

# **DE-AMPLIFICATION AND NEGATIVE CLIPPING USING SZIKLAI TRANSISTOR**

**VENKATESAN B**

**DEPARTMENT of ELECTRONICS and COMMUNICATION  
ENGINEERING**

**Dr. MAHALINGAM COLLEGE of ENGINEERING and  
TECHNOLOGY, POLLACHI**

**E-mail id:** [venkiarathi1999@gmail.com](mailto:venkiarathi1999@gmail.com)

## **CIRCUIT DESCRIPTION:**

### **INTRODUCTION TO SZIKLAI TRANSISTOR PAIR:**

The Sziklai Transistor Pair is a special type of transistor pair obtained as a result of modification of Darlington Pair transistors in order to overcome the drawbacks in the Darlington pair transistors. The main idea here is the construction of both NPN and PNP configuration of transistors using a PNP(Q2N2907A) and NPN (Q2N2222) transistors.

### **DEMERITS OF DARLINGTON TRANSISTOR PAIR:**

1. Switching speed is low,
2. Bandwidth of operation is limited.
3. Introduction of phase shift at certain frequencies due to negative feedback.
4. The Base-Emitter Voltage required to trigger the Transistor is high.

Advantages of Sziklai Transistors:

1. The Base-Emitter Voltage required to triggering is low.
2. It provides good thermal stability.

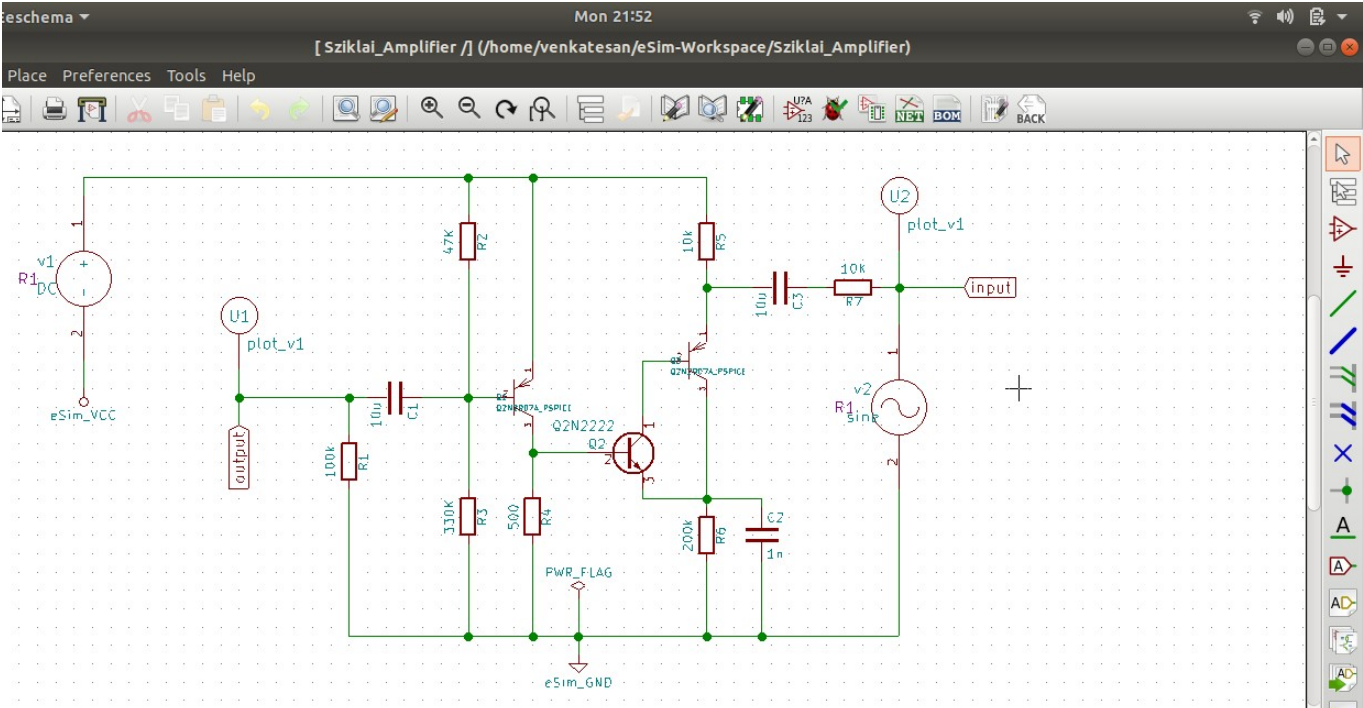
### **WORKING:**

The de-amplifier design uses potential divider biasing methodology. Biasing components are selected to obtain optimum performance of the circuit, along with PNP (Q2N2907A) and NPN (Q2N2222) transistors. The assembly of the Transistors in the circuit are adjusted in such a way that the circuit contains both NPN and PNP Sziklai Transistor pairs. The De-amplification of the signal occurs in the NPN transistor pairs as the NPN configuration is used for discharging purpose it reduces the signal strength. The resistance across the Collector terminal is adjusted with the help of the Base-Emitter voltage that is set using the biasing resistors. The PNP transistor configuration acts as a Diode connected in series with the De-amplification circuit. As a result of which the output of the NPN transistor pairs are clipped along the Negative Peaks and the Positive Peaks of the De-amplified signal are passed as output. Here again the Negative Clipping voltage is set as the threshold voltage using the biasing resistors.

