

DARLINGTON EMITTER FOLLOWER

OBJECTIVE

To design and construct a darlington emitter follower and to calculate the bandwidth and cutoff frequency

ABSTRACT

Darlington emitter follower is a type of electronic circuit that is used to amplify signals. It is essentially a two-stage transistor amplifier that consists of two transistors connected in a particular configuration. The Darlington configuration provides a high current gain and high input impedance, making it useful for driving loads that require a high current.

In this configuration, the base of the first transistor is connected to the input signal, while the collector of the first transistor is connected to the base of the second transistor. The output is taken from the collector of the second transistor. The emitter of both transistors is connected together and acts as the output.

INTRODUCTION

The main advantage of the Darlington emitter follower is that it provides a very high current gain, making it useful for applications where a high current output is required. Additionally, it has a low input impedance, which means it can be driven by a wide range of signal sources.

However, one potential disadvantage of the Darlington emitter follower is that it has a relatively high output impedance. This means that it may not be suitable for driving loads that require a low impedance output, such as audio amplifiers.

HARDWARE REQUIREMENT/DESCRIPTION

2 N 2222 - Transistor.

4.7 k, 47 k - Resistors.

10 u - capacitor.

CRO

function generator.

Voltage Regulator.

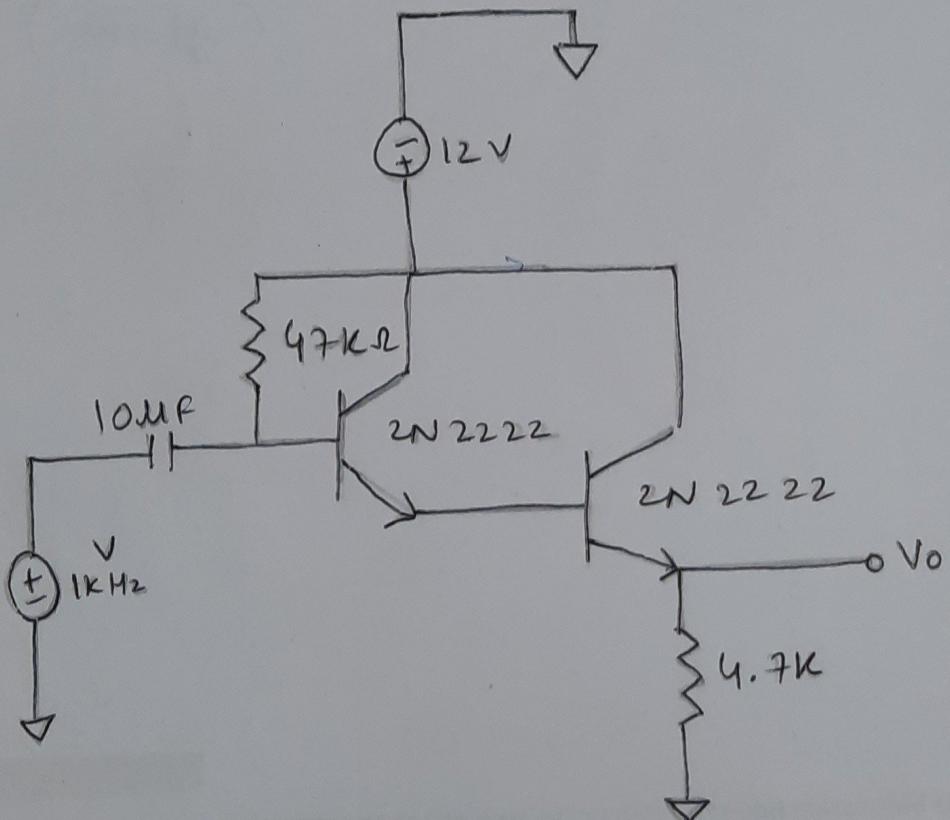
wires.

Breadboard

CIRCUIT/COMPONENT SPECIFICATIONS

Supply voltage (V_{cc})	
Supply current ($V_{cc} = +5 \text{ V}$)	
Output current (maximum)	
Power consumption (minimum operating)	
Operating temperature	

CIRCUIT DIAGRAM



DESIGN ISSUES

- Maximum supply voltage should not exceed 15V
- Humidity should not exceed 85% relative humidity.
- Timing tolerance should not exceed +10 sec for 1 min.

CALCULATIONS: (PRACTICAL / L + SPICE)

$$V_{gain} = 1.$$

$$I_{gain} = \frac{(2.298 - 2.288) \text{mA}}{2 \times 470 \text{nA}} = \frac{0.0096 \times 10^{-3}}{960 \times 10^{-9}} = 10$$

SIMUALTIONS RESULTS/OUTPUTS:

(next Pg.)

