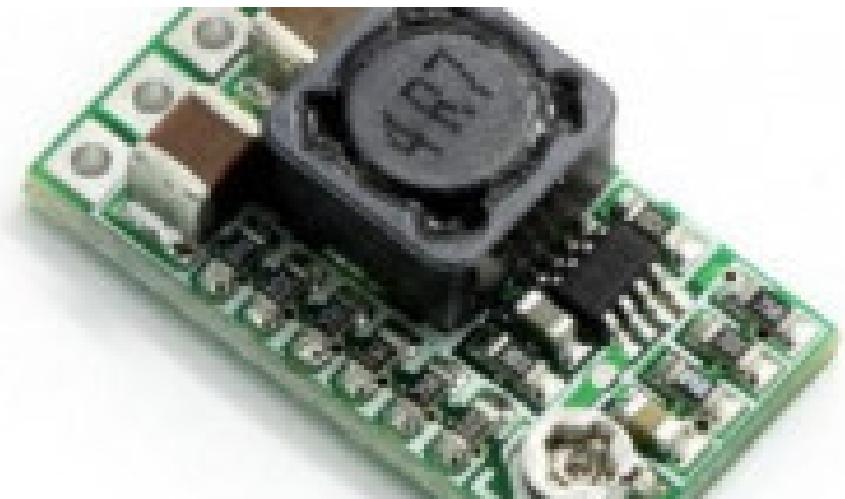
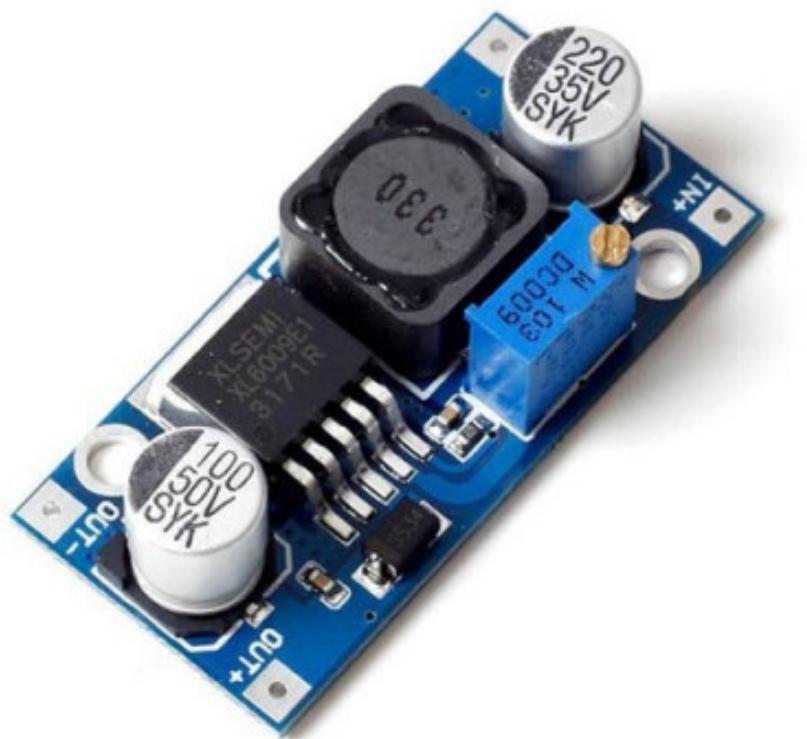
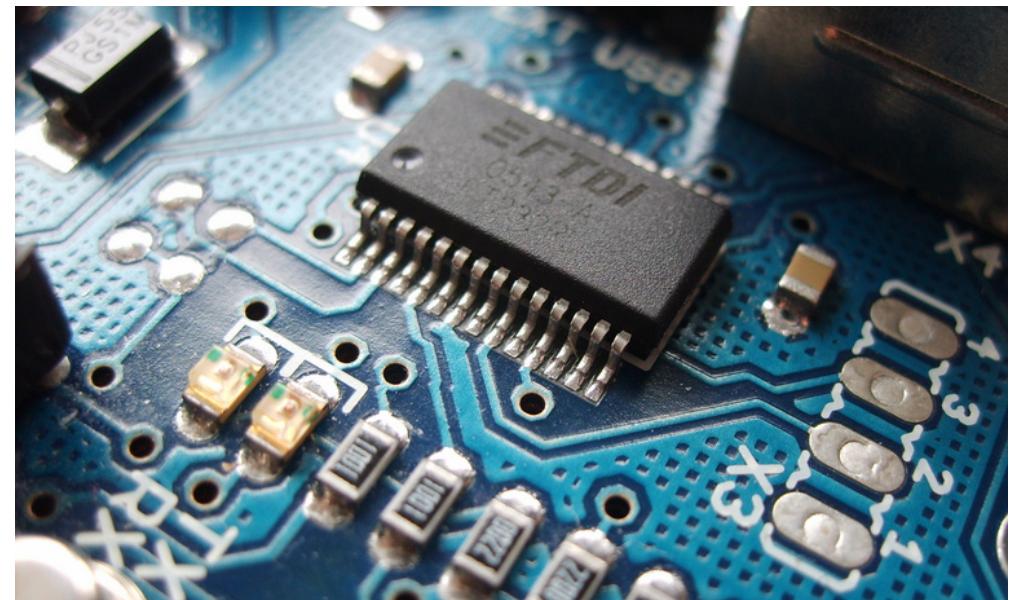




