K.G. ENGINEERING INSTITUTE

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-::BISHNUPUR ::: BANKURA::-

Project Work on :- Inverter

Project Report by –

NAME	**SOUMYADEEP KARMAKAR**
DEPARTMENT	**ELECTRONICS & TELECOMMUNICATION ENGINEERING**
ROLL	**DKGETCES6**
NO.	**10013612**
REGISTRATION NO.	**D181913635**

July, 2021

INDEX

CERTIFICATE OF APPROVAL

This is to certify that the project titled "***INVERTER***" carried out by

NAME	***ROLL***	***NO***	***REGISTRATION NO.***
SOUMYADEEP KARMAKAR	DKGETCES6	10013612	D181913635

for the partial fulfilment of the requirements for Diploma in Electronics and Telecommunication Engineering from K.G Engineering Institute, West Bengal is absolutely based on his own work under the supervision of Mr. Somnath Banerjee. The contents of this thesis, in full or in parts, have not been submitted to any other Institute or University for the award of any degree or diploma.

…….

Mr. Somnath Banerjee

Head of the Department,

Electronics and Telecommunication

Engineering ,

KGEI

DECLARATION

"We Do hereby declare that this submission is our own work conformed to the norms and guidelines given in the Ethical Code of Conduct of the Institute and that, to the best of our knowledge and belief, it contains no material previously written by neither another person nor material (data, theoretical analysis, figures, and text) which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text.

……

SOUMYADEEP KARMAKAR

ROLL- DKGETCES6,

NO.- 10013612,

REG. NO.- D181913635

CERTIFICATE of ACCEPTANCE

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Name of the Examiner Signature with Date

1. ……..

2.……

3.……

4. ……

GENERAL DESCRIPTION OF PROJECT

What is inverter?

► A power inverter, or inverter, is a power electronic device or circuitry that changes direct current (DC) to alternating current (AC). The input voltage, output voltage and frequency, and overall power handling depend on the design of the specific device or circuitry. The inverter does not produce any power; the power is provided by the DC source.

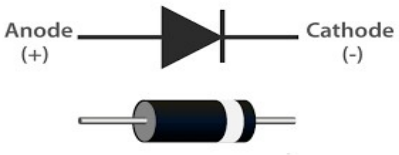
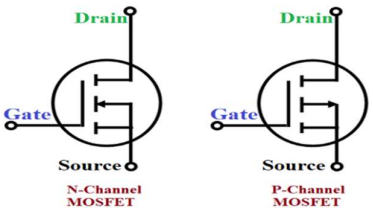
How a inverter works?

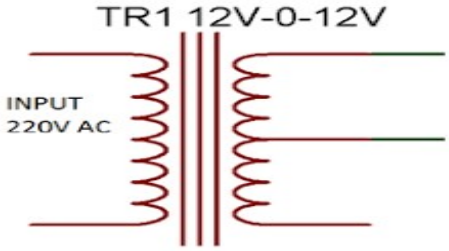
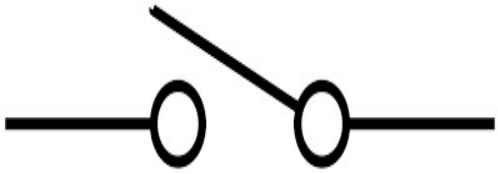
► **W**hen the AC mains power supply is not available, an oscillator circuit inside the inverter produces a 50Hz MOS drive signal. This MOS drive signal will be amplified by the driver section and sent to the output section. MOSFETs or Transistors are used for the switching operation. These MOSFETs or Transistors are connected to the primary winding of the inverter transformer. When these switching devices receive the MOS drive signal from the driver circuit, they start switching between ON & OFF states at a rate of 50 Hz. This switching action of the MOSFETs or Transistors cause a 50Hz current to the primary of the inverter transformer. This results in a 220V AC or 110V AC (depending on the winding ratio of the inverter transformer) at the secondary or the inverter transformer. This secondary voltage is made available at the output socket of the inverter.

