

Function Generator

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Abstract

Function generators have versatile applications in electronics. In this work, a function generator has been constructed by cascading three well known circuits – The Wien Bridge Oscillator, Schmitt trigger, Integrator. The Wien Bridge Oscillator has been constructed using JFET and Op Amp; Schmitt trigger using CMOS transistors; Integrator using the RC circuitry. The Wien Bridge Oscillator produces a sine wave that acts as an input to the Schmitt trigger circuit which in turn converts it to a square wave. The square wave is further converted to a triangle wave by the integrator.

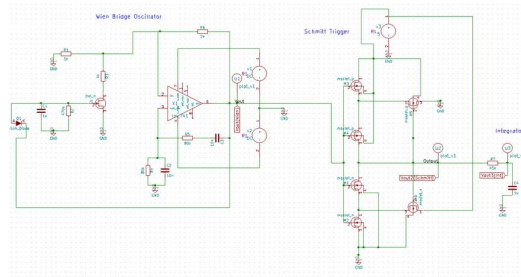
Key words: Waveforms, Analog, Op Amp, Transistors

Reference circuit details

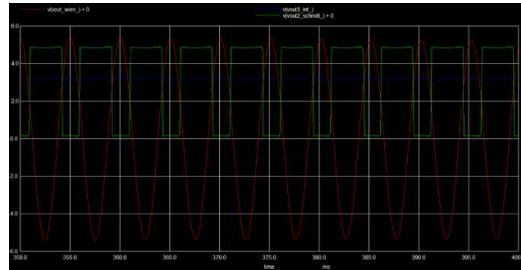
Function generators are standard circuits in the electronics discipline used to produce different kinds of waveforms (usually sine, square, triangle waves). They have wide varieties of applications. In an attempt to design a waveform generator, three standard circuits have been employed. Unlike these circuits that function based only on Op Amps, two of them have been designed separately using different components. Wien bridge oscillator has been constructed using an additional JFET and the Schmitt trigger circuit has been constructed using CMOS (PMOS and NMOS) transistors. RC integrator was used to convert square wave into a triangle wave. Each circuit involves separate circuit analysis and formulae to analyze the working. The circuitry and design have been referred from various sources and were cascaded to get a desired output for suitable applications. However, the circuit design proposed in the literature review did not give the expected results and suitable modifications have been carried out. This could be attributed to the internal parameters and time scale variation in

subsequent circuits while simulating. The modified design produced better results.

Implemented Circuit



Implemented waveforms



References

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