EDC PROJECT PRESENTATION

BUCK CONVERTER & BOOST CONVERTER

Submitted by: RITUL 2K20/EE/221



PROJECT OUTLINE



POINTS FOR DISCUSSION

-INTRODUCTION

- BUCK CONVERTER
- BOOST CONVERTER

-COMPONENTS

-SIMULATION

-WORKING

-CONCLUSION



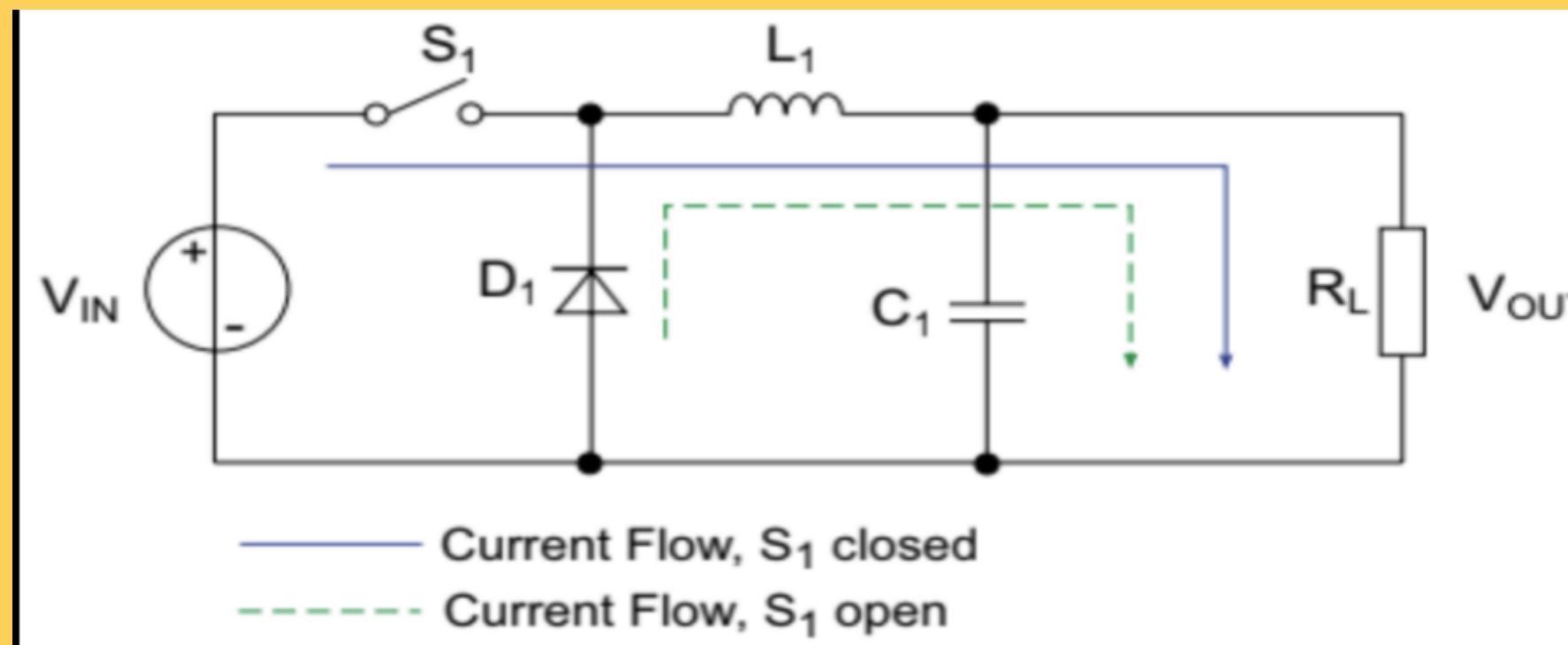
INTRODUCTION

BUCK CONVERTER

A buck or step-down converter is a DC/DC switch mode power supply that is intended to buck/lower the input voltage of an unregulated DC supply to a stabilized lower output voltage.

Buck converters have a number of applications some of which are as follows-

- USB On-The-Go
- POL Converter for PCs and Laptops
- Battery Chargers
- Solar Chargers
- Brushless Motor Controllers



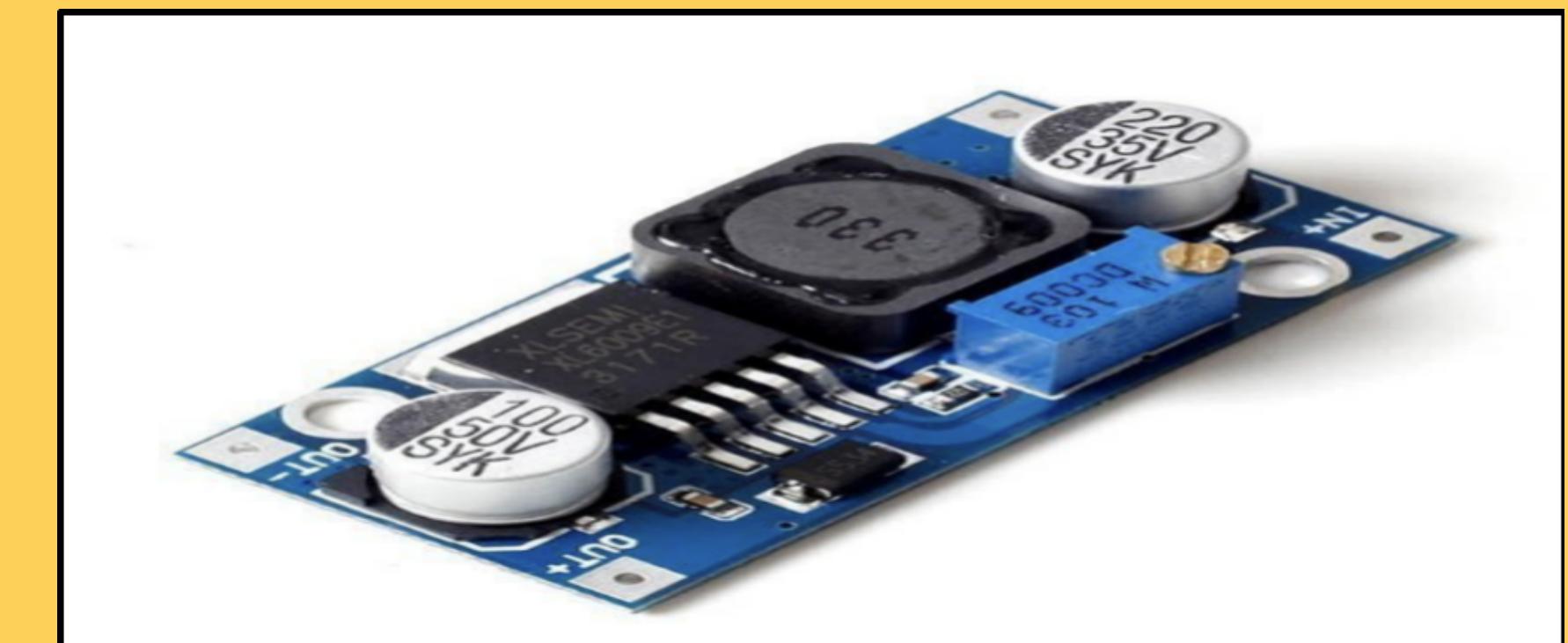
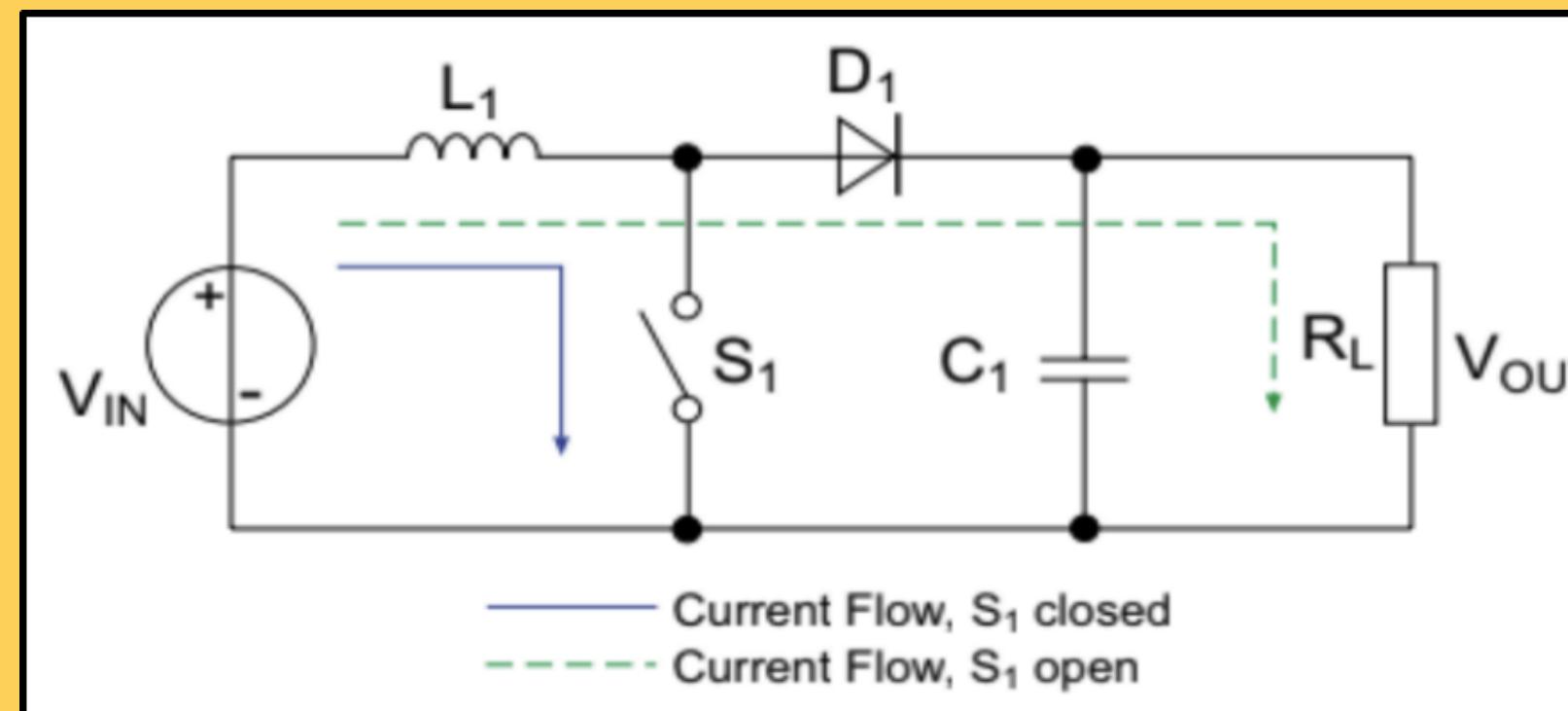
Buck converters are, especially compared to traditional voltage regulators, widely valued for their extremely high efficiencies which can easily exceed 95%

BOOST CONVERTER

A boost converter is a DC/DC switch mode power supply that is intended to boost/increase the input voltage of an unregulated DC supply to a stabilized higher output voltage. Similar to a buck converter, a boost converter relies on an inductor, diode, capacitor, and power switch regulate the output voltage, but they are arranged differently.

