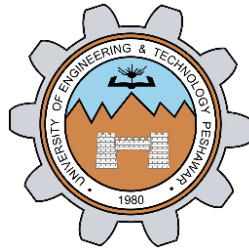


Clippers (Series and Parallel)



Spring 2023

Submitted by: **Hassan Zaib Jadoon**

Registration No: **22pwsce2144**

Class Section: **A**

“On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work.”

Student Signature: _____

Submitted to:

Engr. Usman Malik

Month Day, Year (April 28, 2024)

Department of Computer Systems Engineering
University of Engineering and Technology, Peshawar

Objectives:

In this lab you will learn:

- What is Clipper
- Types of Clippers
- Applications of different Clipper
- Hands on experience of Proteus

Equipment:

- Oscilloscope
- AC Source
- DC Source

Components:

- Diode, Si (1N0047)
- Resistors (1K, 10K and 5K) ohm

Theory:

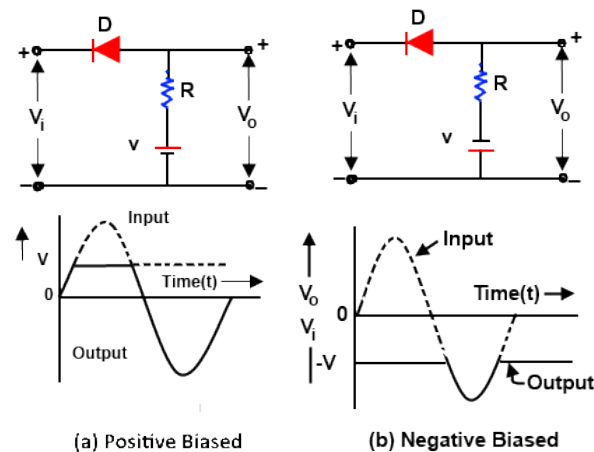
Diode:

A diode is a two-terminal electronic component that conducts current primarily in one direction (asymmetric conductance); it has low (ideally zero) resistance in one direction, and high (ideally infinite) resistance in the other.

Clippers:

Clipper circuits are the electronic circuits that clip off or remove a portion of an AC signal, without causing any distortion to the remaining part of the waveform. These are also known as clippers, clipping circuits, limiters, slicers, etc.:

Circuit:



Working of Clipper Circuit:

The clipper circuit can be designed by utilizing both the [linear and nonlinear elements](#) such as [resistors](#), diodes, or [transistors](#). As these circuits are used only for clipping input waveform as per the requirement and for transmitting the waveform, they do not contain any energy storing element like a capacitor. In general, clippers are classified into two types: Series Clippers and Shunt Clippers.

Applications of Clipper:

- For the generation of new waveforms or shaping the existing waveform, clippers are used.
- The typical application of a diode clipper is for the protection of transistors from transients, as a freewheeling diode connected in parallel across the inductive load.
- They are frequently used for the separation of synchronizing signals from the composite picture signals.
- Clippers can be used as voltage limiters and amplitude selectors.
- The excessive noise spikes above a certain level can be limited or clipped in FM transmitters by using the series clippers.
- A frequently used half-wave rectifier in power supply kits is a typical example of a clipper. It clips either positive or negative half-wave of the input.

Categories of Clipper:

The clipper circuits are generally categorized into three types:

- **Series clippers:** In series clippers the diode is connected in series with the output load resistance.
- **Shunt clippers:** In shunt clippers, the diode is connected in parallel with the output load resistance.
- **Dual Clippers:** When a portion of both positive and negative of each half cycle of the input voltage is to be clipped (or removed), combination clipper is employed. Thus during the negative half cycle the output stays at ' $-V_2$ ' so long as the input signal voltage is greater than ' $-V_2$ '

