

## Ac power supply

In this report I will explain the power supply details for powering the circuit, the input will be taken from the AC power outlet which is 110V AC,

The first step is to convert the ac voltage to DC voltage using SMPS, the adapter will be selected to give 12V DC, although we need 5volt to supply the circuit but we will use 12v adapter to use a buck converter that will step down the dc 12 volt to 5v dc, the use of another stage for getting 5volts is due to the need for constant 5volts as will as over current protection board.

Figure below shows the power adapter that will give 12v dc to the circuit



Features and specs of the adapter as taken from the reference 1

- AC input ranges from 100V to 240V, 50Hz/60Hz, 0.8A Max; DC output 12V 2A
- 12v 2a AC adapter with 4ft long cable enables you to conveniently make an easy connection

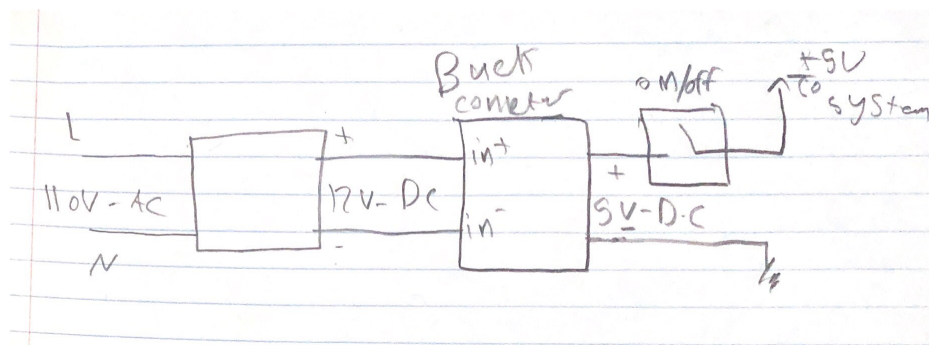
Figure below shows the Buck converter which will step down the voltage from 12V DC to 5V DC and at the same time it does the overcurrent protection as well as the over temperature protection



Features and specs as taken from reference 2

- Synchronous rectification, efficient, stable and reliable.
- Input voltage: 12V (higher than the output voltage of 3V) the maximum 20V (DC 8- 22V)).
- With over-temperature protection
- overcurrent protection
- short circuit protection
- Output voltage: 5V
- Conversion efficiency: > 93%.
- Waterproof level: IP67.Shockproof

Finally figure below shows the connection diagram of the power supply circuit, it will take the 110v from the power socket and convert it to 12v using the power adapter, then the buck converter will stepdown the voltage to 5volts and make the required protections, over heating and short circuit protection and also the over current, on the output of the buck converter we added the switch button to turn on/off the supply voltage



## Reference

1. [https://www.amazon.com/DTECH-Adapter-Supply-1-35mm-Charger/dp/B082XWGGKJ/ref=sr\\_1\\_2\\_sspa?crid=MFZ37N9MYEPA&keywords=smps+12v+2a&qid=1646465403&sprefix=smps+12v+2%2Caps%2C225&sr=8-2-spons&psc=1&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUFGNUZLV1hBMUNPSkcmZW5jcnlwdGVkSWQ9QTA2NzM2MjVCVDFJSk9GN0paM1kmZW5jcnlwdGVkQWRJZD1BMDUyMDQ3NIExT1FNQjVZOUc1VSZ3aWRnZXROYW1lPXNwX2F0ZiZhY3Rpb249Y2xpY2tSZWRpcmVjdCZkb05vdExvZ0NsaWNrPXRydWU=](https://www.amazon.com/DTECH-Adapter-Supply-1-35mm-Charger/dp/B082XWGGKJ/ref=sr_1_2_sspa?crid=MFZ37N9MYEPA&keywords=smps+12v+2a&qid=1646465403&sprefix=smps+12v+2%2Caps%2C225&sr=8-2-spons&psc=1&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUFGNUZLV1hBMUNPSkcmZW5jcnlwdGVkSWQ9QTA2NzM2MjVCVDFJSk9GN0paM1kmZW5jcnlwdGVkQWRJZD1BMDUyMDQ3NIExT1FNQjVZOUc1VSZ3aWRnZXROYW1lPXNwX2F0ZiZhY3Rpb249Y2xpY2tSZWRpcmVjdCZkb05vdExvZ0NsaWNrPXRydWU=)
2. [https://www.amazon.com/KNACRO-Synchronous-Over-Temperature-Over-Current-Protection/dp/B08RMYX25Y/ref=sr\\_1\\_4?crid=1WTHOJL2SN8S9&keywords=buck+converter+overcurrent+protection&qid=1646465948&sprefix=buck+converter+overcurrent+protection%2Caps%2C224&sr=8-4](https://www.amazon.com/KNACRO-Synchronous-Over-Temperature-Over-Current-Protection/dp/B08RMYX25Y/ref=sr_1_4?crid=1WTHOJL2SN8S9&keywords=buck+converter+overcurrent+protection&qid=1646465948&sprefix=buck+converter+overcurrent+protection%2Caps%2C224&sr=8-4)
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