Even boost converters have quite a few applications ranging from-

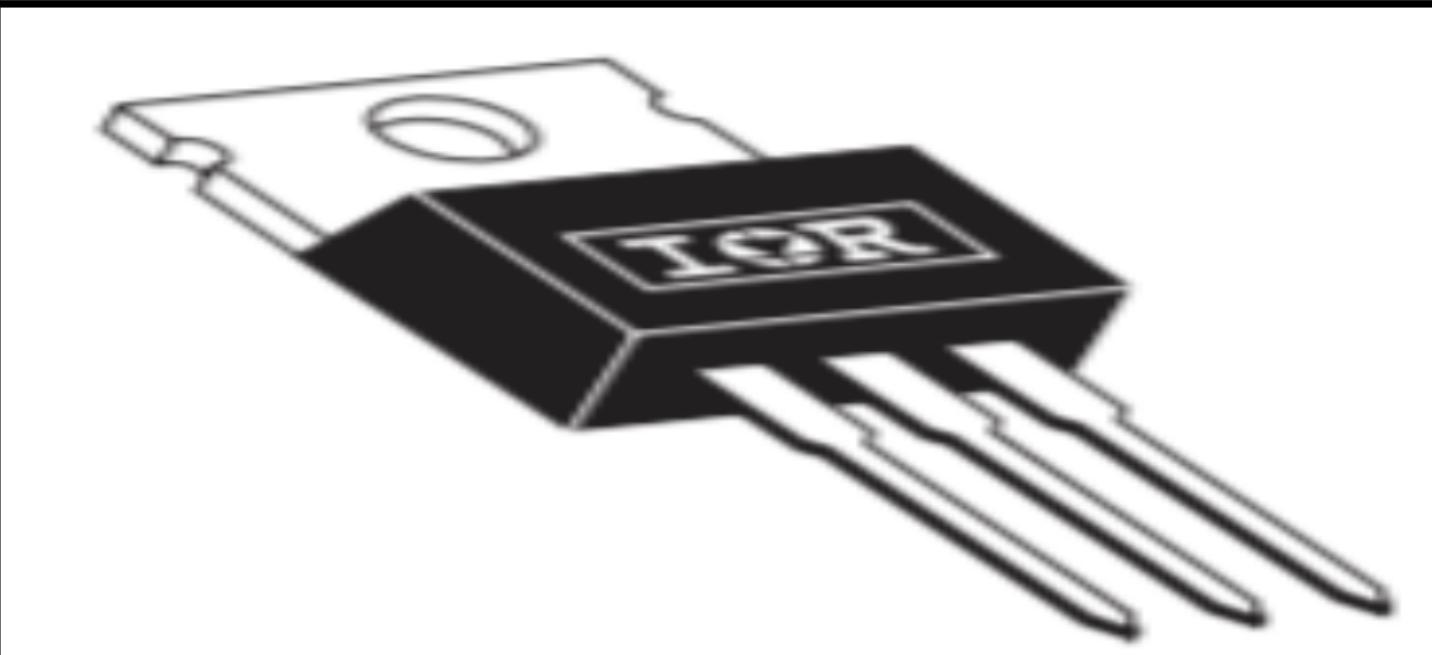
- Automotive applications
- Power amplifier applications
- Adaptive control applications
- Battery power systems
- Consumer Electronics
- Communication Applications



COMPONENTS

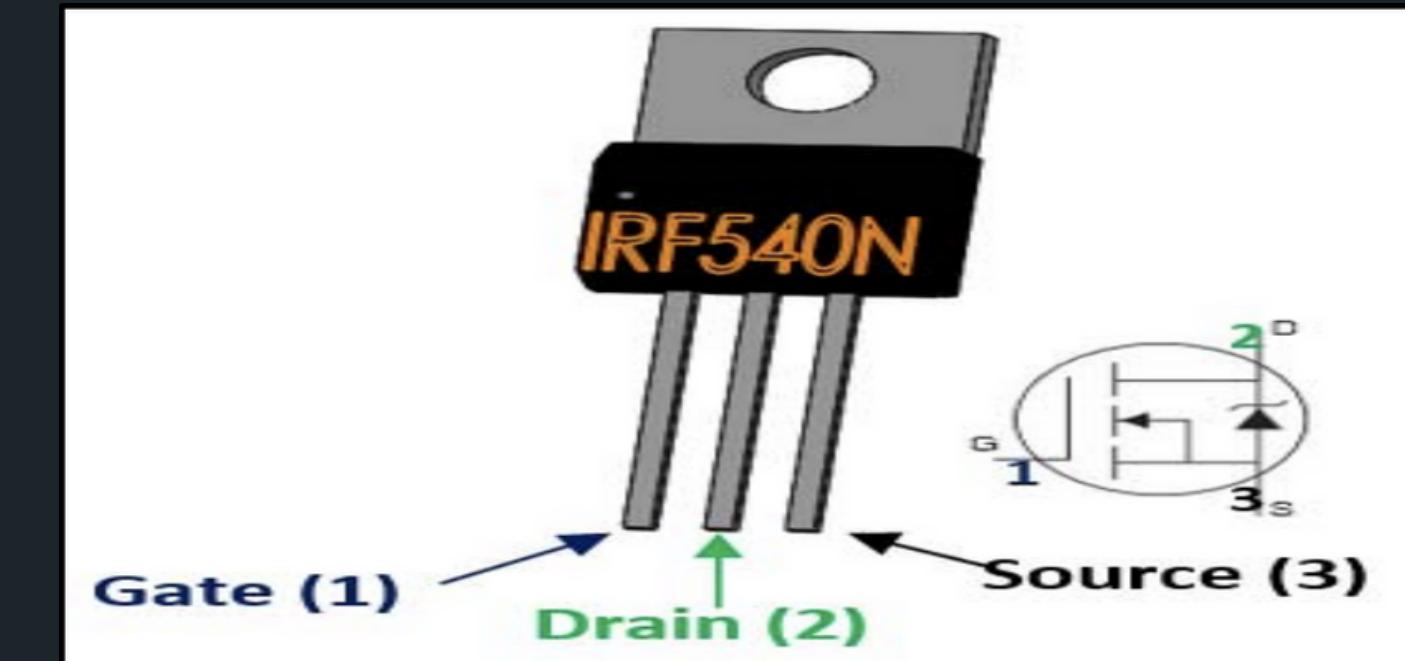
IRF6215 MOSFET (BUCK CONVERTER)

- IRF6215 IS A -150V SINGLE P-CHANNEL HEXFET (POWER MOSFET).
- FIFTH GENERATION HEXFETS FROM INTERNATIONAL RECTIFIER
- FAST-SWITCHING SPEED AND RUGGEDIZED DEVICE DESIGN.
- POWER DISSIPATION LEVELS TO APPROXIMATELY 50 WATTS.
- OPERATING TEMPERATURE UP TO 175 DEGREES CELSIUS.



