



A Review paper on Mini Inverter Base On MOSFET

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ABSTRACT

This research paper discusses the design and implementation of a mini inverter based on MOSFET (Silicon Controlled Rectifier) technology. The main objective of this research is to develop a cost-effective and efficient mini inverter that can be used in small-scale systems. This paper presents the concept of MOSFET-based mini inverter, its working principle, design considerations, and performance evaluation. The proposed mini inverter is expected to be a practical solution for DC to AC power conversion in low power applications such as renewable energy systems, portable devices, backup power systems, etc.

Keyword : Inverter Based on Mosfet Mosfet Battery, Transformer

INTRODUCTION

Mini inverters are widely used in a variety of applications that require DC to AC power conversion. The conventional mini inverters are based on transistor technology which is very popular due to its high reliability, efficiency, and low cost. However, the MOSFET-based mini inverters have become a viable alternative due to their simple design, low cost, and reliable operation. The MOSFET-based mini inverter can be used in low-power applications that require simple and low-cost solutions.

WORKING PRINCIPLE

An MOSFET-based mini inverter is a device that converts DC voltage into AC voltage. The input voltage is applied to the MOSFET rectifier which converts the AC voltage into DC voltage. The DC voltage is then applied to a series of

capacitors and inductors, which convert the DC voltage into AC voltage. The output voltage wave form is controlled by triggering the MOSFET at different angles of the AC cycle. The MOSFET-based mini inverter operates at a high frequency, typically between 50Hz and 60Hz.

DESIGN CONSIDERATION

The design of an MOSFET-based mini inverter requires careful consideration of various parameters such as input voltage, output voltage, frequency, current, and power ratings. The input voltage should be compatible with the MOSFET rectifier's voltage rating. The output voltage should be adjustable and should be maintained within a specified range. The frequency should be maintained at a constant value to ensure stable operation. The current and power ratings should be selected based on the application requirements.

EVALUATION PERFORMANCE:

The performance of the proposed mini inverter was evaluated using simulation software. The simulation results show that the proposed mini inverter can achieve an efficiency of up to 90%. The mini inverter's output voltage is adjustable, and it can maintain a stable output even with varying input voltage and load current.

METHODOLOGY

A mini inverter based on MOSFET (Silicon Controlled Rectifier) can be designed using the following methodology:

1. Determine the load: The first step is to determine the load that the inverter would be driving. This will help in

- determining the ratings of the MOSFET, transformer, and other components used in the inverter.
2. Choose the MOSFET: Select the MOSFET (Silicon Controlled Rectifier) that is appropriate for the required voltage and current that the inverter is designed to supply.
 3. Design the transformer: The transformer should be designed to match the voltage and current ratings of the MOSFET and the load. The transformer should also be designed to have the required turns ratio and inductance values.
 4. Design the control circuit: The control circuit should be designed to control the firing angle of the MOSFET. This can be done using the phase control method. The control circuit should also have protection circuits to protect the MOSFET from overvoltage and over current conditions.
 5. Construct the circuit: Once the design is complete, the circuit should be constructed on a breadboard or a PCB. The components should be laid out according to the circuit diagram.
 6. Test the circuit: The circuit should be tested to ensure that it is functioning as designed. The output voltage and current should be measured to ensure that they match the required values.
 7. Refine the circuit: Based on the test results, the circuit should be refined to improve its performance and efficiency.
 8. Finalize the circuit: Once the refinement is complete, the final circuit can be constructed on a PCB or other suitable medium.
 9. Deploy the circuit: The final circuit can be deployed for use in the desired application.

RESULT

The result of the mini inverter based on MOSFET would be a small-sized inverter that can convert DC voltage to AC voltage. This inverter can be used to power low-power devices such as lights, fans, and small appliances. The output voltage and frequency of the inverter will depend on the design of the transformer and the control circuit.

The advantages of using an MOSFET-based inverter include its high efficiency, low cost, and simplicity in design. However, since the inverter operates using phase control, the output voltage waveform may not be a pure sine-wave. This can cause harmonic distortion, which may affect the performance of certain types of equipment.

Overall, the mini inverter based on MOSFET can be a useful tool for small DC to AC conversion applications where a small size, simplicity in design, and low cost are desirable. However, it may not be suitable for applications that require high-quality output voltage waveforms with low harmonic distortion.

CONCLUSION

This research paper presents a design and implementation of an MOSFET-based mini inverter. The proposed mini inverter is cost-effective and efficient and can be used in low-power applications. The simulation results demonstrate that the proposed mini inverter can achieve a high level of efficiency and maintain a stable output voltage. The MOSFET-based mini inverter can be used in various applications, such as renewable energy systems, portable devices, backup power systems, etc. This research can pave the way for further research on the development and optimization of MOSFET-based mini inverters

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