### **REFERENCES:**

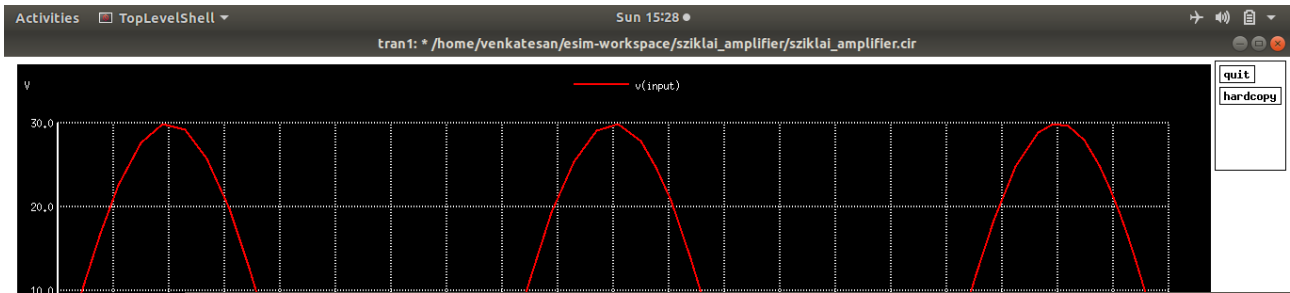
1. <https://ieeexplore.ieee.org/document/7888089?section=abstract>
2. <https://www.google.com/search?q=darlington+pair+transistors+drawbacks&oq=darlington+pair+transistors+drawbacks&aqs=chrome..69i57.26973j1j8&sourceid=chrome&ie=UTF-8>
3. <https://circuitdigest.com/electronic-circuits/sziklai-transistor-pair>

CIRCUIT DIAGRAM:

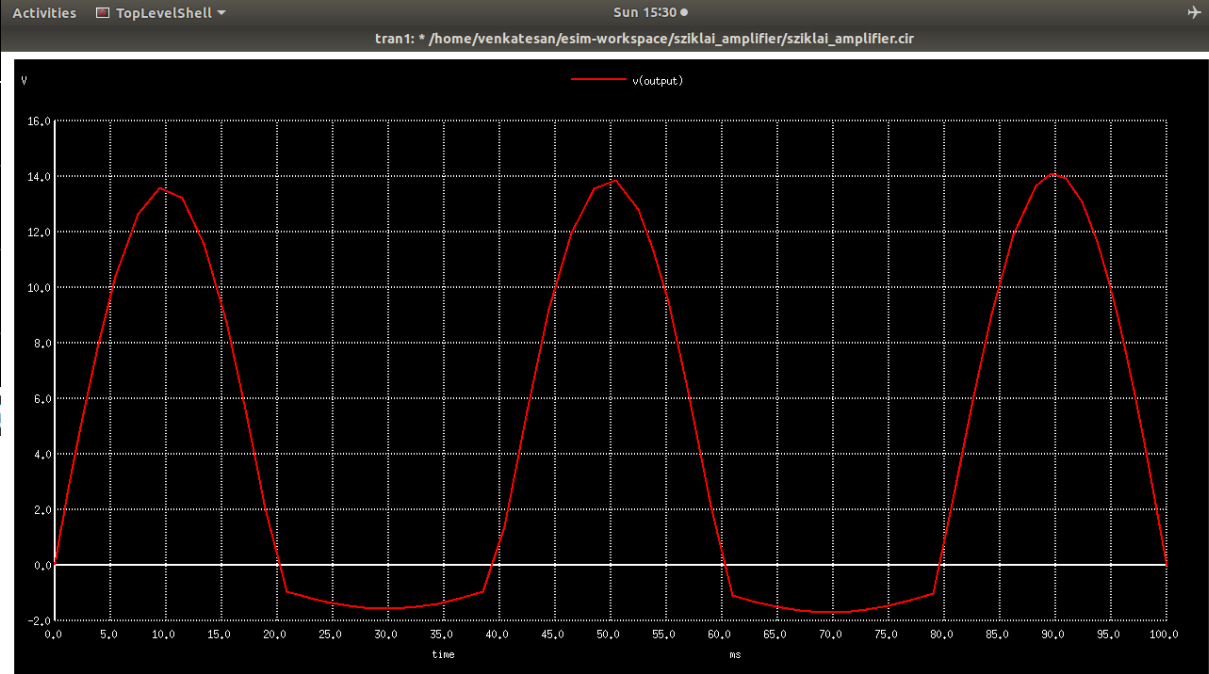


NGSPICE GRAPHS:

Input:



Output:



Python Plot:

