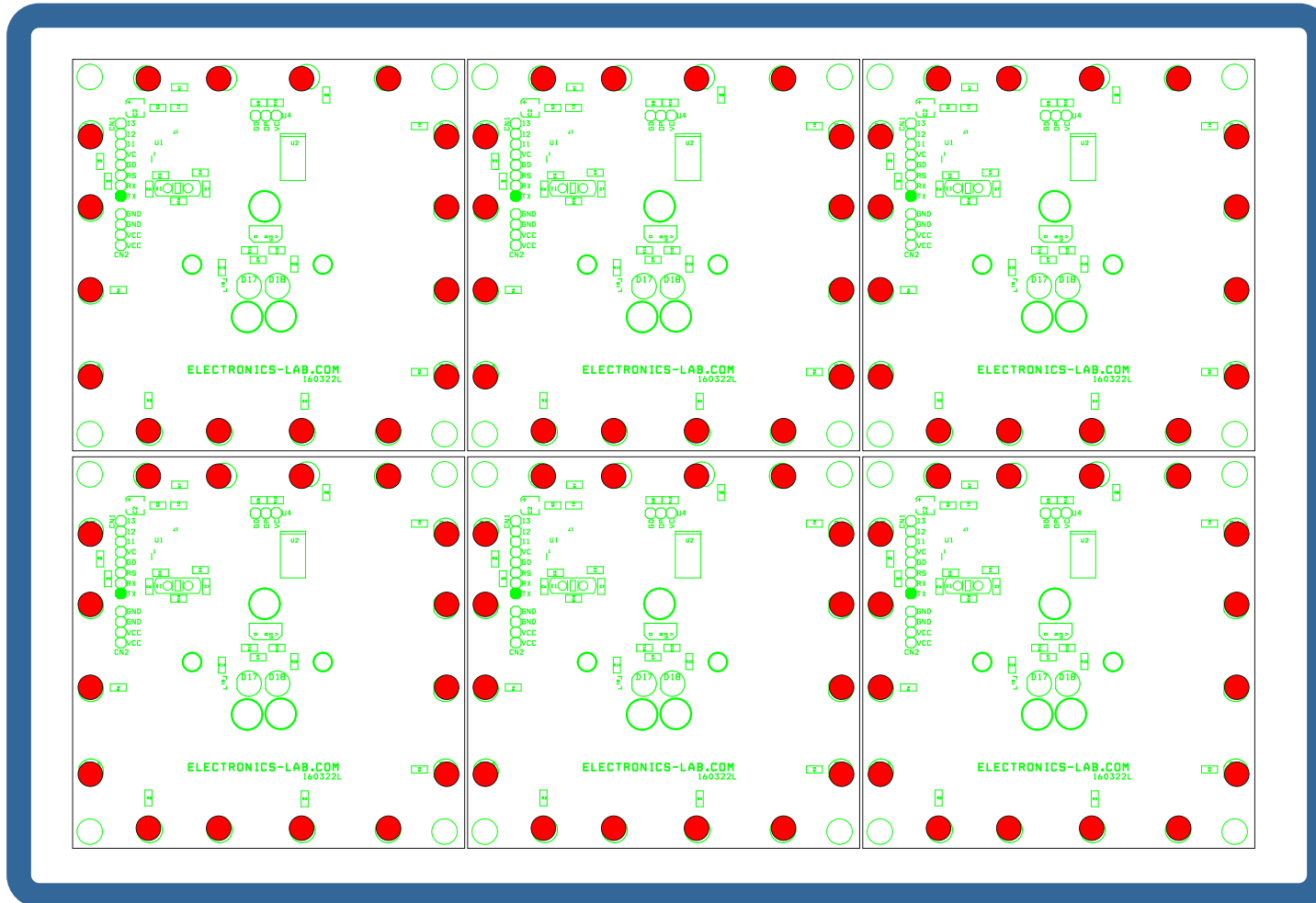


Note 4: The project may be used for other LED light applications as well, that's why all 8 LED groups kept independent to create multiple light effects and colors.