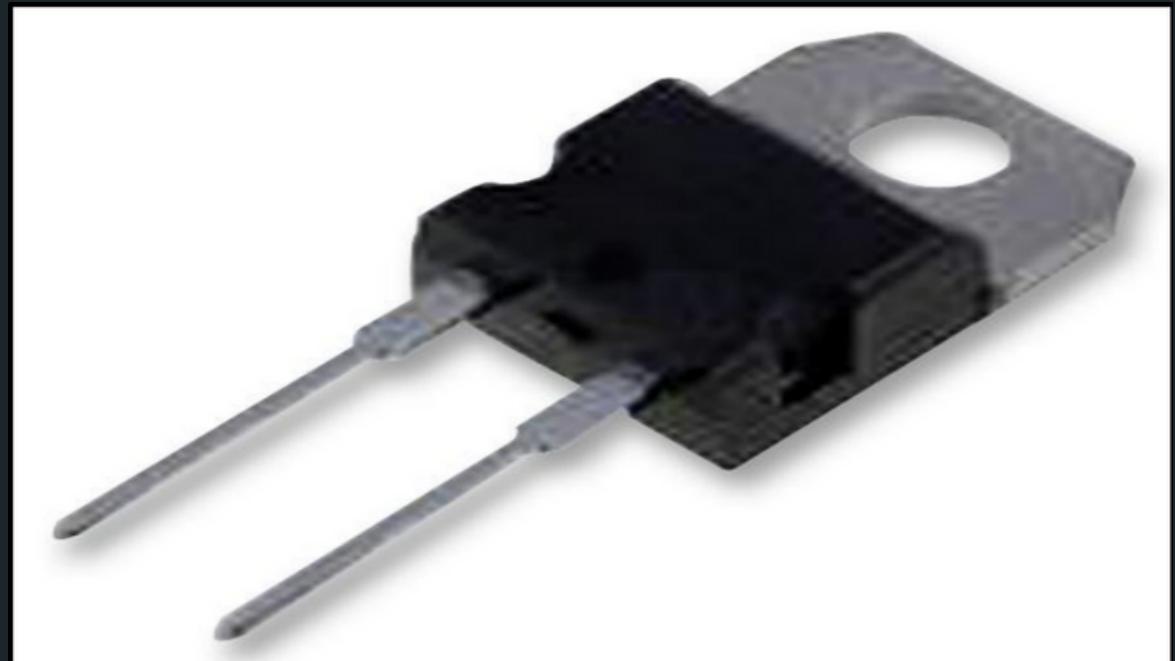
IRF540N MOSFET (BOOST CONVERTER)

- IRF540N IS 100V SMALL SIGNAL N-CHANNEL, POWER MOSFET.
- ADVANCED HEXFET (POWER MOSFET) FROM INTERNATIONAL RECTIFIER
- FAST-SWITCHING SPEED AND RUGGEDIZED DEVICE DESIGN,
- A MAXIMUM OPERATING TEMPERATURE OF 175 DEGREES CELSIUS.
- POWER DISSIPATION LEVELS TO APPROXIMATELY 50 WATTS.



6TQ045 Diode

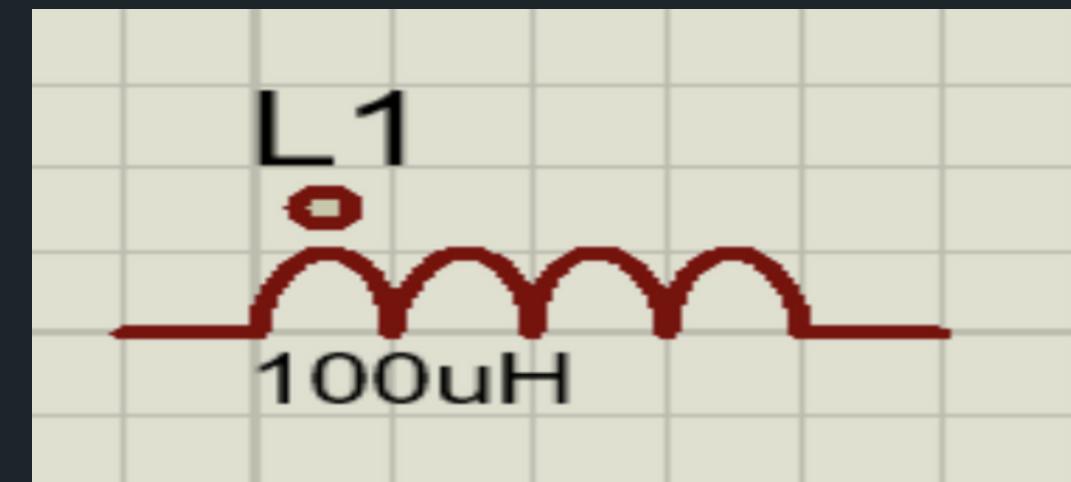
- Schottky rectifier series diode.
- Reliable operation up to 175 °C junction temperature.
- Suitable for high frequency operation and low forward voltage drop.
- The maximum DC reverse voltage it can withstand is 45 V.



