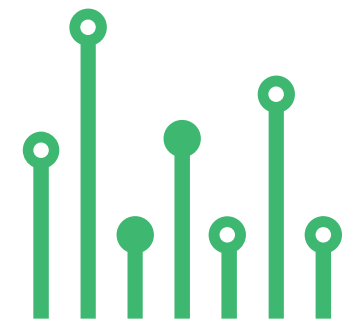


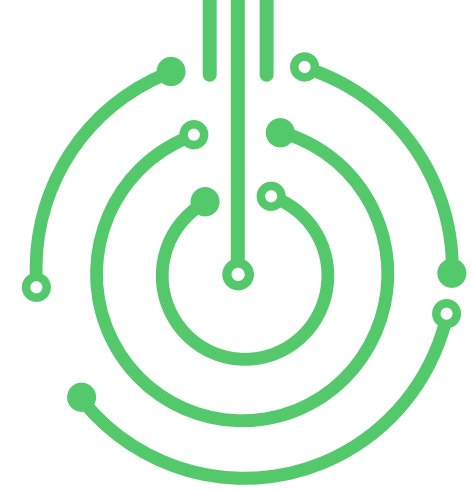
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# Bluetooth Robot Car Controller Using ESP32



SKU: EL144152

# Bluetooth Robot Car Controller



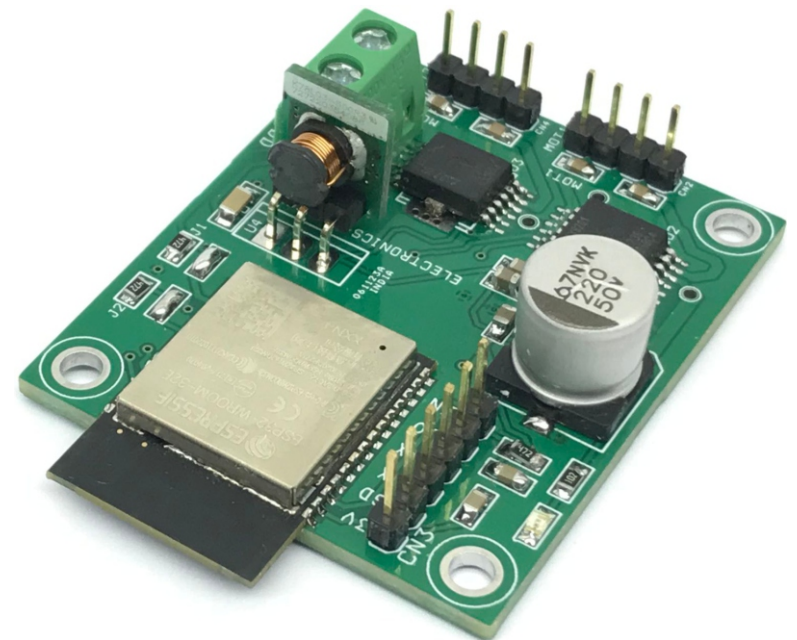
This wireless robot car controller board is built using an ESP32 BT/Wi-Fi module, 2 x H-Bridges, 3.3V regulator. It also includes an ESP32 programming connector, power LED, screw terminal connector for the power supply, header connector for motors, and high-value capacitors on the DC supply for smooth motor operations. The operating power supply is 8V to 24V DC. The project has two H-bridges and each can drive 2.5A continuously. The board is suitable for small and medium-sized robot cars. It is an open-source hardware project that can be programmed as per requirement. ESP32 I/O details are available in descriptions. ESP32 supports Bluetooth connectivity and the robot car can be controlled using a small phone, Laptop, or Tablet. The project was built using an ESP32-Wroom processor and this chip supports Bluetooth and Wi-Fi connectivity.

The project can be tested with example Arduino code which is provided below. The user will be able to drive a robot car with a PS3 Bluetooth remote. Refer to the link below to learn more about PS3 and ESP32 pairing, and ESP32 programming under Arduino IDE.

