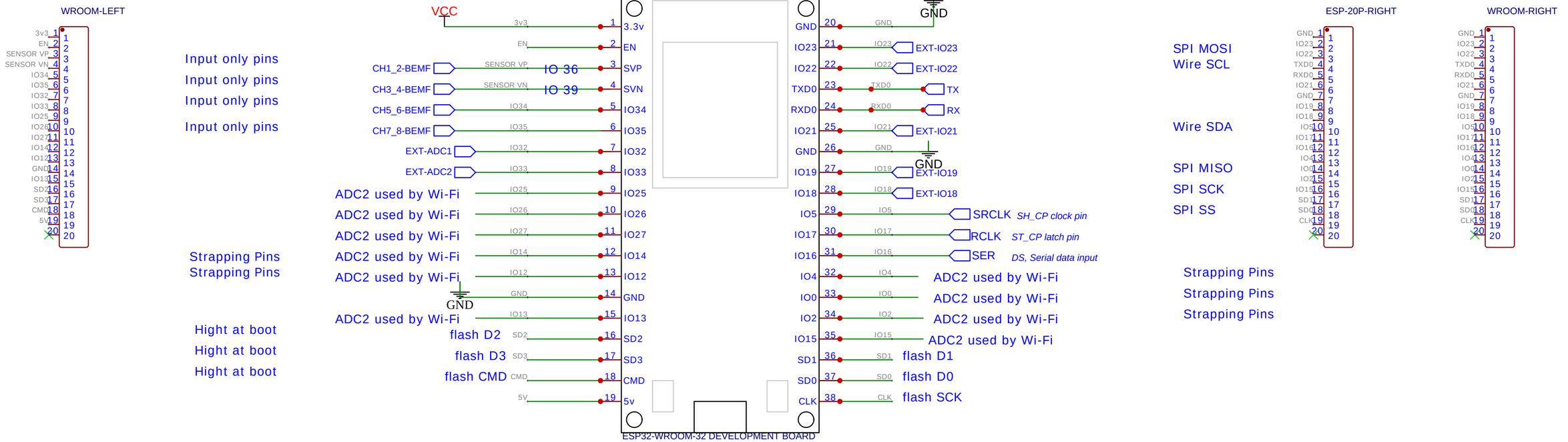
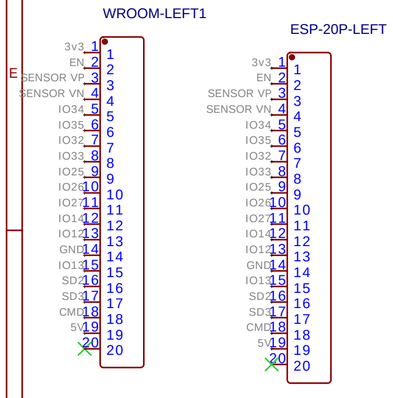
WIFI optimization :5mm space each side of pcb antenna is recommended or use esp32-wroom 32U with external antenna



WROOM-LEFT v2 for larger board



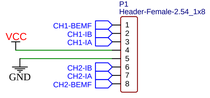
TITLE: Esp devkit		REV: 1.2
EasyEDA	Company: Barbarossa	Sheet: 1/1
	Date: 2021-01-25 Drawn By: nliaudat	

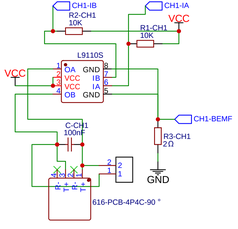
L9110 driver chips supports DC voltages from 2.5 to 12 V, caters continuous current of 800 mA, and has a maximum peak current of 1.5 to 2 A

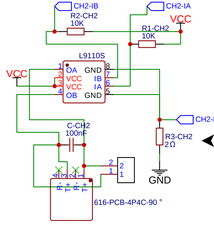
L9110 as single VCC for both control logic and motor driver circuits
we can run the module from a 3-V DC supply for 3-V DC motors and from 5 V for 5-V DC motors

IA = PWM (or not) for speed control
IB = direction (forward / reverse) control.
BEMF = back electromotive force (used as endstop sensor)
VCC = 3.3V or 5V (must be the same as logic controller)

L9110 as single VCC for both control logic and motor driver circuits
So we can run the module from 3.3V controller (ESP) for 3-V DC motors and from 5 V (Arduino) for 5-V DC motors
Caters continuous current of 800 mA, and has a maximum peak current of 1.5 to 2 A

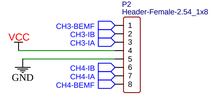


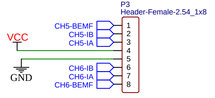


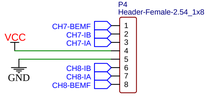


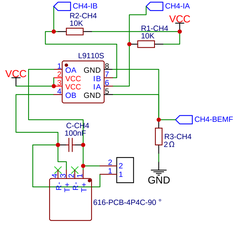
2 ohm resistors (2 per channel)
In parallel it's 1 ohm.
With the gain of the op-amp (6)
this gives blocking voltages at 25mA / 1 Ohm * 6 = 0.150V