Voltage Source-12V



Inductor-100uH



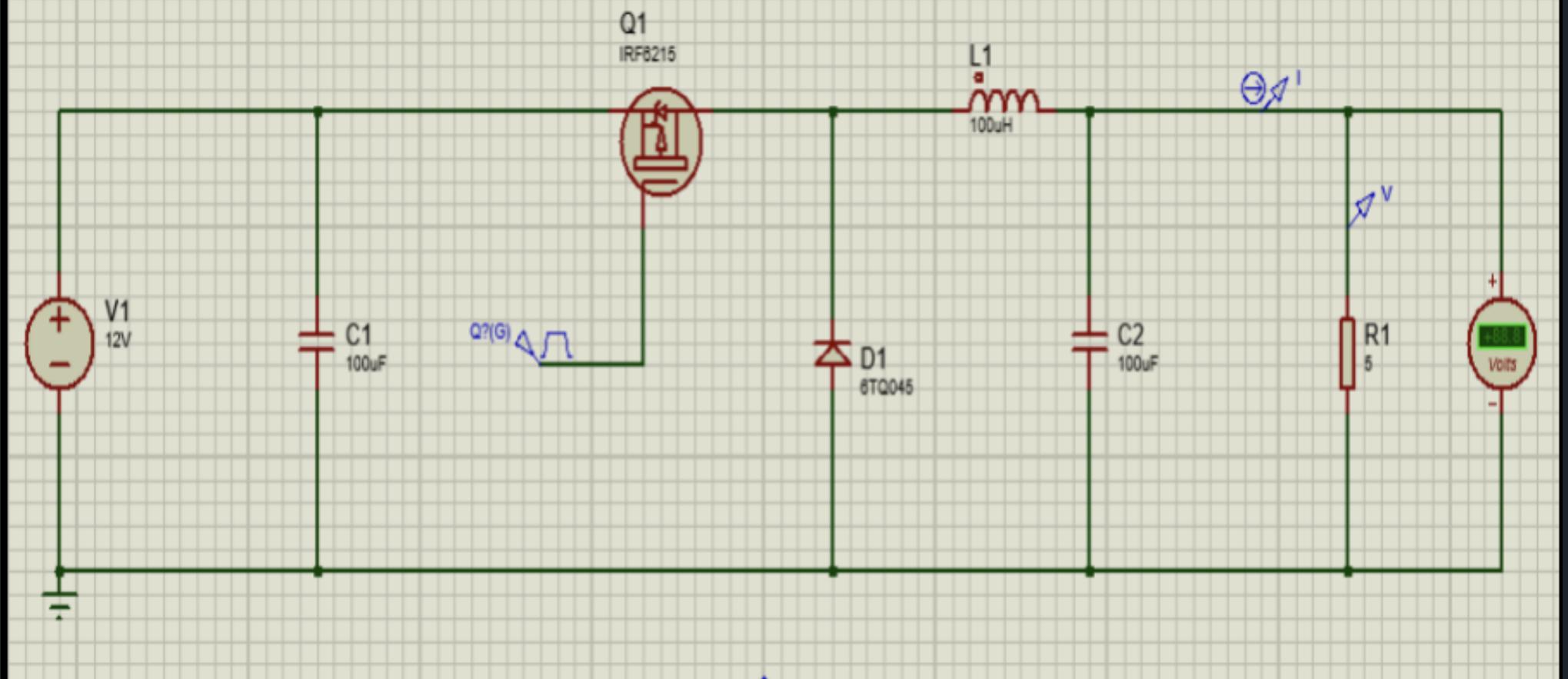
Capacitor- 2X100uF



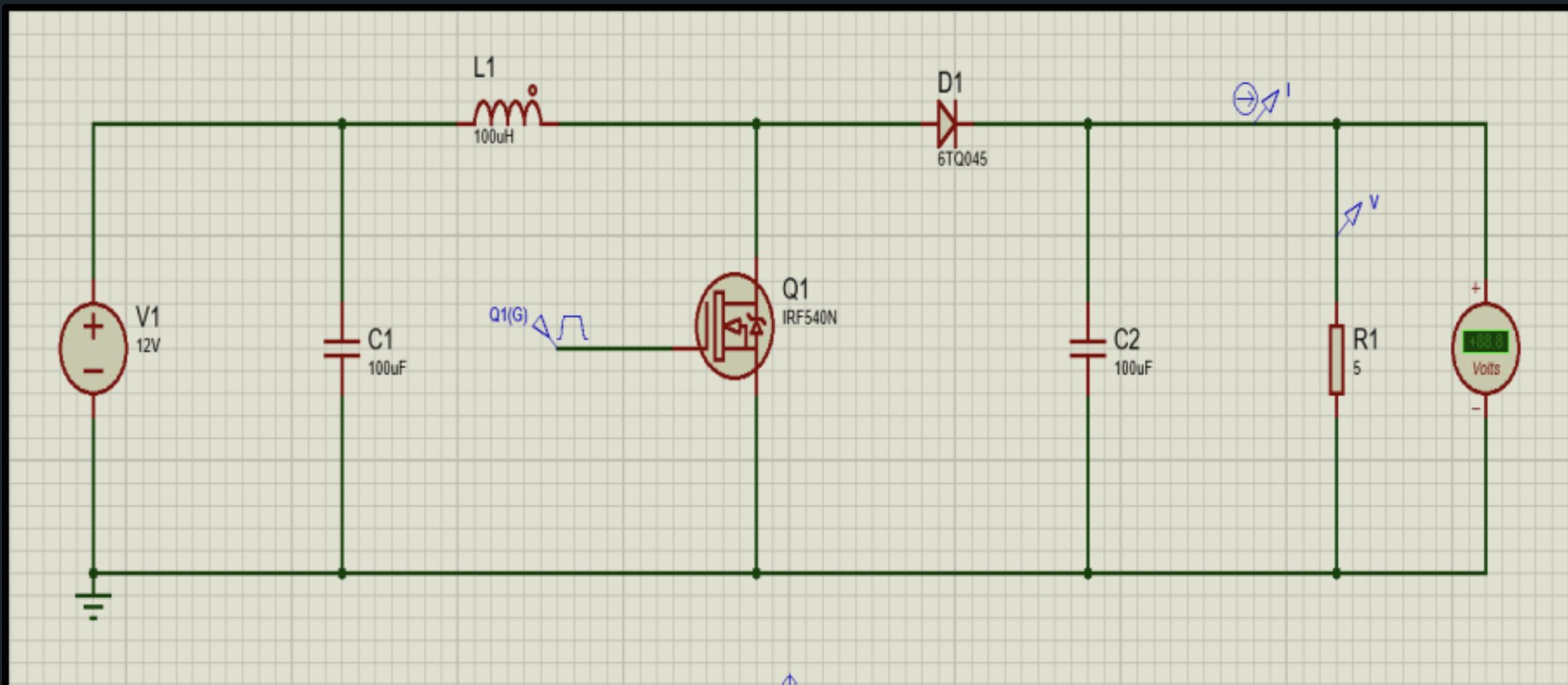
Resistor-5ohm



Final Schematic- Buck Converter

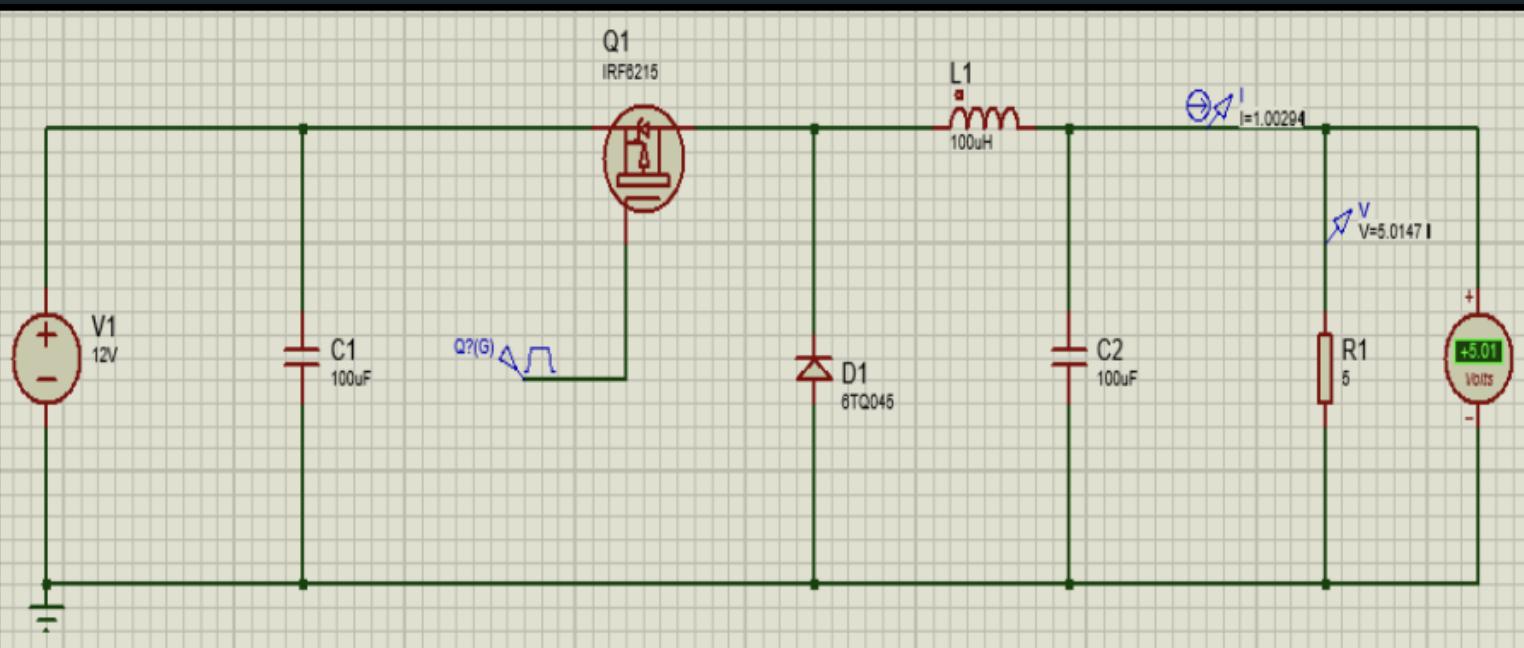


Final Schematic- Boost Converter

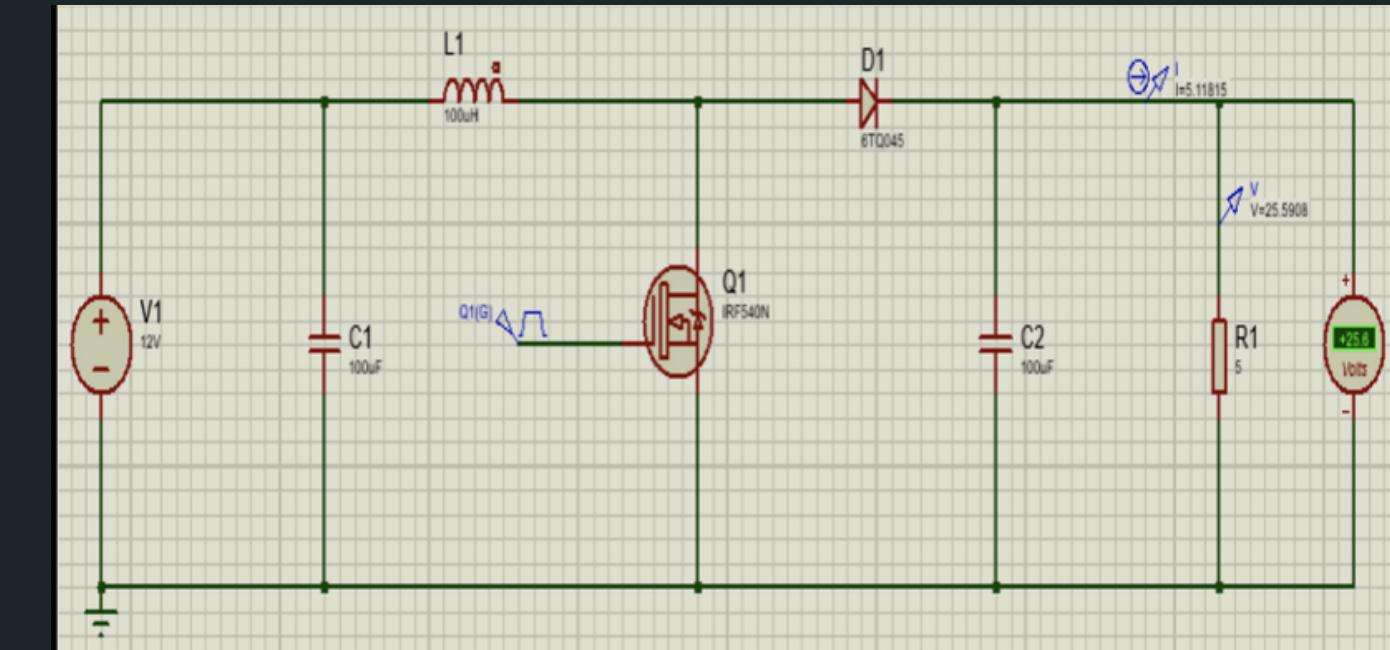


SIMULATION

