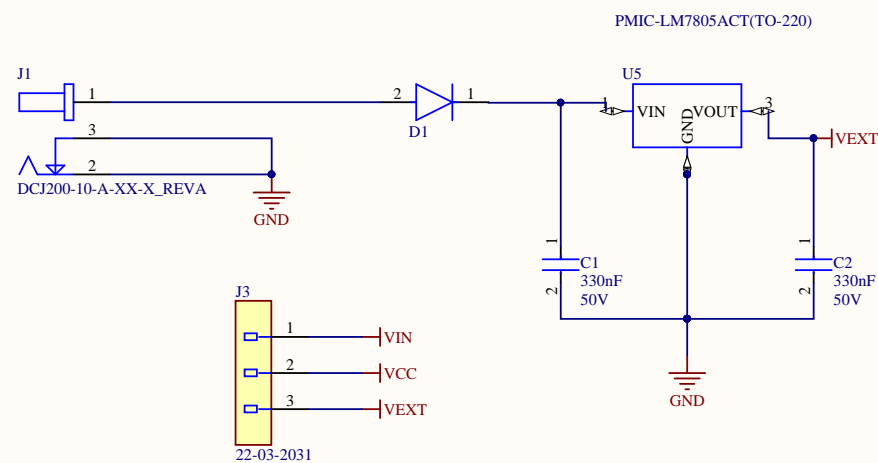


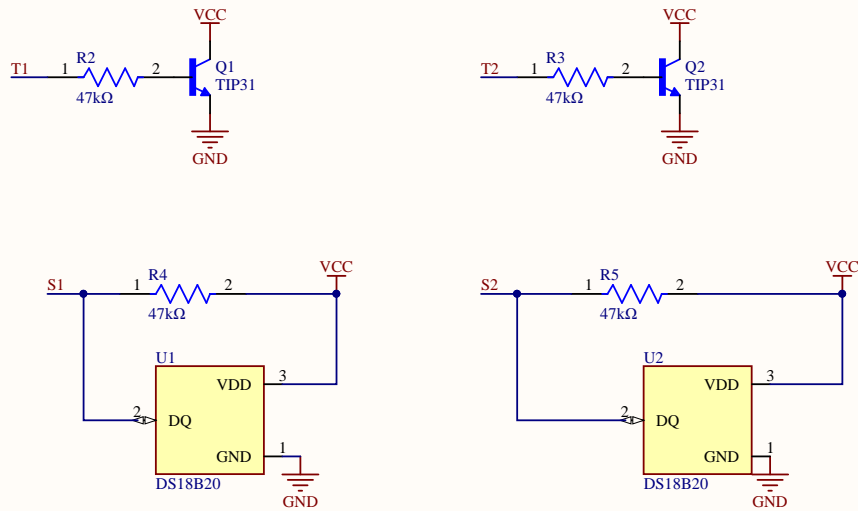
# Power supply



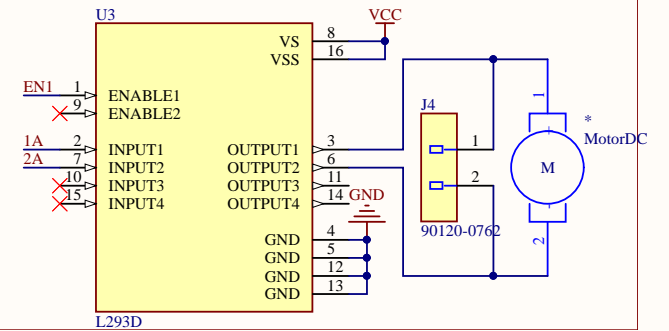
Title			Alimentación	
Size	Number		Revision	
A4	<a href="https://tsc-lab.blogspot.com/">https://tsc-lab.blogspot.com/</a>			
Date:	7/15/2021		Sheet	of
File:	D:\GoogleDrive\...\Alimentacion.SchDoc		Drawn By:	TSC-Lab

# Control

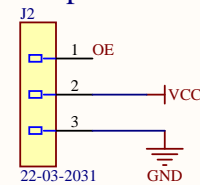
## Temperature



## Motor

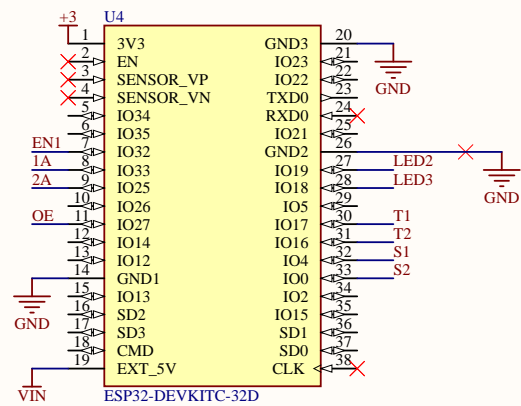


## Optical encoder



Title			Control	
Size	Number	<a href="https://tsc-lab.blogspot.com/">https://tsc-lab.blogspot.com/</a>		Revision
A4				
Date:	7/15/2021	Sheet		of
File:	D:\GoogleDrive\...\Control.SchDoc	Drawn By:		TSC-Lab

