

ABSTRACT

Nowadays, the need of UPS at the level of both large-scale enterprise to private households already started to rise. The increase usage of UPS was due to a high rate power failure in developing countries which can lead to either damaging electronic devices that are sensitive to power failure and also cause data loss in communication and cloud computing service. One of the standard technology generally used in UPS these days is one with a pure sinusoidal waveform (pure sine wave) output voltage.

There are several ways to generate a pure sinusoidal wave. One of them is by using the concept of sinusoidal pulse width modulation (SPWM). This sinusoidal PWM concept is using standard PWM which its duty cycle varies periodically to generate variable pulse width so as shaping near sine waveform. That sinusoidal PWM will be used to drive the power transistor in full-bridge topology. PWM will be generated from the microcontroller ATMEGA8535 which control the duty cycle of the power MOSFET IRF840 and also control the IC PWM controller KA3525 in PWM DC-DC converter. The output of inverter is filtered using LC low-pass filter and branched in relay between input and output of UPS.

The result of device output test still not satisfy the standard specification output voltage of 220V AC. The output voltage of UPS average is 5.012 V_{rms} . Also, the transfer time average is 1.815 seconds.

Keyword: *UPS, pure sine wave, sinusoidal pulse width modulation, inverters, DC-DC converter*