Connections

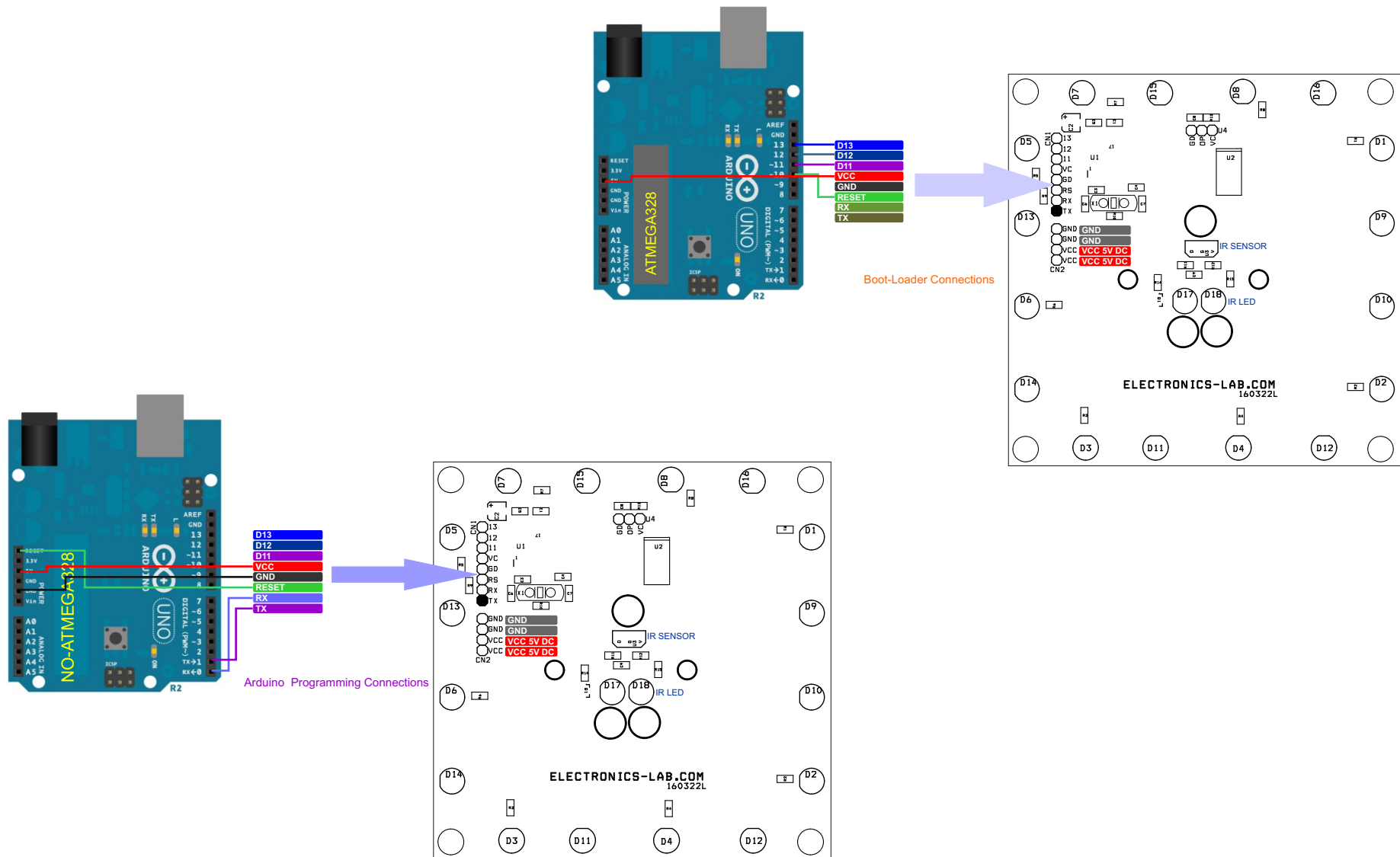


Connections

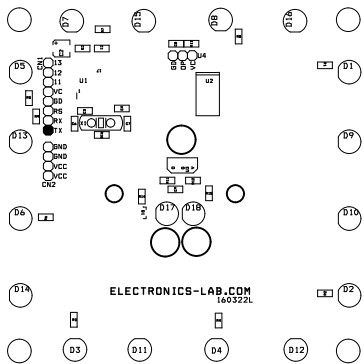
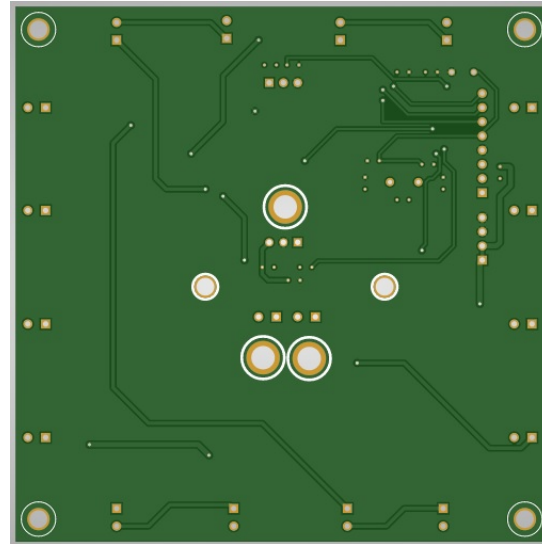
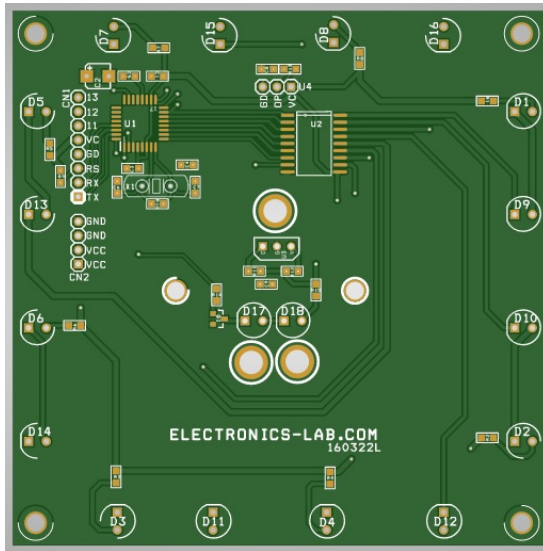


MULTIPLE PCB MOUNTING ON THE TABLE

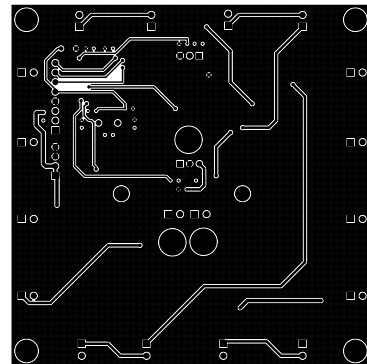
Arduino Connections



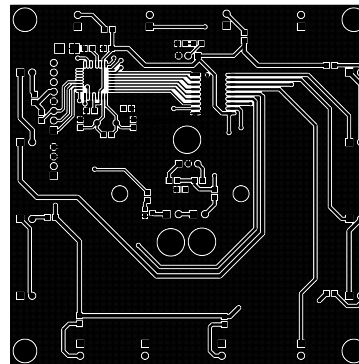
PCB



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 95.98MM X 95.25MM

Parts List

BOM						
NO.	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	1	CN1	8 PIN MALE HEADER RIGHT ANGLE PITCH 2.54MM	WURTH		732-5321-ND
2	1	CN2	4 PIN MALE HEADER RIGHT ANGLE PITCH 2.54MM	WURTH		732-5317-ND
3	4	C1,C4,C5,C9	0.1uF/10V CERAMIC SMD SIZE 0805	YAGEO/MURATA		
4	1	C2	47uF/10V CERAMIC SMD SIZE 1210	YAGEO/MURATA		
5	1	C3	10uF/10V CERAMIC SMD SIZE 0805	YAGEO/MURATA		