<https://dronebotworkshop.com/ps3-esp32/>

## FEATURES

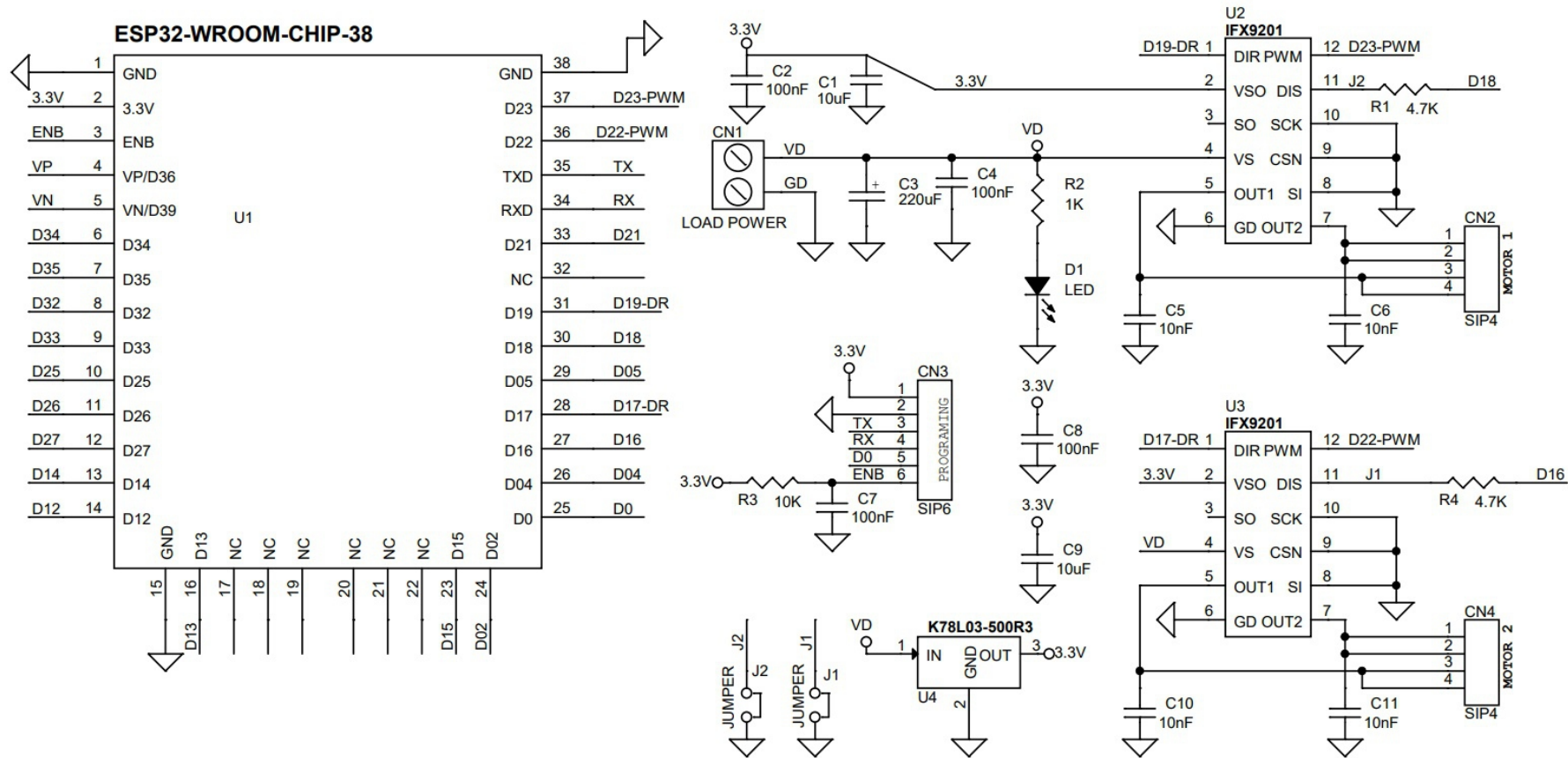
- Power Supply 8V to 24V DC
- Motor Load up to 2.5A, Peak 6Amps Each Motor
- Over Current Shutdown Threshold 8Amps
- No Heatsink for H-Bridge
- PWM Frequency Up to 20Khz (Tested), ESP32 Default Output 500Hz
- Board Power LED
- Overtemperature Shut down with Latch Behaviour, H-Bridge
- Short Circuit Shut Down with Latch Behaviour, H-Bridge
- Chopper Current Limitation, H-Bridge
- VDD Undervoltage Shutdown
- 4 X 3MM Mounting Holes
- PCB Dimensions 48.90 X 41.28MM



