**HARDWARE DOCUMENTATION**

**SOURCE FILES AND EXPLAINATION**

Altium files of this project can be found on pcb folder on github

Detailed explanation can be found on my undergraduate thesis report (in Vietnamese only).

This file will only cover things that haven’t been mentioned on the thesis report.

**MOSFET**

This project is using the Power MOSFET IRF540N as the main switch for the 12V LEDs and 12V solenoid locks.

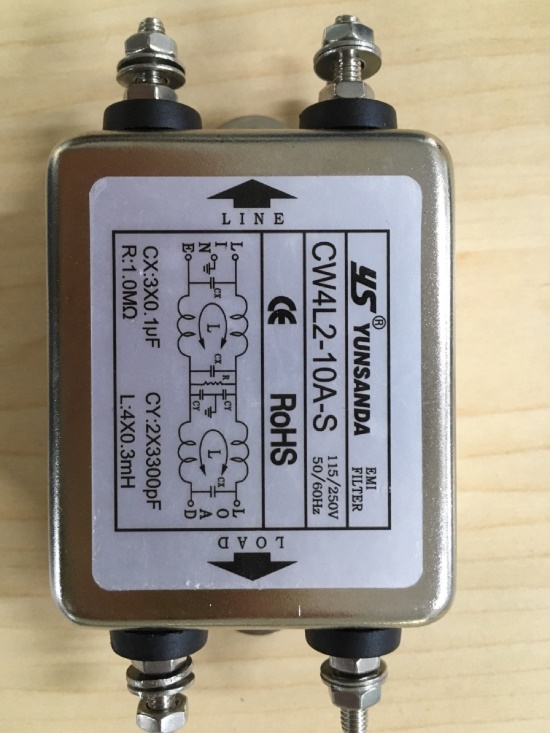
However, this MOSFET is not ideally designed for switching application, it’s designed for linear mode operation.

Currently in the system, it operates in linear mode, but thanks to the high current and high voltage it can endure when applying 5V Vgs, it behaves like a switch.

But obviously this is not optimized design. Therefore, for further version of this system (if any), this type of MOSFET **is not recommended**. Switching type MOSFET is recommended (i.e.: [AO3400 SOT23-3 N-1CH 5A 30V](https://icdayroi.com/ao3400-sot23-3-n-1ch-5a-30v))

**Buttons and limit switches**

Button and limit switches in the system is read by using ADC converter in order to save GPIO pins. However, there are plenty of noises exist because of the low-profile power supply that could severely impact the ADC read. In order to eliminate these noises, a [noise filter](https://shopee.vn/product/11248948/188695028) is used as followed:



This noise filter is connected to the line power to eliminate noises from the line voltage. Therefore, it is EXTREMELY DANGEROUS, please unplug it before doing any experiments or improvements.

For the sake of simple of this current version, all limit switches are behaving the same, but in the future, because we are using ADC, 10 or 20 switches can be