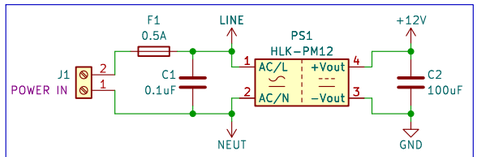
AC POWER INPUT

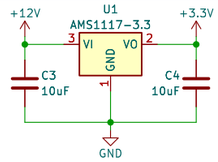


The connector J1 receives the AC input voltage.

PS1 (HLK-PM12) is an encapsulated power supply, which converts the AC input voltage to 12V DC.
The power supply maximum power is 3W.

The fuse F1 protects the circuit against overload.
The capacitors C1 and C2 are filtering capacitors.

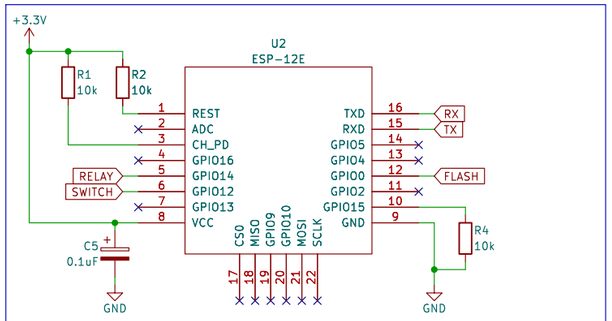
12V TO 3.3V REGULATION



The voltage regulator U1 (AMS1117-3.3) steps the 12V voltage down to 3,3V, with maximum output current of 1A.

The capacitors C3 and C4 are filtering capacitors.

WIFI MODULE



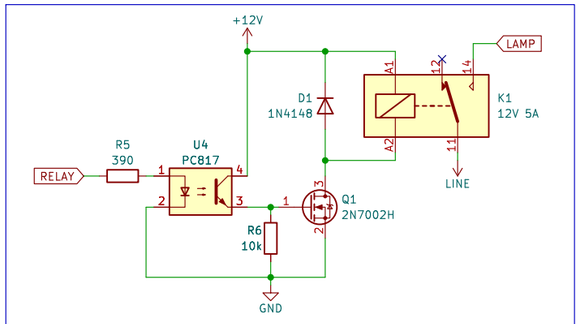
The module U2 (ESP-12E) is the responsable for receiving the commands over WiFi or switch and controlling the relay accordingly.

Some of its pins must be pulled up or down. This is done through the resistors R1, R2, R3 and R4.

The capacitor C5 is a filtering capacitor for the power input.

The switch SW1 connects the GPIO0 pin to ground, wich is necessary when uploading the code.

RELAY CONTROL



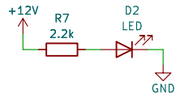
A digital output is used to control the relay through the Q1 transistor (2N7002H).

The U4 optocoupler (PC817) isolate the output from the power circuit.

When the output's logic level is LOW, the transistor is not conducting and the relay coil is de-energized.
When the output's logic level is HIGH, the transistor is conducting and the relay coil is energized.

The R5 resistor limit the optocoupler input current. The R6 resistor pull the transistor gate down.
The D1 diode act as a flyback diode.

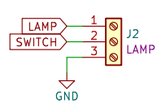
POWER LED



The D2 LED indicates when the 12V bus is powered.

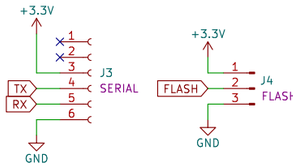
The R7 resistor limits the current through the LED.

LAMP CONNECTOR



The connector J2 is the interface connector for the lamp and the external switch.

PROGRAMMING CONNECTORS



The J3 connector provides access to the WiFi module serial bus.
The J4 connector needs a jumper to connect the microcontroller FLASH pin to 3V3 or GND.
GPIO0 connected to GND is used to program the microcontroller.
GPIO0 connected to 3V3 is uded to run the code.

Alan Carvalho		
Sheet: /		
File: lamp_module_x1.kicad_sch		
Title: Lamp Module X1		
Size: A3	Date: 2024-05-02	**Rev: 1.1**
KiCad E.D.A. kicad 7.0.8		Id: 1/1