DEVELOPMENT OF SINGLE PHASE INVERTER USING BIPOLAR SINUSOIDAL PULSE WIDTH MODULATION (SPWM)

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ABSTRACT

In this research, development of a new approach switching technique of a single-phase inverter is presented. Development of bipolar sinusoidal pulse width modulated inverter is aimed to get the desired smooth sinusoidal waveform with minimum harmonics of about ± 10%. However, practical design of the bridge inverter produce output voltage with certain harmonics not as identical as the desired sinusoidal output voltage of an ideal inverter. The bipolar sinusoidal pulse width modulation or SPWM method is proposed to get the desired waveform through proper design of switching pulse. There are two techniques commonly used in SPWM; bipolar SPWM switching and unipolar SPWM switching. The microcontroller M68HC11E2 is used to program the bipolar sinusoidal pulse width modulation (SPWM) waveform. An assembly language is used as software to program the bipolar SPWM waveform. Designing the switching pulses and the bridge inverter are the main part of this research project. Simulation through a computer aided design tool such as PSpice is used before designing the actual inverter. This new technique can be used to produce a bipolar Sinusoidal Pulse Width Modulation (SPWM) for the application of the inverter circuit.