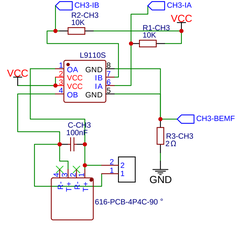
TITLE: L9110 modules	REV: 1.2
EasyEDA Company: Barbarossa	Sheet: 1/1
Date: 2021-01-25 Drawn By: nliaudat	

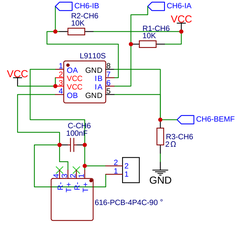


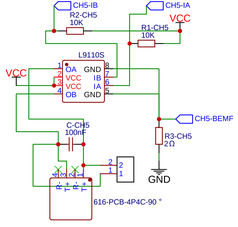


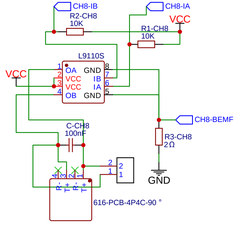


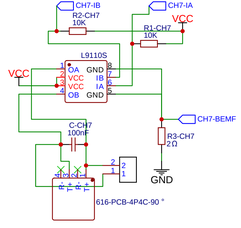


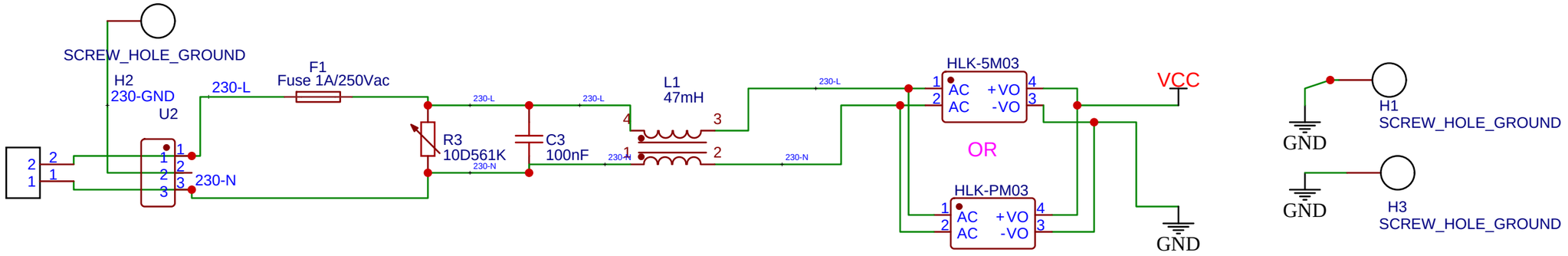




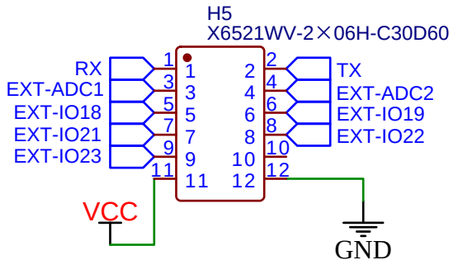








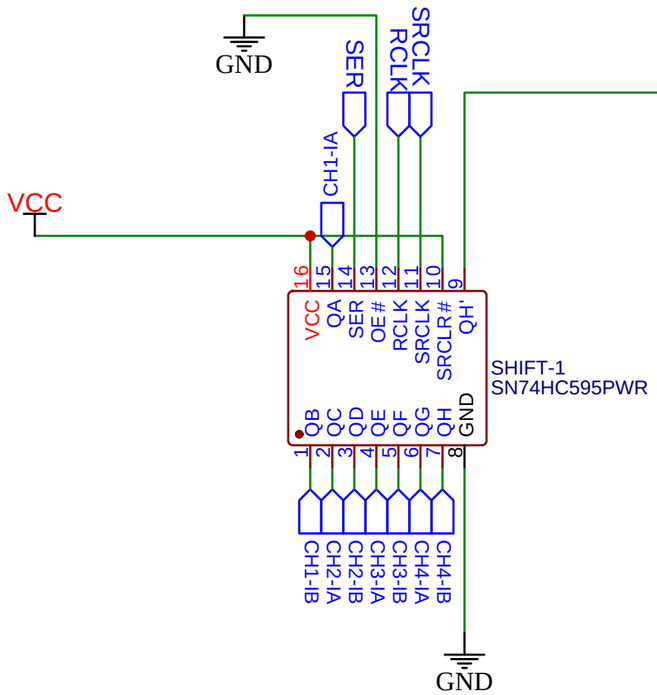
Extension board 2



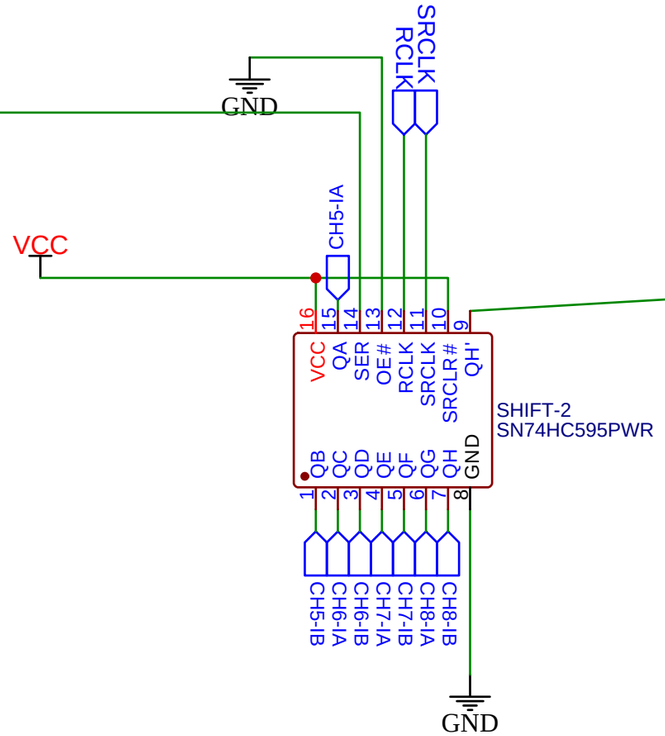
TITLE: Power & coms		REV: 1.2
EasyEDA	Company: Barbarossa	Sheet: 1/1
	Date: 2021-01-25 Drawn By: nliaudat	

Note :
Up to 4 shift register linkable

SN74HC595 #1

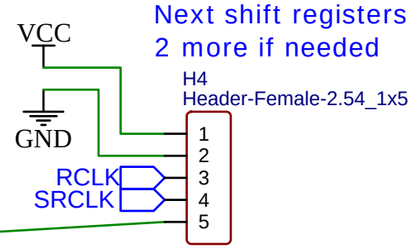


SN74HC595 #2