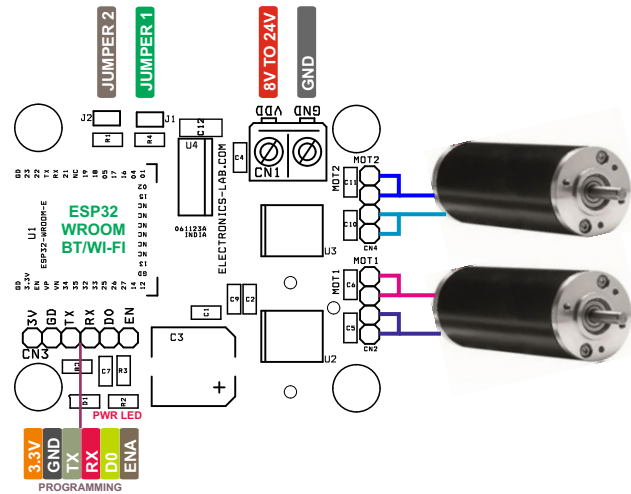
## ESP32 PINS VS H-BRIDGE U2 AND U3 PINS

- GPIO23/D23-PWM = U2 PWM, Motor 1
- GPIO22/D22-PWM = U3 PWM, Motor 2
- GPIO19/D19-DR = U2 Direction Control High or Low, Motor 1
- GPIO17/D17-DR = U3 Direction Control High or Low, Motor 2
- GPIO16/D16 = Motor2 Enable/Disable (Solder Jumper J1 = Enable), DE-solder Jumper J1 for ESP32 Enable/Disable Control
- GPIO18/D18 = Motor1 Enable/Disable (Solder Jumper J2 = Enable), DE-solder Jumper J1 for ESP32 Enable/Disable Control

# Schematic



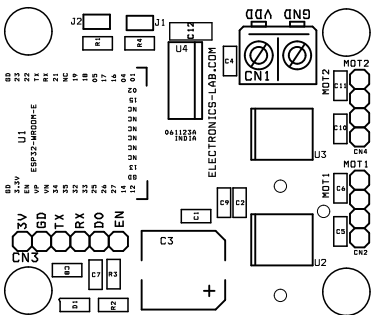
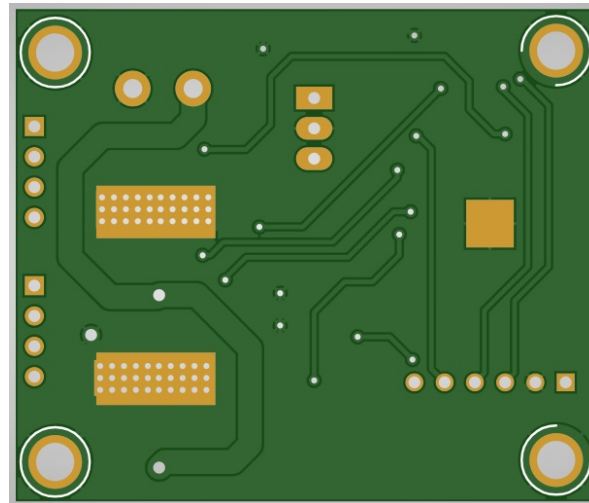
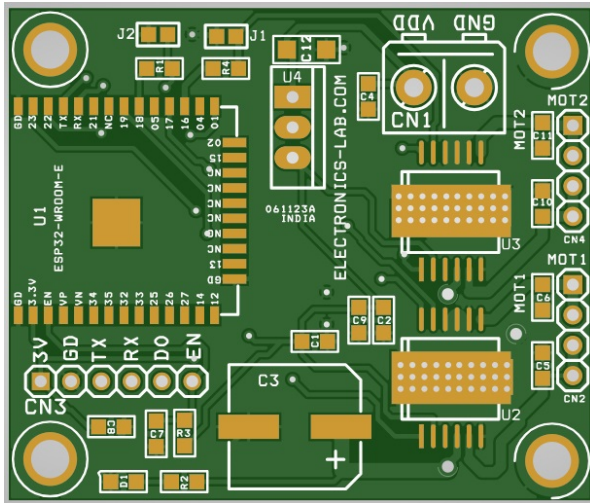
# Connections



