

2K20/EC/016 AGAM SHARMA

ELECTRONICS & COMMUNICATION ENGINEERING DEPARTMENT (DTU)

DC CONVERTER: -

A **DC-to-DC converter** is an electronic circuit or electromechanical device that converts a source of direct current (DC) from one voltage level to another. It is a type of **electric power converter**. Power levels range from very low (small batteries) to very high (high-voltage power transmission).

DC to DC converters is used in portable electronic devices such as cellular phones and laptop computers, which are supplied with power from batteries primarily. Practical electronic converters use switching techniques. **Switched-mode DC-to-DC converters** convert one DC voltage level to another, which may be higher or lower, by storing the input energy temporarily and then releasing that energy to the output at a different voltage.

MATERIALS USED:

MATERIALS USED	DESCRIPTION	Quantity
Resistor	1k	1
Resistor	4.7k	1
Capacitor	0.1uf	1
Capacitor	470pf	1
Capacitor	1000uf	1
Diodes	1N4148	2
Diode	1N4007	1
Potentiometer	47k	1
MOSFET	IRFZ44N	1
Inductor	100u	1
555 timer	555	1

WORKING

Timer IC 555 is configured in Astable multivibrator mode to produce Continuous pulse output, by the value of RV1 variable resistor we can increase or decrease the output pulse frequency.

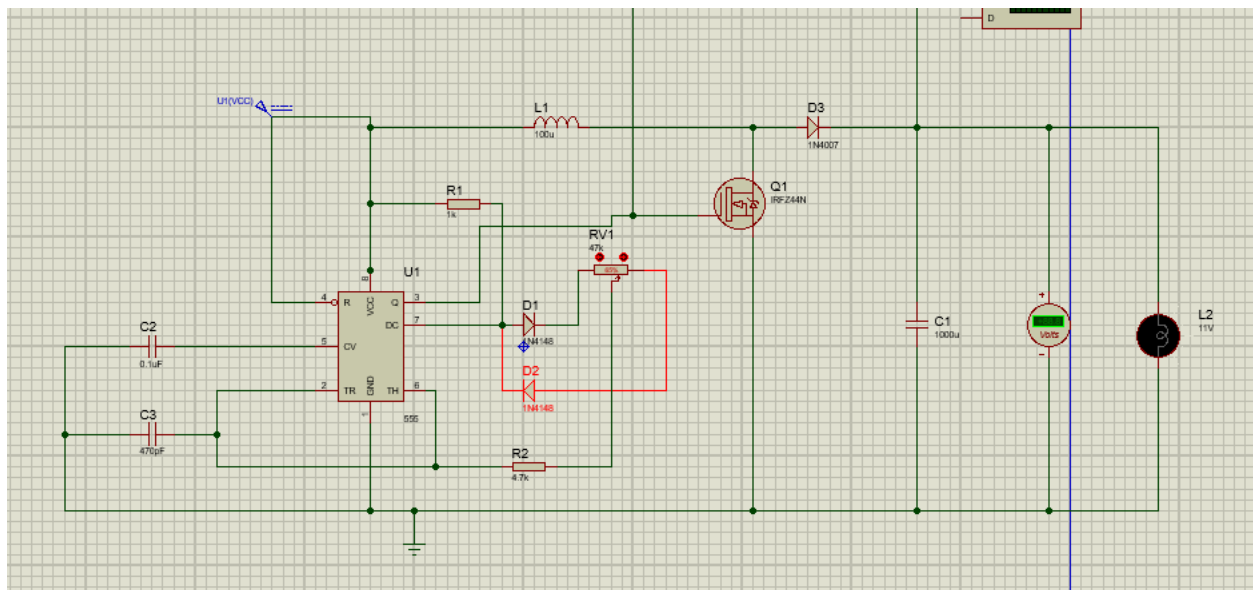
$$\text{period} = t_H + t_L = 0.693(R_A + 2R_B)C$$

$$\text{frequency} \approx \frac{1.44}{(R_A + 2R_B)C}$$

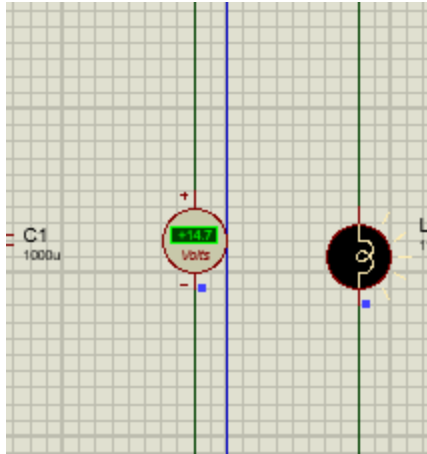
Here $R_A = R1$, $R_B = RV1$ and $C = C1$.

Output pulse from the timer IC is applied to the transistor base (Q1), here transistor Q1 acts as a switch, Collector terminal of Q1 is connected to the positive power supply through Inductor L1 and emitter terminal is connected to the negative supply. Boosted output voltage is taken from the L1 and Q1 meet point and then Rectified by the diode D1. C3 capacitor removes ripples and noise from the output voltage.

SCHEMATIC DIAGRAM IN PROTEUS:



When a dc input is applied of 6V,



Output received at voltmeter is 14.7