



INVENTORS

MOHD HAFIZ ARSHAD
BAHARUDDIN ISMAIL
AZRAL MUKMIN AZMI
MOHD SYAHRI NOOR SHAH
DR. MUZAMIR ISA
MOHD ZULHISHAM MOHD RADZI

CONTACT DETAILS

School of Electrical System Engineering
University Malaysia Perlis (UniMAP)
e-mail: hafizarebad12@gmail.com

SINGLE PHASE CASCADED MULTILEVEL INVERTER WITH SHEPWM SWITCHING TECHNIQUE

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Collaboration with:
leXsolar GmbH
Strehlerer Straße 24
01069 Dresden
Germany

PRODUCT DESCRIPTION

- Single Phase Cascaded Multilevel Inverter with Selective Harmonic Elimination Pulse Width Modulation (SHEPWM).
- Using SHEPWM switching technique, the selected harmonic order can be eliminated and can contribute to the low Total Harmonic Distortion (THD) for the voltage output waveform.
- The field programmable gate array (FPGA) use to generated SHEWPM switching pulses.
- Light and compact design allows the product to be portable.
- The energy from different renewable energy sources can be used simultaneously.
- This product can produce up to 9 levels output waveform with various frequencies and different switching pattern.
- Thus, it gives a lot of potential for research and educational application.
- Capable of generating 240 AC with a maximum power of 1500 Watt.

INVENTION ADVANTAGES

- Choose between different output levels, frequencies and multiple switching angles in real time
- Lower THD
- Higher efficiency.
- Using low switching frequency
- Less weight
- Less cost

NOVELTIES

- Develop programming by using VERILOG VHDL program to generate multiple selected outputs waveform from 3 to 9 levels.
- Selected number of level from 3 to 9 with different frequency from 5Hz to 120Hz. Number of level and frequency will be display at the 7-segment.
- Selected single and multiple switching angles (switching pattern) for each level (from 1 to 3 from the quarter cycle of the waveform). This can be done by using selected level, switching and pattern button.
- Use with the different power source such as wind and solar energy.
- Transformerless.

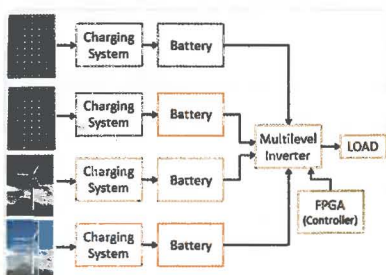


Figure 1: Block Diagram

COMMERCIAL POTENTIALS

- Great potential for education institution such as universities, colleges and the polytechnics that offer electrical and electronics courses for training or study.
- Residential or rural application in alternative energy.

APPLICATIONS

- Renewable energy application
- Multilevel inverter design
- AC Drive
- High Voltage

SPECIFICATIONS

- Peak Power: 1500W
- DC Input Voltage: 90VDC x 4Set
- AC Output Voltage: 240VAC
- AC Output Frequency: 10Hz - 90Hz



Figure 2: Single Phase Cascaded Multilevel Inverter

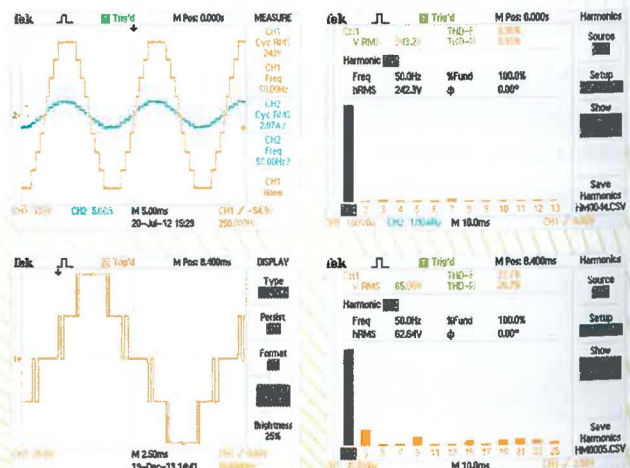


Figure 3: Output Waveform single and multiple switching angles.