LIST OF COMPONENTS USED & ITS COSTING

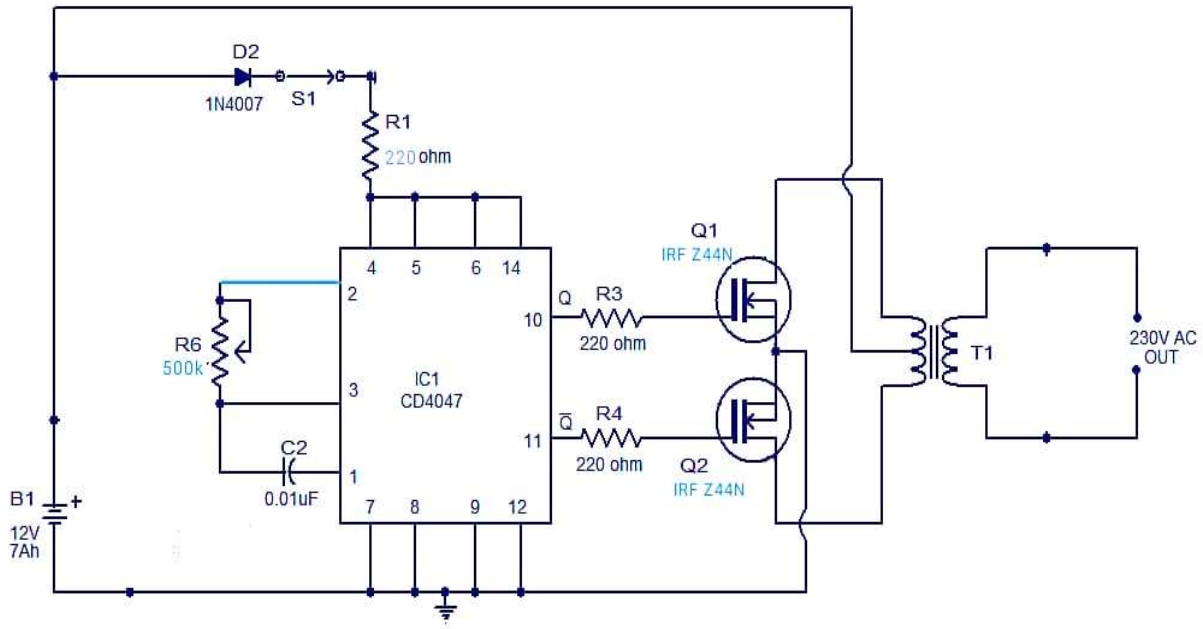
Sl No.	Components	Quantity	Price/pcs in INR	Total Price of Components in INR
1	CD4047 BE 14 PIN IC	1	40/-	40/-
2	14 PIN IC BASE	1	14/-	14/-
3	IRF Z44N MOSFET	2	20/-	40/-
4	220 ohm register ¼ watt	3	1/-	3/-
5	Preset / Variable register	1	5/-	5/-
6	Non-polar capacitor(0.01uF 450v)	1	10/-	10/-
7	1N4007 Diode	1	1/-	1/-
8	Switch	2	10/-	20/-
9	Point Vero board	1	25/-	25/-
10	12-0-12 transformer 1.5 Amps	1	100/-	100/-
TOTAL PRICE				***258/-***

LIST OF SYMBOLS & UNITS OF COMPONENETS

Sl no.	***Component Name***	***Symbols***	***Unit***
1	RESISTOR		Ohm(Ω)
2	CAPACITOR		farads (F)
3	DIODE		……
4	MOSFET		……
5	VARIABLE REGISTOR		Ohm(Ω)

Sl no.	***Component Name***	***Symbols***	***Unit***
6	BATTERY SOURCE		Ampere hour (Ah or amp hr)
7	12-0-12 TRANSFORMER		……..
8	SWITCH		…….