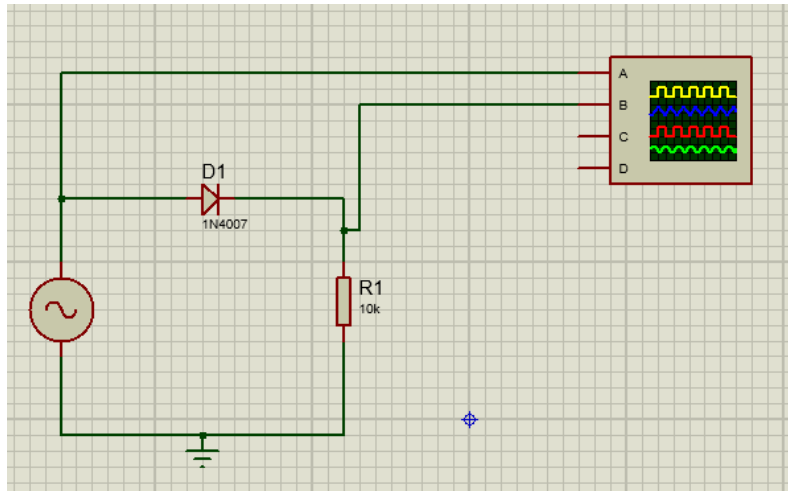
Series Clippers

In series clippers the diode is connected in series with the output load resistance. It has two types

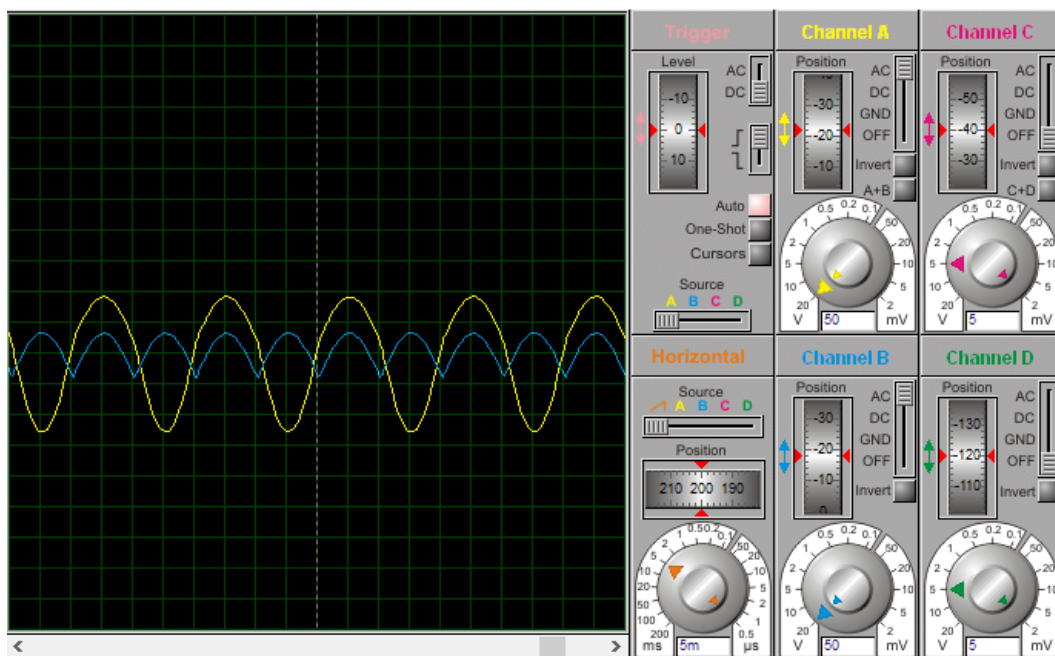
1. Positive Series Clippers

A Clipper circuit in which the diode is connected in series to the input signal and that attenuates the positive portions of the waveform, is termed as Positive Series Clipper. Thus, the voltage across the load resistor will be equal to the applied input voltage as it completely appears at the output V_0 .