BUCK CONVERTER



BOOST CONVERTER



GRAPH



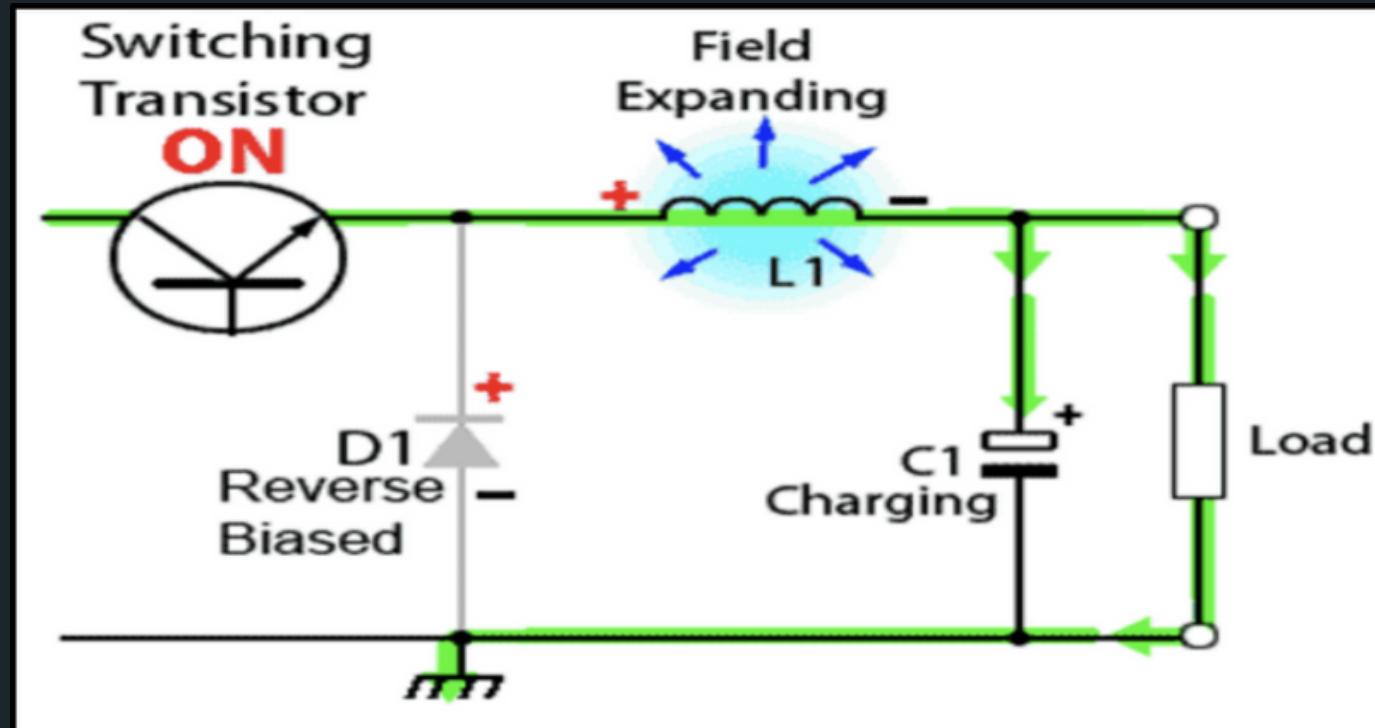
GRAPH



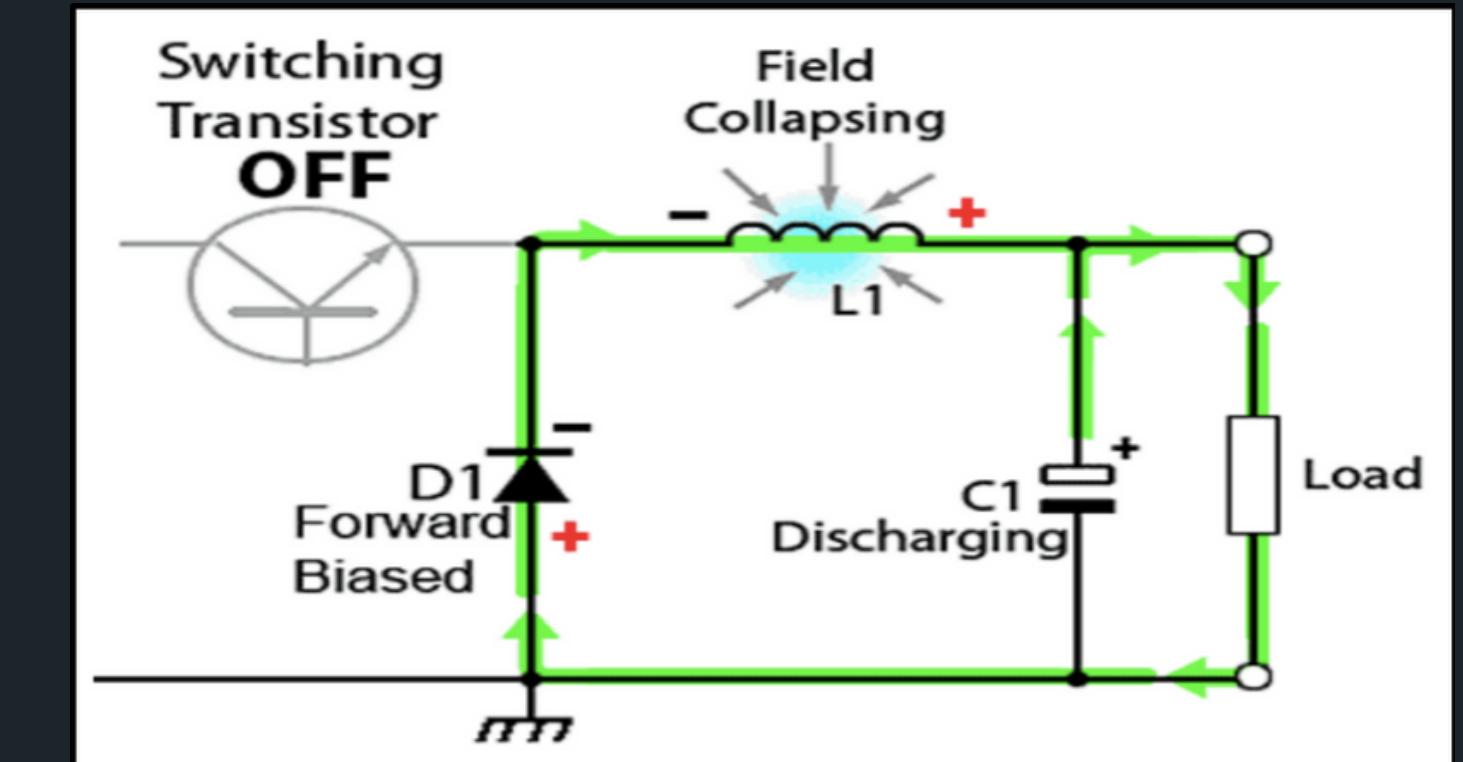
WORKING

Buck Converter

Step-1 When MOSFET switch is closed

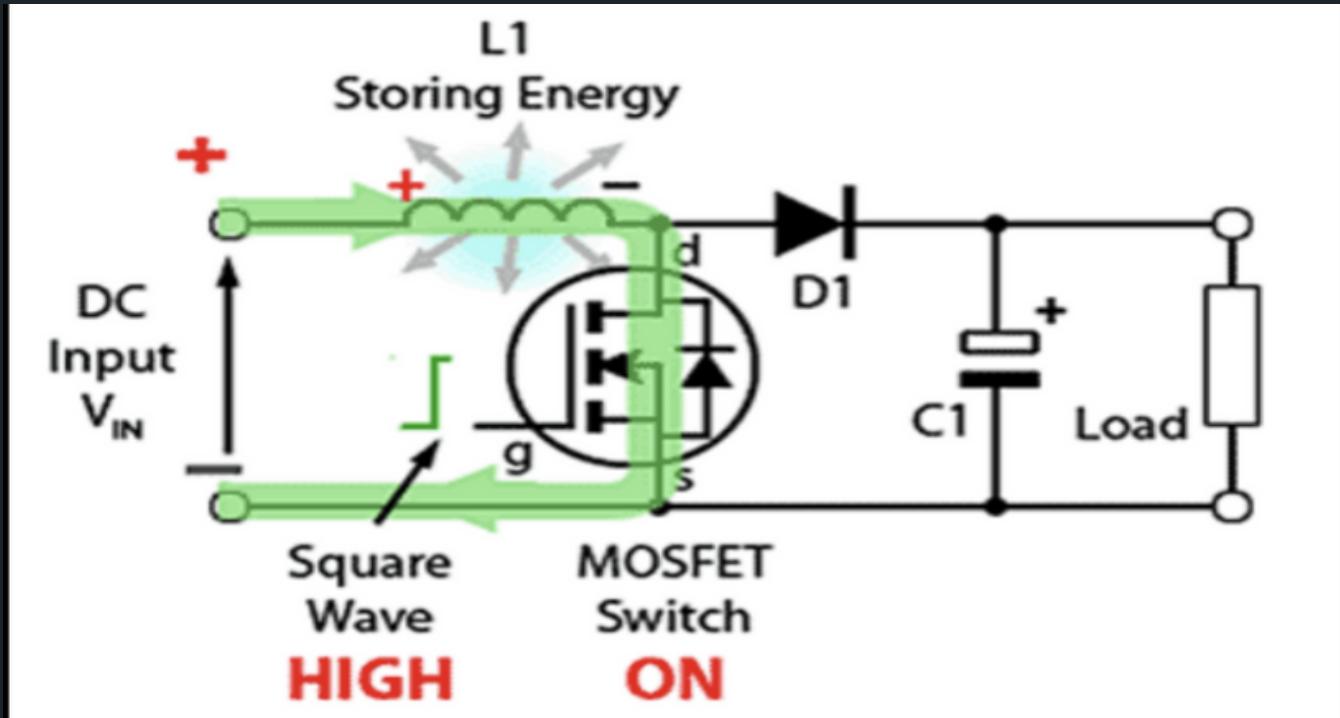


Step-2 When MOSFET switch is open

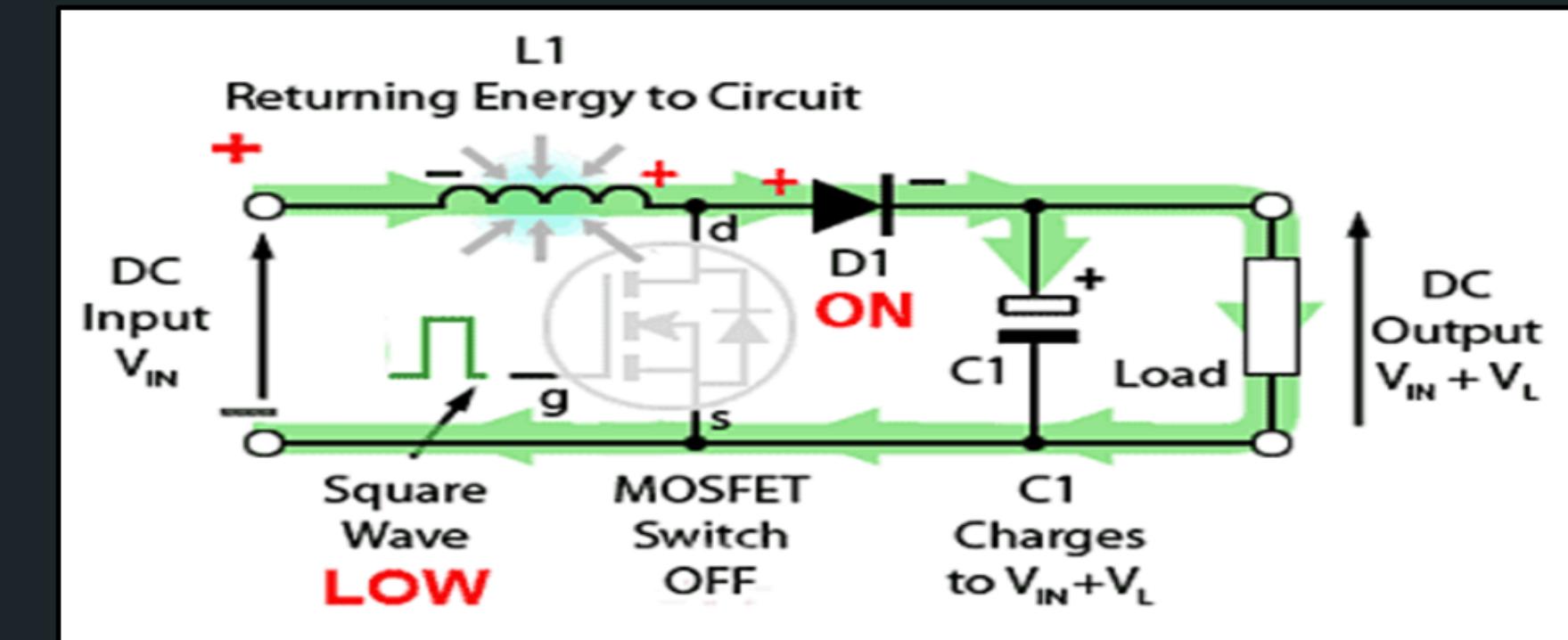


Boost Converter