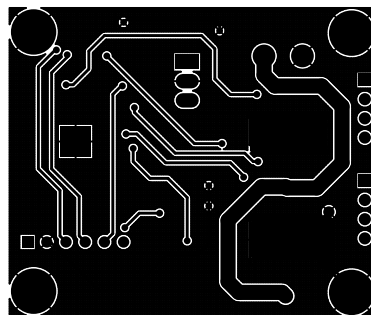
## Connections:

- CN1: Pin 1 VDD 8V to 24V, Pin 2 = GND
- CN2: Pin 1 & 2 = Motor 1, Pin 3 & 4 = Motor 1
- CN3: Pin 1 = 3.3V, Pin 2 = GND, Pin 3 = TX, Pin 4 = RX, Pin 5 = GPIO0, Pin 6 = Enable (Programming Connector)
- CN4: Pin 1 & 2 = Motor 2, Pin 3 & 4 = Motor 2
- J1: Jumper Closed (Pull Low) = Enable, can be controlled using ESP32 Pin GPIO16 Pin High = Disables Motor 1
- J2: Jumper Closed (Pull Low) = Enable, can be controlled using ESP32 Pin GPIO18 Pin High = Disables Motor 2
- D1: Power LED
- U4: 3.3V Regulator, Provides 3.3V to ESP32 processor input from Motor Supply 8V to 24V
- U3: H-Bridge Motor Driver, Motor 2

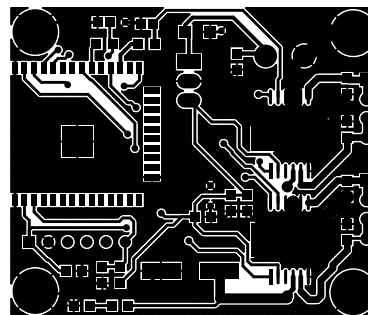
# PCB



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 48.90 X 41.28MM

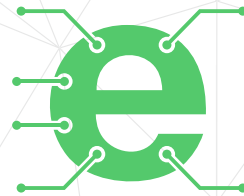
# Parts List

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BOM						
NO.	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	1	CN1	2 PIN SCREW TERMINAL PITCH 5.08MM	PHOENIX	DIGIKEY	277-1247-ND
2	2	CN2,CN4	4 PIN MALE HEADER PITCH 2,54MM	WURTH	DIGIKEY	732-5317-ND
3	1	CN3	6 PIN MALE HEADER PITCH 2.65MM	WURTH	DIGIKEY	732-5319-ND
4	2	C1,C9	10uF/10V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
5	4	C2,C4,C7,C8	100nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
6	1	C3	220uF/50V ELECTROLYTIC	NICHICON	DIGIKEY	493-2228-1-ND
7	4	C5,C6,C10,C11	10nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
8	1	D1	LED RED SMD SIZE 0805	OSRAM	DIGIKEY	475-1278-1-ND
9	2	J1,J2	JUMPER- PCB SOLDER			
10	2	R1,R4	4.7K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
11	1	R2	1K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
12	1	R3	10K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
13	1	U1	ESP32-WROOM	ESP	DIGIKEY	1965-ESP32-WROOM-32E-N4TR-ND
14	2	U2,U3	IFX9201	INFINEON	DIGIKEY	IFX9201SGAUMA1CT-ND
15	1	U4	MP-K78L03-500R3	MORNSUM	DIGIKEY	2725-K78L03-500R3-ND







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