Immunity Tests of a Class-D Audio Amplifier.

Raghul Prakash
prakasr@purdue.edu

Siddharth Inani
sinani@purdue.edu

Yuichiro Suzuki
suzuki0@purdue.edu

Krister Ulvog
aulvog@purdue.edu

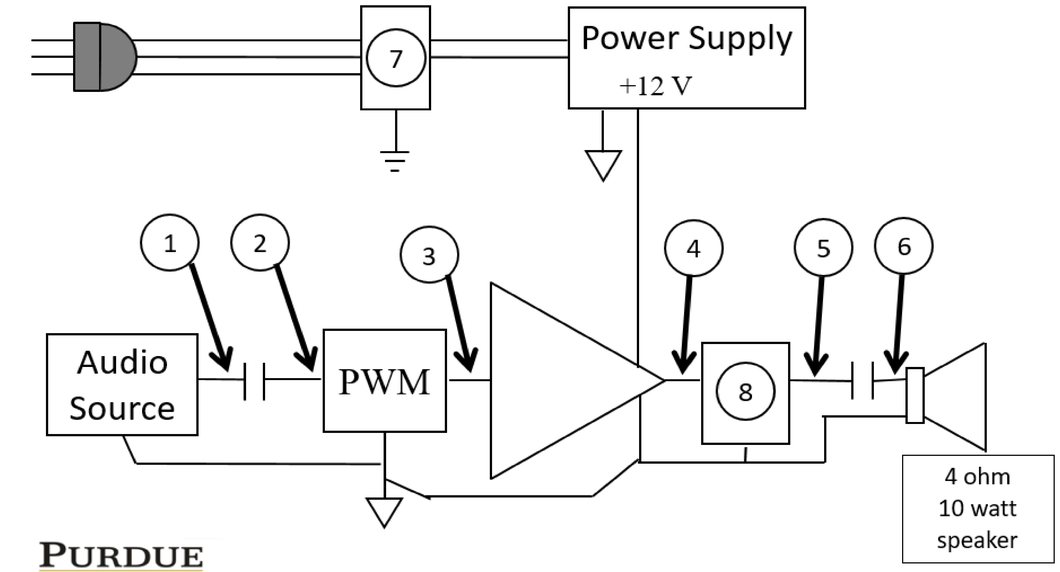
Fiyi Ogunkoya
oogunkoy@purdue.edu

VIP Section: Electromagnetic Compatibility (EMC)/Signal Integrity (Spring 2018)

E-Field Immunity Testing

Team Members: Siddharth Inani, Raghul Prakash, Krister Ulvog, Yuichiro Suzuki
Team Advisors: Prof. J. V. Krogmeier, Prof. Barrett Robinson; Mr. Don Heirman

Circuit Schematic for the Class D Amplifier



Proposal

The project tests the noise immunity of a Class-D Audio Amplifier that we built which uses the Texas Instruments **TPA3122D2** integrated circuit and its output signal performance and integrity when exposed to a controlled electric field source is analyzed . This study was conducted to determine the best PCB layout practices for digital switching circuits that operate at high frequencies which would lead to better EMC design practices.

EXPERIMENT

A high intensity E-field near-field capacitor was designed and constructed and applied to the IC on the printed circuit board of the amplifier. E-Field intensities and output signal distortion were measured using calibrated near-field probes, a spectrum analyzer, and an oscilloscope. It was found that the output waveform was distorted when the E-field source was of high frequency but at relatively low frequencies the coupling capacitor that we added at Stage 1 was able to shunt out the noise