Schematic Diagram:



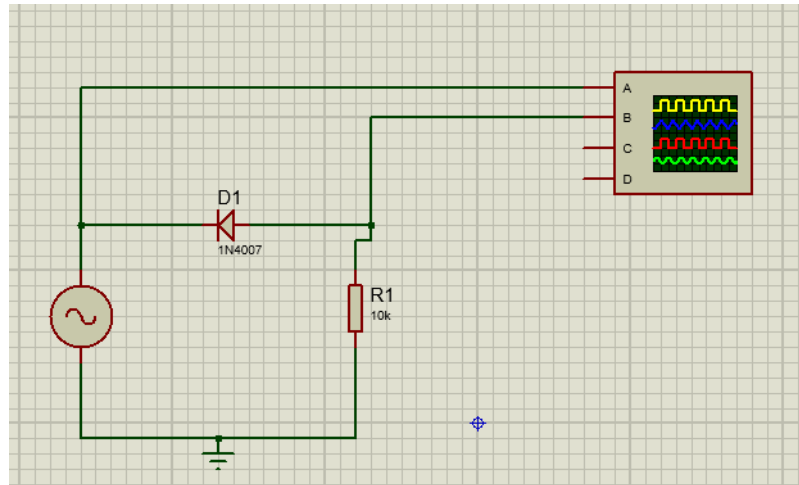
Output of Oscilloscope:



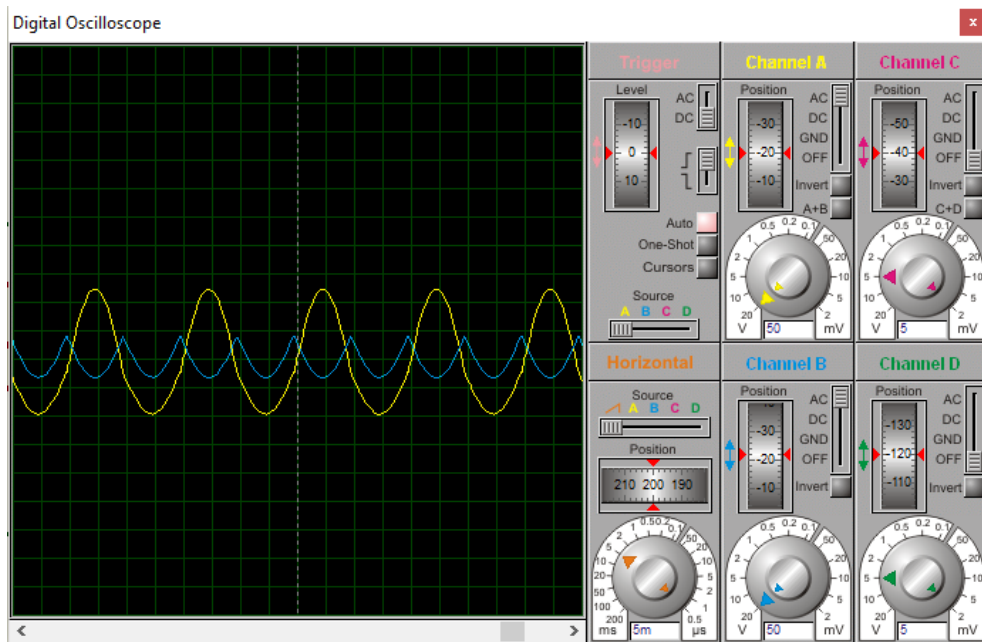
2. Negative Series Clippers:

A Clipper circuit in which the diode is connected in series to the input signal and that attenuates the negative portions of the waveform, is termed as Negative Series Clipper. This makes the diode forward biased and hence it acts like a closed switch.

Schematic Diagram:



Output of Oscilloscope:



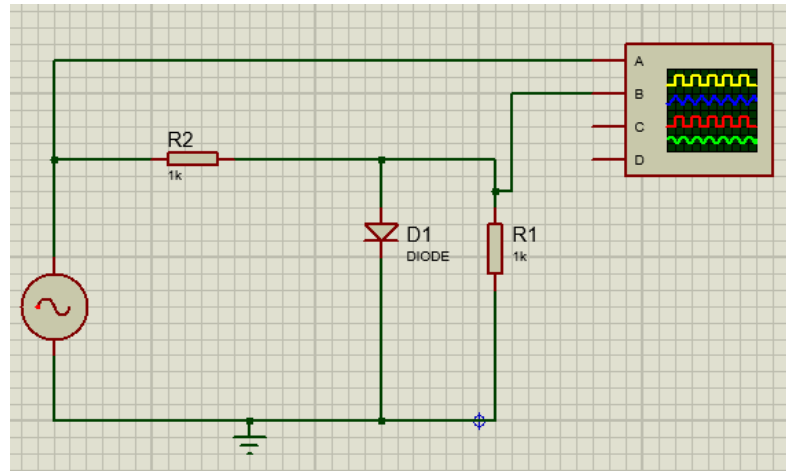
Parallel Clippers:

Clippers has a diode is connected in parallel with the output load resistance. It has two types...

