

Project: Sinewave Generator for Piezoelectric Motors

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ABSTRACT

In the Hi-tech world that we are living in, there are many rapid changes in all fields. The main trend today is to minimize known products in order to make them mobile, light weight and user friendly. This trend did not miss the electronics industry that was seeking more attractive, cheaper and smaller electronic products.

In order to meet these demands, the last decade saw the emergence of a new electronic technology, called Nanotechnology, that specializes in creating and developing very small products. Furthermore, these products need to operate with very high accuracy.

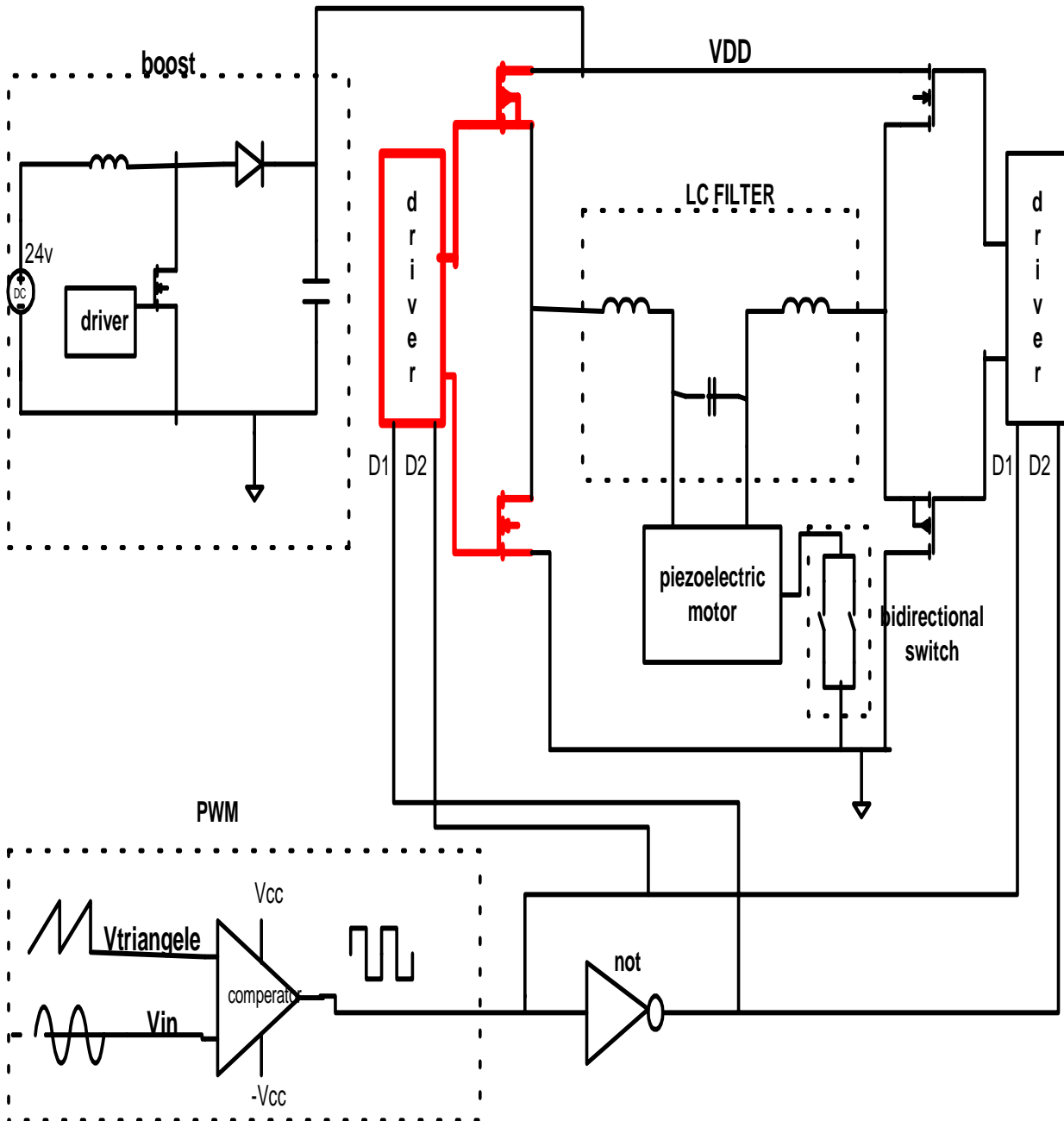
Recently new motors were developed, which make use of the piezoelectric principles and are known as Piezoelectric Motors. The Piezoelectric Motors are small, very accurate, and able to make miniature movements with nanometer precision.

The objectives of this project were to test, analyze, and develop a sinewave generator based on a Class-D high efficiency power amplifier to drive a Piezoelectric Linear Motor. This generator should operate at high frequencies, up to 100KHz, and high voltages up to 270Vrms. The main purpose of the planned generator is to produce a clean sine wave while possessing the ability to control the frequency and signal amplitude in order to attain maximum power and precision.

High efficiency Drivers had to be developed to meet the demand of working in high frequencies up to 10 times the motor frequency. The Drivers make use of

the basic principle of regenerating energy and restoring it back to the main source.

The Sinewave Generator for the Piezoelectric Motor



The High Frequency Driver