6	2	C6,C7	22PF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA		
7	3	U4,C8,D17	DNP			
8	16	D1 TO D16	5MM RED LED OR GREEN	SUNLED		1497-XCMDK12D-ND
9	1	D18	IR LED 5MM	KINGBRIGHT		754-2222-ND
10	1	J1	WIRE JUMPER JUMPER			WIRE JUMPER
11	1	Q1	BC847AL	NEXPERIA		1727-2924-2-ND
12	8	R1,R2,R3,R4,R5,R6,R7,R8	100E 5% SMD SIZE 0805	YAGEO/MURATA		
13	2	R9,R11	10K 5% SMD SIZE 0805	YAGEO/MURATA		
14	1	R10	1M 5% SMD SIZE 0805	YAGEO/MURATA		
15	2	R12,R13	10E 5% SMD SIZE 0805	YAGEO/MURATA		
16	1	R14	2.2K 5% SMD SIZE 0805	YAGEO/MURATA		
17	1	R15	62E 5% SMD SIZE 0805	YAGEO/MURATA		
18	1	U1	ATMEGA328TQPF-32	MICROCHIP		ATMEGA328PB-AURCT-ND
19	1	U2	ULN2803A	TI		ULN2803ADW-ND
20	1	U3	TSMP58138	VISHAY		TSMP58138
21	1	X1	16Mhz	ECS INC		X1103-ND

Keep
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