Design of a Class-D Power Amplifier (Audio Amplifier)

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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.

1. Reference Circuit Details

In this circuit 3 Op-Amps are used and 1 Comparator is used, then with comparator different not gate is connected which is designed in Verilog and connect via ADC bridge, after that capacitor and inductors are connected which act as a low pass filter. Output is then again connected to the input of Op-Amp as feedback.

2. Implemented Circuit

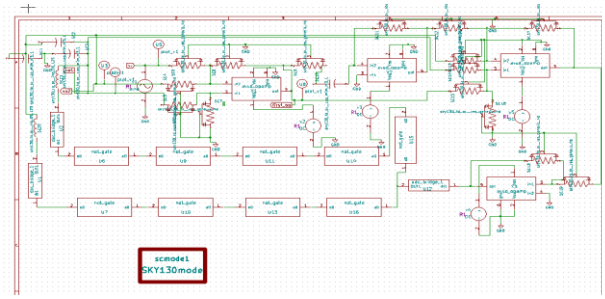
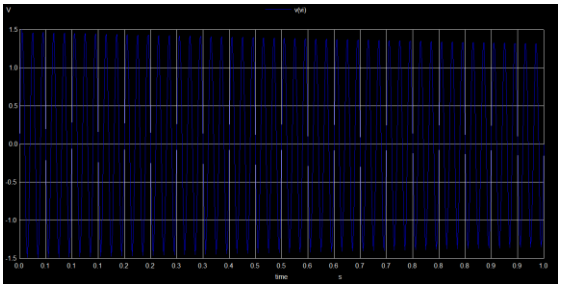


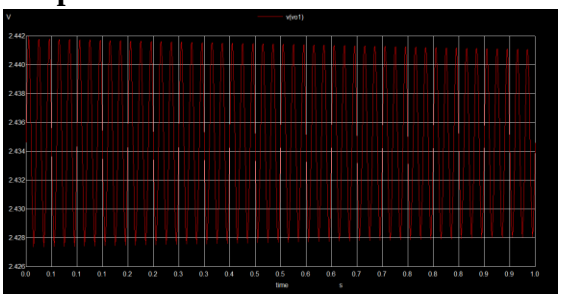
Figure1: Implemented Circuit

3. Implemented Waveform

Input:



Output:



4. 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