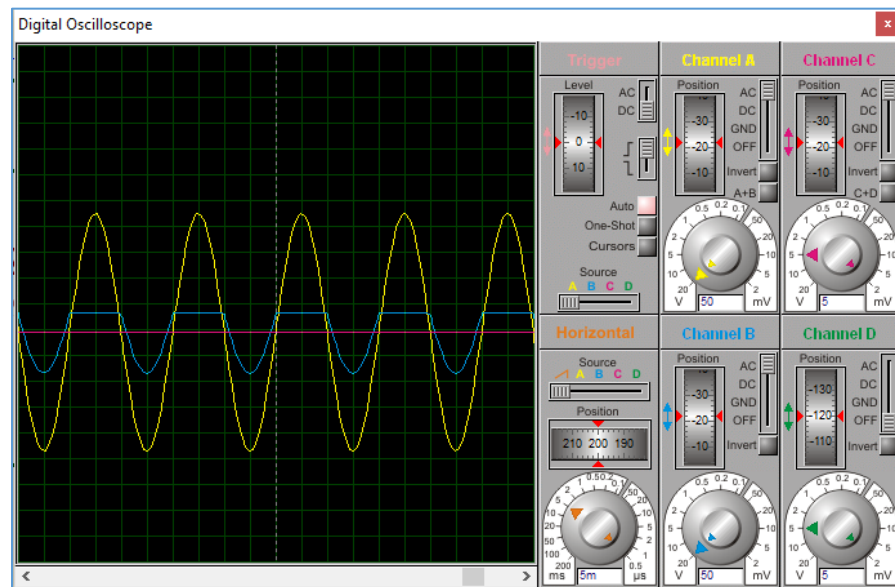
1. Positive Parallel Clippers

A Clipper circuit in which the diode is connected in parallel to the input signal and that attenuates the positive portions of the waveform, is termed as Positive Parallel Clippers.

Schematic Diagram:



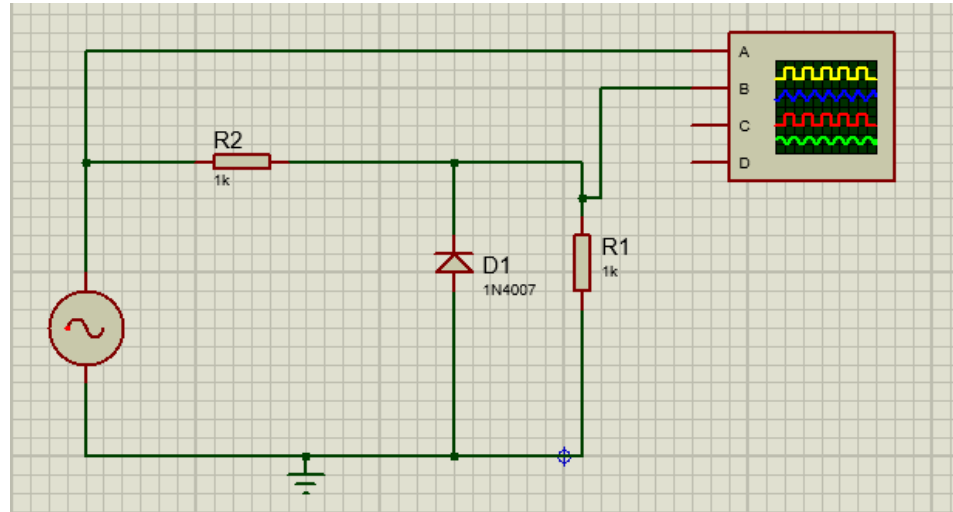
Output of Oscilloscope:



2. Negative Parallel Clippers

A Clipper circuit in which the diode is connected in parallel to the input signal and that attenuates the negative portions of the waveform, is termed as Negative Parallel Clipper.

Schematic Diagram:



Output of Oscilloscope:

