COMSATS University Islamabad – Abbottabad Campus

Department of Electrical and Computer Engineering

Project report: CPE-222 – Electric Circuit Analysis-II

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INVERTER CIRCUIT

Introduction:

In this project we are making a simple Inverter Circuit using IC-CD4047. It will convert DC current into AC current. Inverters drive power from DC power banks, like lead pack batteries and convert it into AC current. This type can be used for medium power applications.

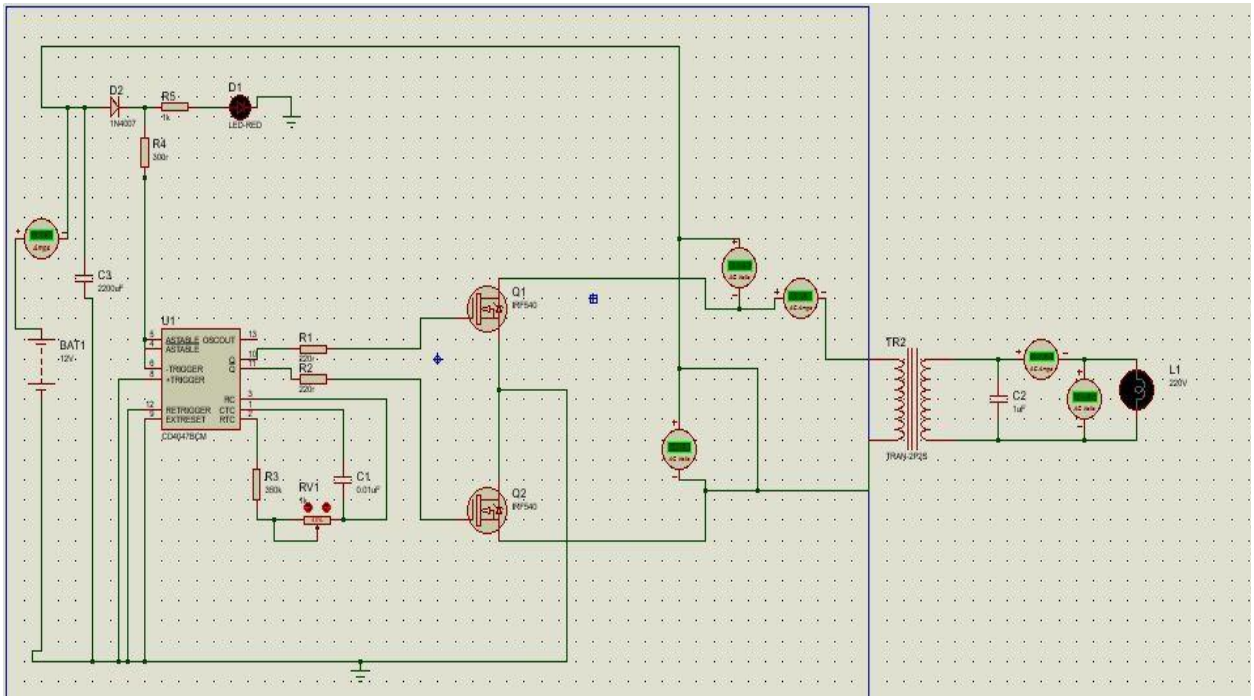
Components:

- Battery – 12V, 7Ah
- IC – CD4047
- MOSFET IRF540
- Resistor – 330 ohms
- Resistor – 1k ohm
- Resistor – 220 ohms
- Resistor – 390k ohms
- Diode – 1N4007
- Capacitor – 2200uF/25V
- Capacitor – 0.01uF
- Capacitor – 0.1uF
- Transformer – 24VA

