

# Design of a Class D Audio Amplifier IC Using Sliding Mode Control and Negative Feedback

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**Abstract** — In recent years, class D audio amplifiers are becoming the most feasible solution for low-voltage low power applications due to their high efficiency property; however, to obtain good linearity for high fidelity systems is still a challenge. This work does not require the triangular carrier signal used in conventional class D audio amplifiers. This circuit consists of Controller, Comparator, Power stage, and a output filter. Here power stage will be designed with digital signal using Verilog and the other parts will be designed using analog component, so, it can act as a mixed signal.

**Keywords:** Mixed signal, D-amplifier, audio amplifier

## I. Proposed Circuit

In this Circuit Power Amplifier is designed using Verilog code, so it acts as a digital circuit, other than that all the components are designed in analog only.

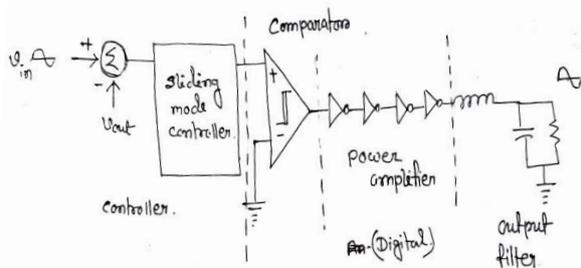


Figure1: Proposed class D audio amplifier conceptual diagram.

## II. Detailed Circuit

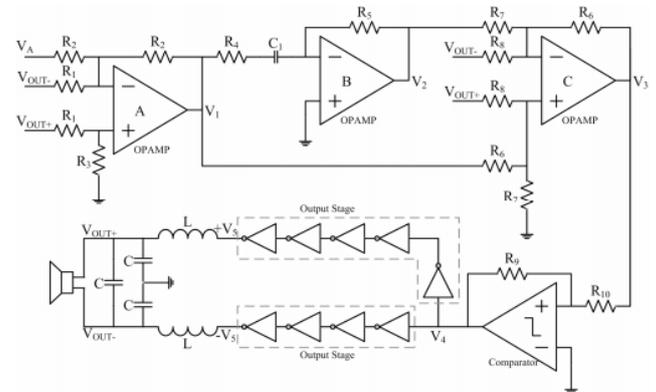


Figure2: Schematic implementation of Proposed class D Amplifier

## III. Expected Waveform

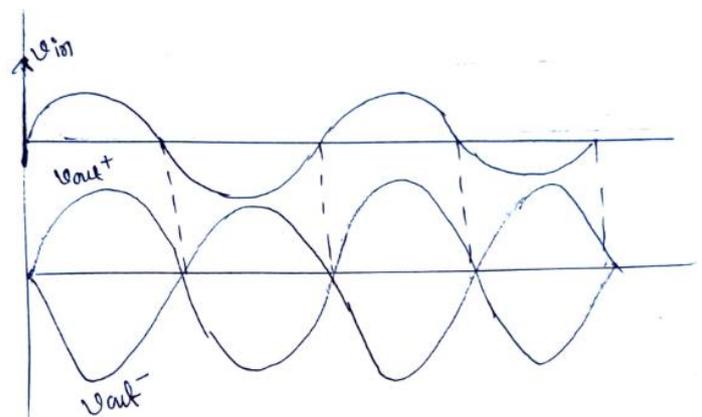


Figure3: Expected waveform corresponding to the input

## IV. References

- [1] B. Putzeys, "Digital audio's final frontier", *IEEE Spectrum*, pp. 34-41, March 2003.
- [2] S. Burrow and D. Grant, "Efficiency of low power audio amplifiers and loudspeakers", *IEEE Trans. on Consumer Electronics*, Vol. 47, No. 3, pp. 622-630, August 2001.