Transformerless Variable Frequency Drive

The project aims at designing a Variable Frequency Drive (VFD) which helps in improving the performance of HVAC systems. The system is capable of directly operating on the supply without reducing it.

Variable frequency drive (VFD) usage has increased dramatically in HVAC applications. The VFDs are now commonly applied to air handlers, pumps, chillers and tower fans. A better understanding of VFDs will lead to improved application and selection of both equipment and HVAC systems.

The projects makes the AC supply to DC supply by the use of Rectifier. The DC obtained is fed to MOSFET driver. The output from MOSFET driver is fed to center tapped step up transformer. A frequency controller interfaced to MOSFET driver varies the AC frequency.

The main objectives of the project are:

1. Generating sine wave AC.
2. To design a system this is capable of varying frequency of the supply.
3. VFD design without using a transformer

The project provides exposure to following technologies:

1. MOSFET driver designing.
2. Frequency controller designing.

The major building blocks of the project are:

1. Rectifier.
2. MOSFET driver.
3. Frequency controller.
4. Center tapped transformer.

Block diagram: