

International Islamic University Islamabad

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POWER ELECTRONICS

DC-DC Boost Converter

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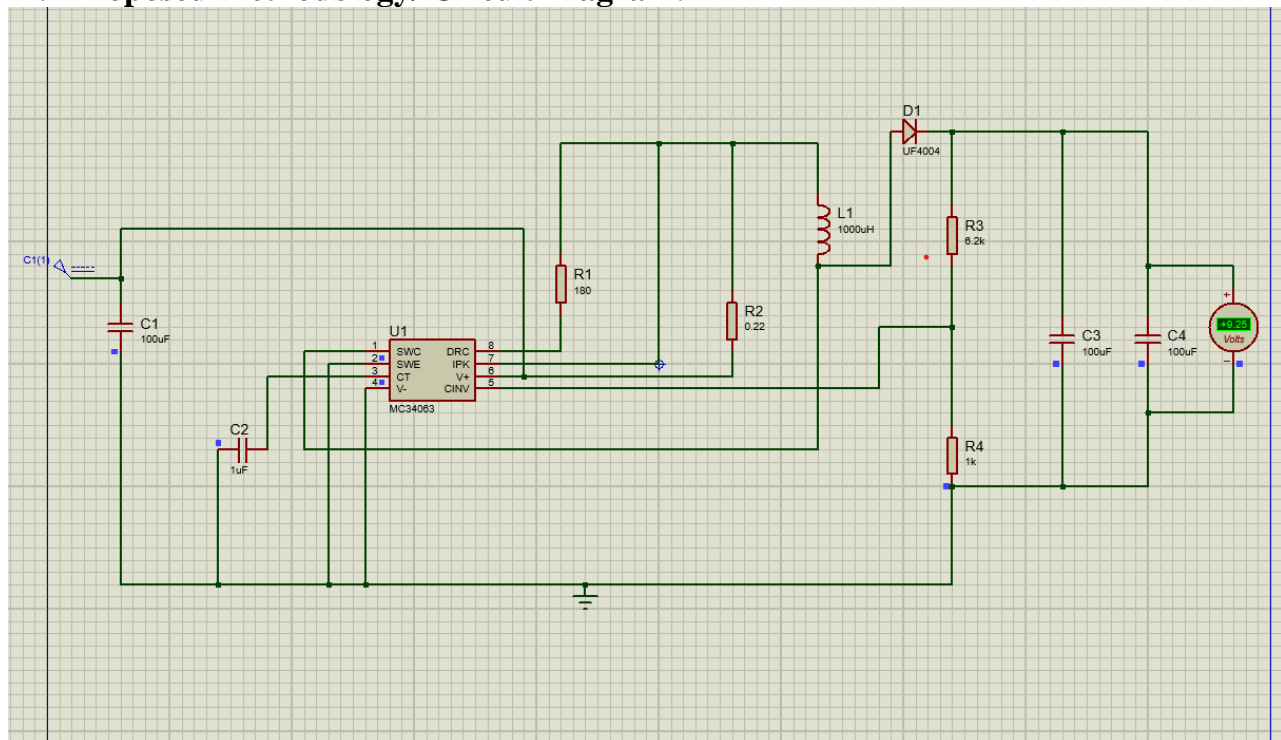
Submitted To:

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1. Introduction:

A 3.7V to 9V Boost Converter Circuit using MC34063 DC-to-DC converter IC. Most of the time we only have a battery as a power source. The lithium-Ion or Lithium Polymer Battery can produce a voltage of 3.7V. The 3.7V may not be enough to drive certain circuits where the power requirement is high. Hence, we need to convert the low power DC, to high power DC without the need for any additional large component. In this case DC-to-DC converter comes into the frame. DC-DC converters are widely used to efficiently produce a regulated voltage from a source that may or may not be well controlled to a load that may or may not be constant. A Buck Converter outputs a lower voltage than the original voltage, while a Boost Converter supplies a higher voltage. In this circuit we will convert the voltage from Lithium-Ion Battery to 9V. The device uses an inductor and a few resistors or capacitors along with **MC340C3** IC. The 3V to 9V Boost Converter Circuit can be used to power the device that requires higher voltages for operations.

2. Proposed Methodology/ Circuit Diagram:



3. Working/Operation:

A 3.7v to 9v boost converter operates by taking a low voltage DC input (3.7v) and using a switching circuit to "step up" the voltage to a higher output (9v). This is achieved through an inductor that stores energy during the "on" phase of the switch and releases it back to the circuit during the "off" phase, ultimately increasing the voltage. Additional components like capacitors and diodes smooth the output and protect the circuit from fluctuations.

4. Application:

➤ Battery-powered devices:

Boost converters can increase the voltage from low-voltage batteries (e.g., 3.7V lithium-ion) to power higher-voltage circuits (e.g., 5V or 12V) for various electronic devices.

➤ LED drivers:

Boost converters provide a stable and efficient way to drive high-brightness LEDs by converting a lower voltage DC input to a higher voltage needed for LED operation.

➤ Electric vehicle charging:

Boost converters play a crucial role in electric vehicle charging systems by increasing the voltage from the grid to the required level for battery charging.

➤ Renewable energy systems:

For generating electricity from renewable sources like solar panels, boost converters are used to increase the low DC voltage output to a higher voltage suitable for grid connection or battery storage.