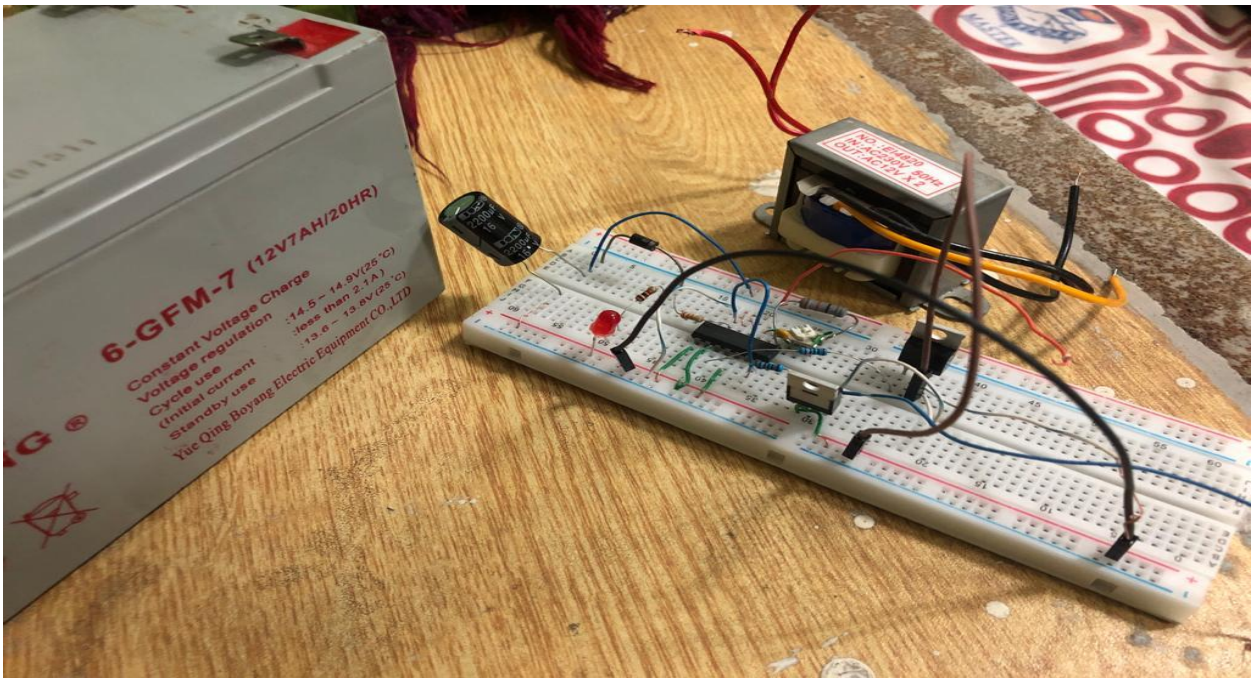
Working:

CD 4047 is a low power CMOS astable/monostable multivibrator IC. Here it is wired as an astable multivibrator producing two pulse trains of 0.01s which are 180 degrees out of phase at the pins 10 and 11 of the IC. Pin 10 is connected to the gate of Q1 and pin 11 is connected to the gate of Q2. Resistors R3 and R4 prevents the loading of the IC by the respective MOSFETs. When pin 10 is high Q1 conducts and current flows through the upper half of the transformer primary which accounts for the positive half of the output AC voltage. When pin 11 is high Q2 conducts and current flows through the lower half of the transformer primary in opposite direction and it accounts for the negative half of the output AC voltage.
Here the MOSFETs are acting as electric switches oscillating at 50 Hz frequency. This frequency is provided by the IC which acts as an oscillator.

Circuit Diagram:



Hardware:



Applications:

Applications of inverter circuits are wide. From homes to offices, inverter circuits are used in various appliances. Also, the power that they convert is also used in different appliances. They include:

- Inverter circuits are used in induction heaters, controlling electric motors
- UPS (Uninterruptible Power Supply)
- Refrigerators
- Their current converted is used to power up Television
- Mobile Phones
- Computer

Motivation:

As compared to generators which use petrol or gas, inverter circuits are cost effective as they use DC power banks like batteries to generate electricity. We all face power cuts in our houses or offices at some time or another. At those times we generally use a Generator or an Inverter. It's beneficial to use invertor circuits for medium power applications.

Conclusion:

Thus it can be concluded that invertor circuit is a useful circuit that has many benefits as and is easy to build. Also it is portable and can be installed anywhere easily. So keeping the needs of today's world, it is noteworthy circuit.