

Design and Implementation of High Bandwidth Power Amplifier for B-H Characterization of Magnetic Materials

By

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Brief description of what the students are required to build in this project (application, performance requirements and constraints)

The experimental characterization of the magnetic core material at low as well as high frequencies is required as machines and converters operate at a wide range of frequencies. For this, power amplifiers having wide bandwidth, high voltage, and current gains, along with low output offset are needed. In this project, students will build high-bandwidth voltage and current amplifiers for B-H characterization of magnetic materials. The setup will look similar to the one shown in Ref 1.

Key technical and user specifications

The designed power amplifier should be capable of characterizing a ferrite core material using the ring-specimen method up to a peak flux density of 0.3 T for a wide frequency range from 50 Hz to 10 kHz.

Deliverable expected

A review of conventional topologies and the new amplifier design should be given. The experimental results of the proposed voltage and current amplifiers and the closed-loop power amplifier need to be presented. Experimental waveforms of secondary induced voltage, core flux-linkage, and primary coil current should be shown. The students should give inputs to extend the frequency range from 10 kHz to 50 kHz.