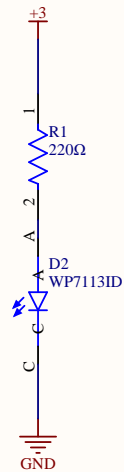
# Microcontroller



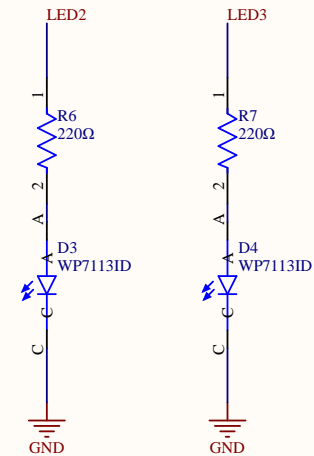
Title			Microcontrolador
Size	Number	Revision	
A4	<a href="https://tsc-lab.blogspot.com/">https://tsc-lab.blogspot.com/</a>		
Date:	7/15/2021	Sheet	of
File:	D:\GoogleDrive\...\Microcontrolador.SchDoc	Drawn By:	TSC-Lab

# Peripheral

## Test de Voltaje



## Test de ESP

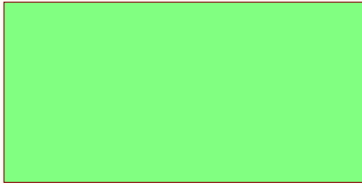


Title			Periférico
Size	Number	Revision	
A4	<a href="https://tsc-lab.blogspot.com/">https://tsc-lab.blogspot.com/</a>		
Date:	7/15/2021	Sheet	of
File:	D:\GoogleDrive\...\Periferico.SchDoc	Drawn By:	TSC-Lab

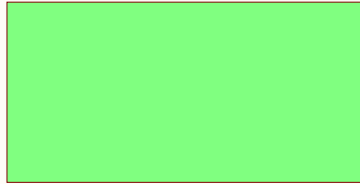
# TSC-Lab

1. Power supply
2. Microcontroller
3. Control
4. Peripheral

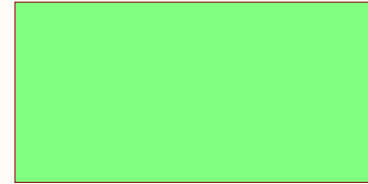
Designator  
Alimentacion.SchDoc



Designator  
Microcontrolador.SchDoc



Designator  
Control.SchDoc



Designator  
Periferico.SchDoc

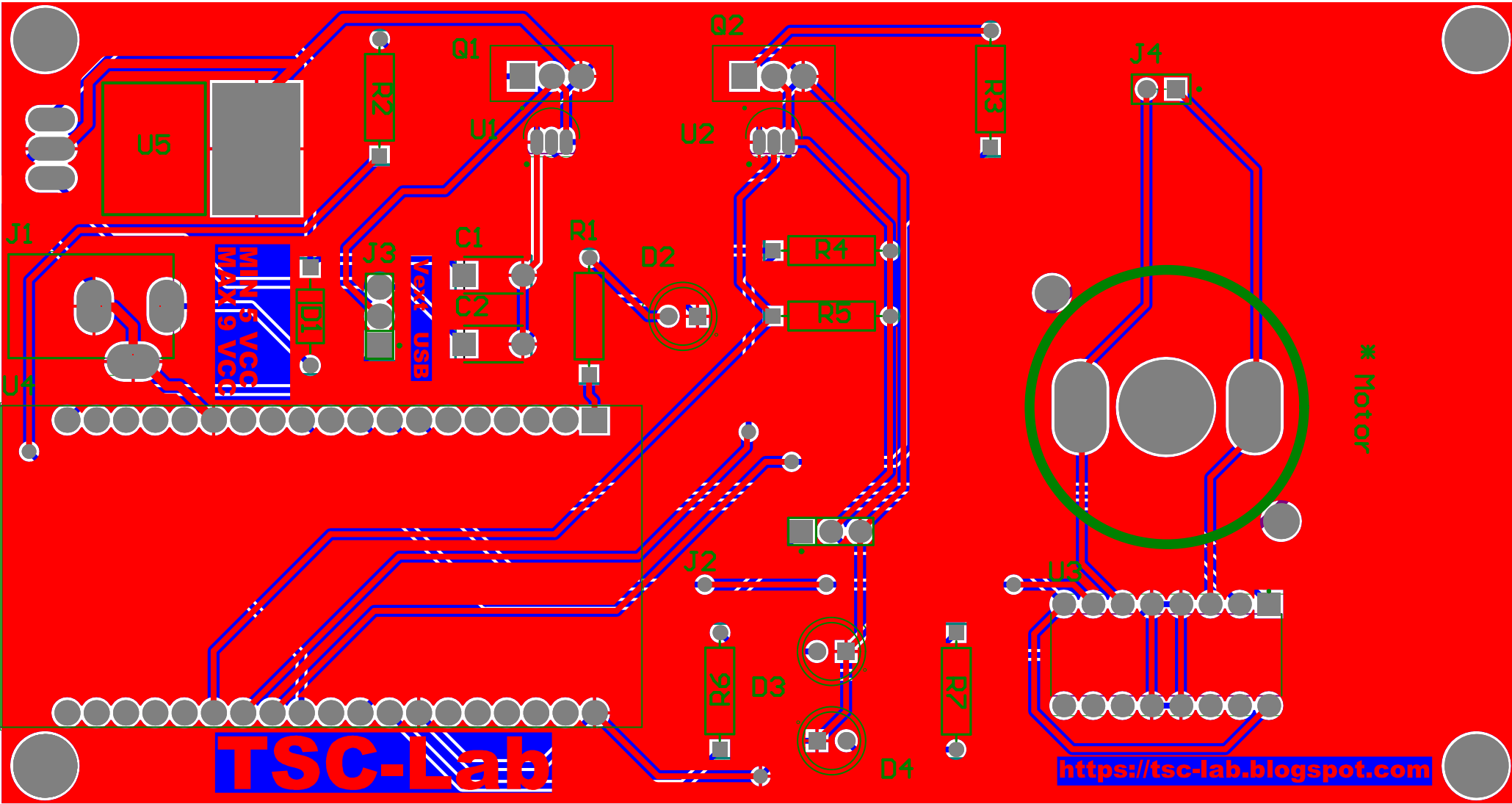


▲ The Temperature and Speed Control Lab (TSC-Lab) is an application of feedback control with an ESP32, an LED, two heaters, two temperature sensors, one direct current motor and an optical encoder as a revolution per minute (rpm) meter. The heater power output is adjusted to maintain the desired temperature setpoint. Thermal energy from the heater is transferred by conduction, convection, and radiation to the temperature sensor. Heat is also transferred away from the device to the surroundings. On the other hand, the motor speed is adjusted using a motor driver and with PWM signals, allowing the reference speed to be reached using the rpm meter.

The practice guides that were used in the data acquisition process are detailed in the following blog:  
<https://tsc-lab.blogspot.com/p/summary.html>

The codes used are in the following repository:  
<https://github.com/vasanza/TSC-Lab>

Title			TSC-Lab	
Size	Number		Revision	
A4	<a href="https://tsc-lab.blogspot.com/">https://tsc-lab.blogspot.com/</a>			
Date:	7/15/2021		Sheet	of
File:	D:\GoogleDrive\...\TSC-Lab.SchDoc		Drawn By:	TSC-Lab



TSC-Lab

<https://tsc-lab.blogspot.com>

Comment	Description	Designator	Footprint	LibRef	Quantity
MotorDC			PCBComponent_1	MotorDC	
Cap_Kemet_C322C33	CAP CER 0.33UF 50V	C1, C2	Kemet_C322C334M5U	Cap_Kemet_C322C33	
Diode_Vishay_1N4001	DIODE GEN PURP 50V	D1	Vishay_1N4001E-E3-5	Diode_Vishay_1N4001	
WP7113ID	LED; Thru-Hole; Gree	D2, D3, D4	LED_WP7113ID	WP7113ID	
DCJ200-10-A-XX-X_R	DC Power Jack, Thru-	J1	GCT_DCJ200-10-A-XX	DCJ200-10-A-XX-X_R	
Conn_Molex_22-03-20	CONN HEADER 3POS	J2, J3	Molex_SD-4030-0001	Conn_Molex_22-03-20	
Conn_Molex_90120-0	CONN HEADER 2POS	J4	Molex_90120-0762_0	Conn_Molex_90120-0	
TIP31	Bipolar (BJT) Transist	Q1, Q2	TO254P1060X482X22	TIP31	
Res_Vishay_SFR2500	RES 220 OHM 0.4W 1%	R1, R2, R3, R4, R5, R	Vishay_SFR250000220	Res_Vishay_SFR2500	
DS18B20	digital thermometer -5	U1, U2	TO-92-TO92127P495H	DS18B20	
L293D	4-Channel Motor Drive	U3	DIP880W50P254L2000	L293D	
ESP32-DEVKITC-32D	Eval Board For Esp-W	U4	MODULE_ESP32-DEV	ESP32-DEVKITC-32D	
PMIC-LM7805ACT(TO	310030049	U5	TO-220	PMIC-LM7805ACT(TO	