Research Article

Design Of High Precision and Frequency Full Wave Rectifier

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ABSTRACT
This paper presents a novel high frequency and precision full wave rectifier and which can be extensively suitable for the voltage to current conversation and the system compromises the a dual load symmetrical and trans conductance amplifier. The paper can be solely work for the rectification of the by using the grounded resistor with backing of MOS transistor.

Keywords: Full wave rectifier, AC to DC converstion.

Introduction

A rectifier plays a one of the prominent role in the electronic device to convert the full swing wave forms in to DC value. The conventional rectifiers can be built with the help of the diodes, basically it requires 0.7 volts to trigger the diode to ON. Therefore these diodes can normally use in applications where Vt is insignificant, such as RF demodulators and DC voltage supply rectifiers respectively. The precision rectifiers can be extensively used in the many of the non-linear circuits such as watt metres, AC voltmeters, AC voltmeters, triangular wave frequency doubling, function filtering and RMS to DC conversion etc. As a result number of precision rectifiers can be extensively used. Figure 1 indicates the circuit design of the OTA based half rectifier.
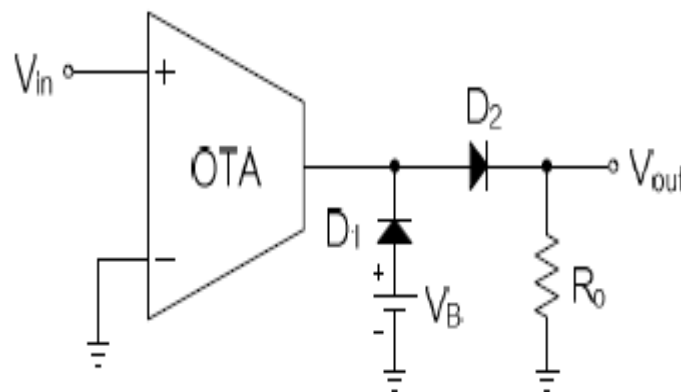

Fig.1: Half wave rectifier using OTA.

Proposed full wave rectifier using OTA

In order to test the ideal design, the scheme of the proposed half-wave rectifier in Fig. 4 is simulated using PSPICE simulation program. For the circuit simulation, 0.5µm CMOS model obtained though MIETEC is used [14]. The W/L parameters of MOS transistors are 25µm/1µm for M1 to M10, 40µm/1µm for M11 to M20, 3.2µm/1µm for MR1 to MR2, 0.6µm/0.6µm for MD1 to MD2 and Ibias=500µm [14].

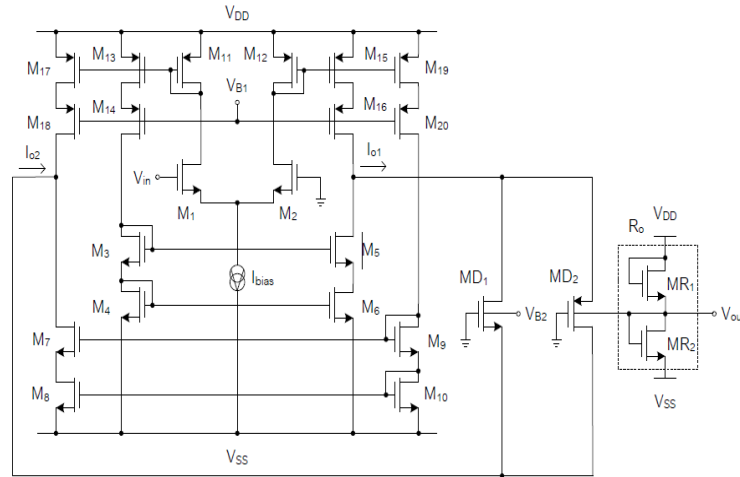**Fig.2: Proposed full wave rectifier**

The supplied voltages used are VDD=−VSS=5V, VB1=2V and VB2=0.9V. The DC transfer characteristics of the proposed full-wave rectifier are shown in Figure 2, which shows the operating voltage ranging from −500mV to 500mV of the input voltage.
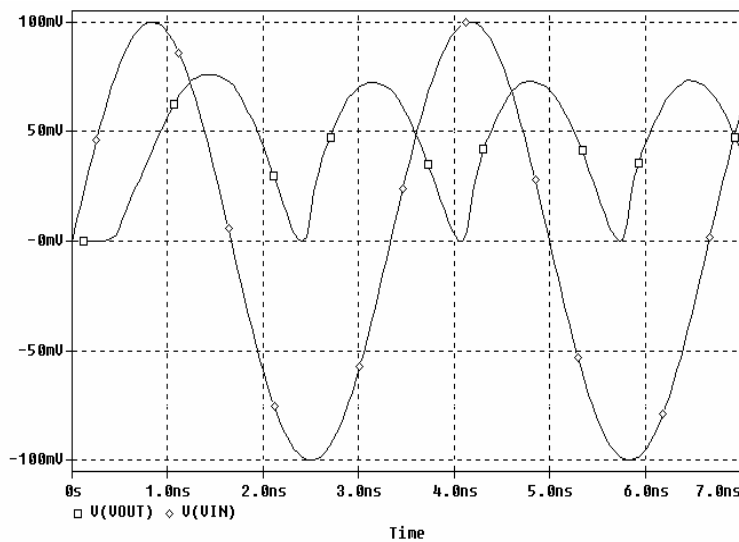

Fig.3: The output of the full wave rectifier which is having the frequency of 300MHZ.

Conclusion
The high frequency and high precision full wave rectifier can be designed using the all MOS transistors and rectifying the by all means of rectification and its yield can be reached to the 88% from the actual value.

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