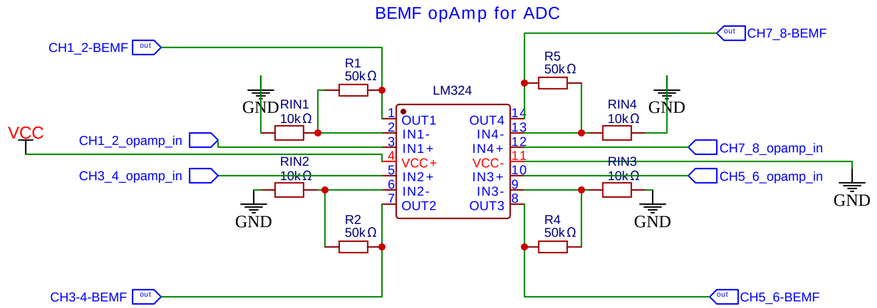


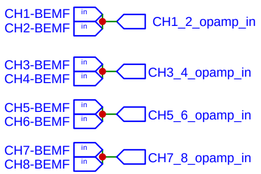
Pinout for extension board

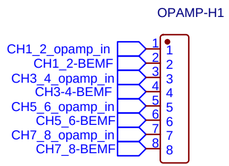
Next shift registers
2 more if needed



TITLE: Shift registers		REV: 1.2
EasyEDA	Company: Barbarossa	Sheet: 1/1
	Date: 2021-01-25 Drawn By: nliaudat	



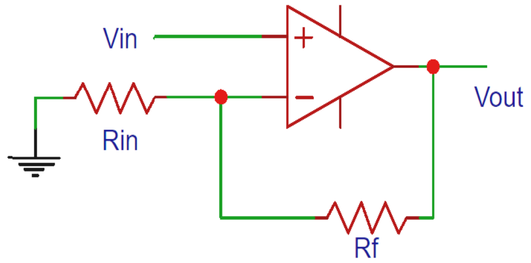




https://datasheet.lcsc.com/lcsc/2003051031_HGSEMI-LM324M-TR_C194286.pdf

TITLE: OpAmp		REV: 1.0
嘉立创EDA	Company: Your Company	Sheet: 1/1
	Date: 2022-11-25 Drawn By: nliaudat	

non-Inverting Op-amp



Gain = Vout/Vin = 1 + Rf/Rin

Gain = 1 + Rf/Rin

6 = 1 + 50K/10K

IN => OUT
0.01v =>60mv
0.10v =>600mv
0.50v =>3v

http://mustcalculate.com/electronics/noninvertingopamp.php?vin=0.01&r1=10000&r2=50000