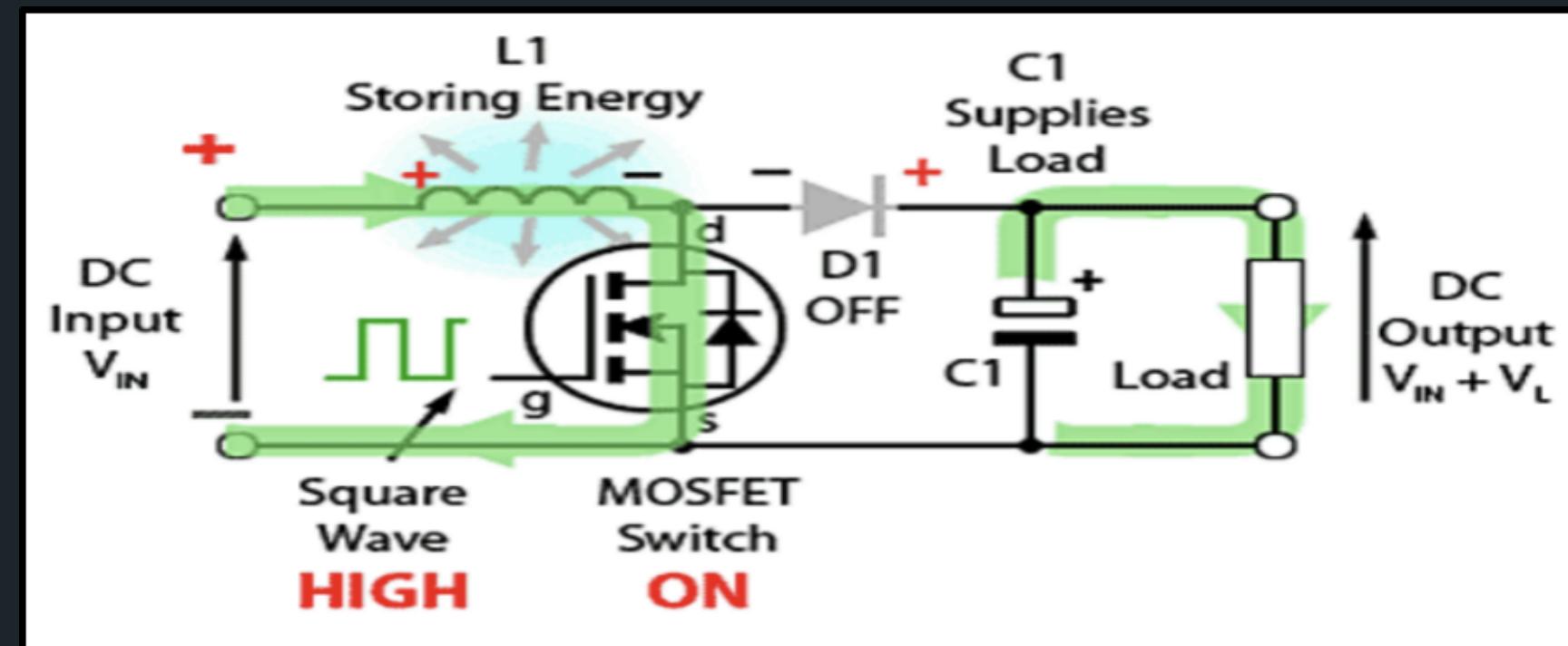
Step-1 When MOSFET switch is closed



Step-2 When MOSFET switch is open

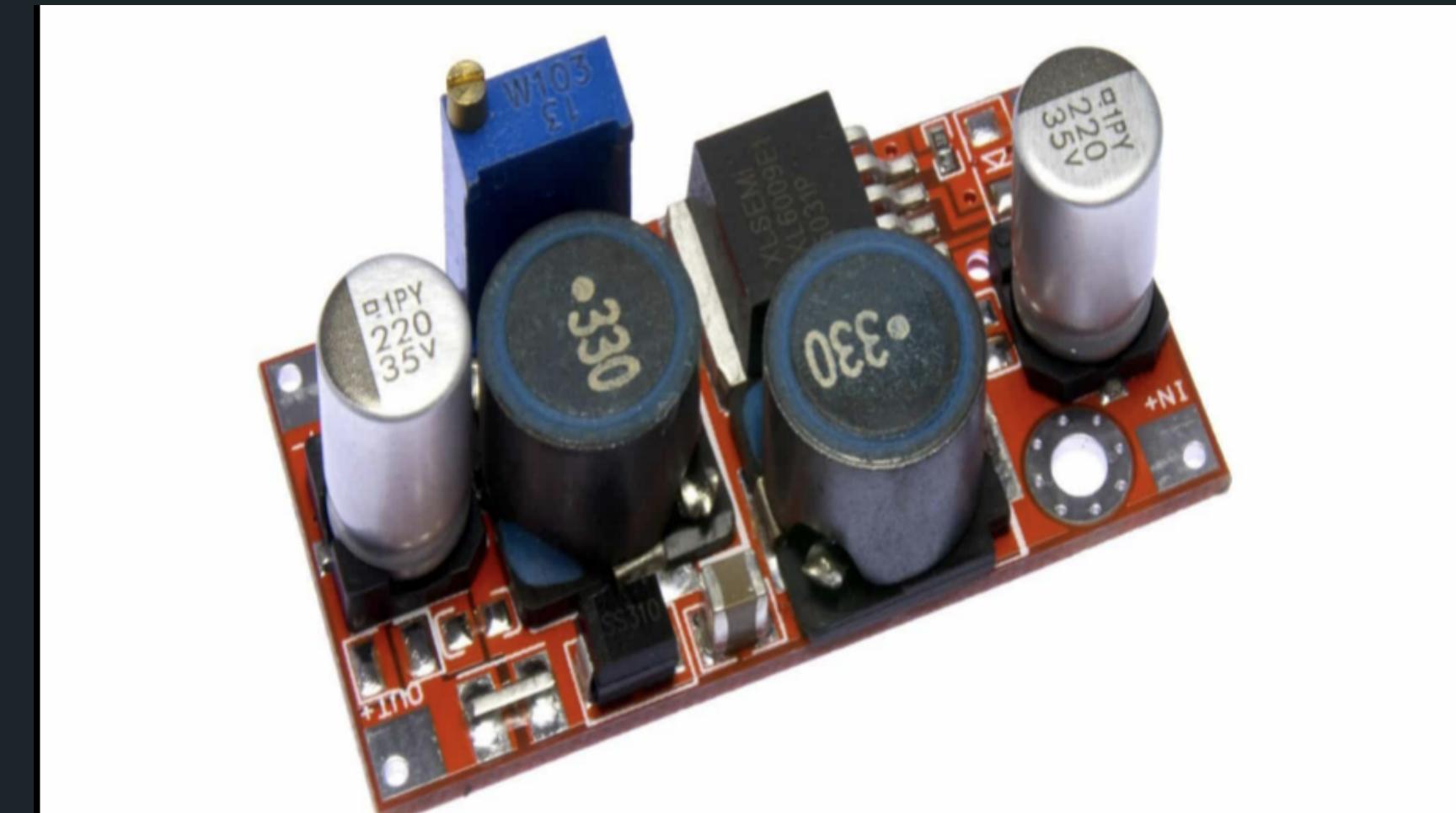


Step-3 When MOSFET switch is closed again



CONCLUSION

- We have discussed in detail the basic components and working associated with buck converters and boost converters in general.
- We also managed to simulate both the converters in proteus and managed to get the desired and satisfactory results by follow the due process.
- In case of buck converter, we managed to step down 12V DC to 5V DC.
- In the scenario of boost converter we managed to step up 12V DC to 25.6V DC.





**THANK
YOU**