Circuit diagram of Inverter



In this fig. the connection of circuit is shown

Working of the components particularly :

Working of 0.01uF capacitor & 500k preset/variable registor : The non-polar 0.01uF or 104j pF capacitor is used between pin no. 1 & pin no. 3 to generate pulse of 10Hz – 1KHz according to the datasheet of ***cd4047b ic*** .

The 500k preset is used to control the pulse.

Working of 220 Ohm registors: This 220 Ohm registers are used as a protection registors of the circuit , if there is any fluctuation of current in the circuit it helps to protect the circuit.

Working of IRF Z44N mosfets : This mosfets are used as a driver in the circuit. The mosfets here take input of the pulse generated from the CD4047B IC and drive it to the transformer.

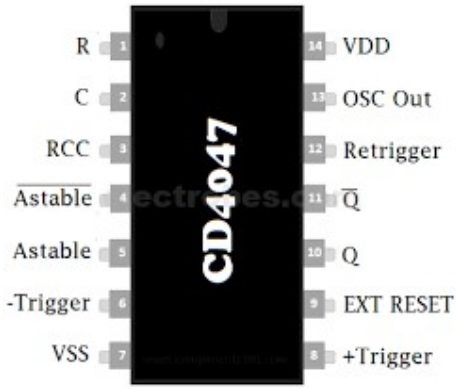
Working of the Transformer : Here a 12-0-12 to 220v transformer is used to step up the pulse driven by the IRF Z44N mosfets and give a 220v AC output which is used to turn AC appliances when the electricity is not available.

Working of Switch : Switch is used to turn on/off the circuit according to our need.

Working the 1n4007 Diode : The can flow current in one direction only. In this circuit the 1n4007 diode is used to control flow of the current nly from 12v DC battery to the inverter circuit.

Working of CD4047BE IC : CD4047B consists of a gatable astable multivibrator with logic techniques incorporated to permit positive or negative edge-triggred monostable multivibrator action with retriggering and external counting options.

Here CD4047B is used as a Astable multivibrator to generate a free running 50% duty cycle pulse from 12V DC input.



PIN OUT OF CD4047B IC

Application of Inverter

There are many applications of inverter, such of them are :

1. An **uninterrupted power supply (UPS)** supplies AC power with the help of an inverters and battery combination.

2. **Speed Control of Electric Motor:** An inverter is designed to produce a variable output voltage and by controlling the output voltage of the inverters, we can control the speed of an electric motor.

3. In the compressor of refrigerator and air-conditioner: In the simple inverters, the single-speed compressor switches on and off periodically. But in inverters compressor, **VFD** (variable frequency drive) used to control the speed of compressor motor and according to this control of cooling is done.

4. **Solar:** Output of solar PV panels is DC. So, we have to convert it to AC for that inverters are used.

5. **HVDC transmission line:** For bulk power transmission, the HVDC transmission line has more advantages than the HVAC transmission line. In this transmission network, power generated in AC and convert in DC with the help of a rectifier and transmit this DC power for long-distance. The inverters used to convert the power into AC at the receiving end of the transmission line.

Acknowledgement

Patience and preservation is the part & parcel to make fulfill any desired motto successful. Not only this two indispensable characters but also kind operation and zestful help are always required with which one can be able to reach his ultimate goal after passing through a series of several incidents. Likewise we do have the pleaser to expose that we have completed my project on "INVERTER". So, at the very outset I deeply feel like expressing my indebtedness and gratitude to all concerned, unless who's help, valued suggestions, guidance and moral boosting, the presence of the work of mine would not have been possible. In the beginning, I do express my heartfelt gratitude in deep humility to MR. Somnath Banerjee (PROJECT Supervisor) who has provided us with the facilities in achieving the objective to prepare the project work. I also express our sincere thanks from bottom of the heart to MR. Tanmoy Ghosh (Honorable Principal)who's valuable and priceless suggestions helped me at various stages of the project.

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[Signature of Project Supervisor]