CONCLUSIONS

Hence designed and constructed the darlington Amplifier and calculated the band width and cut-off frequency

REFERENCES

→ electogeek Z.

Uispice XVII - Draft4

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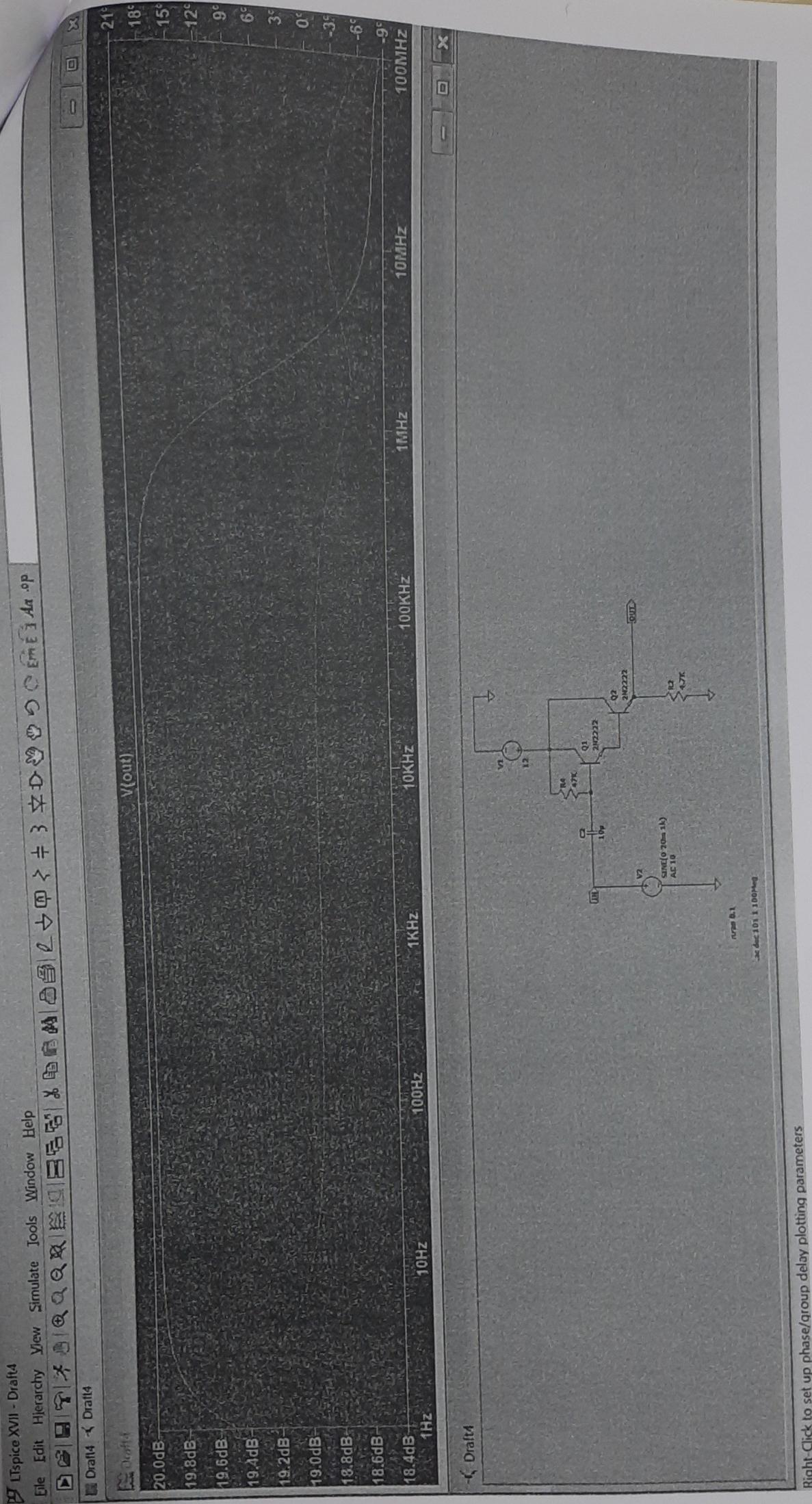


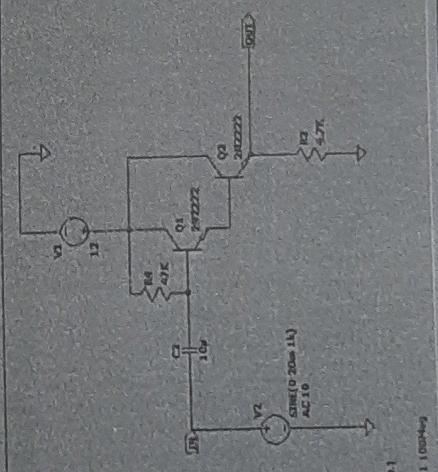
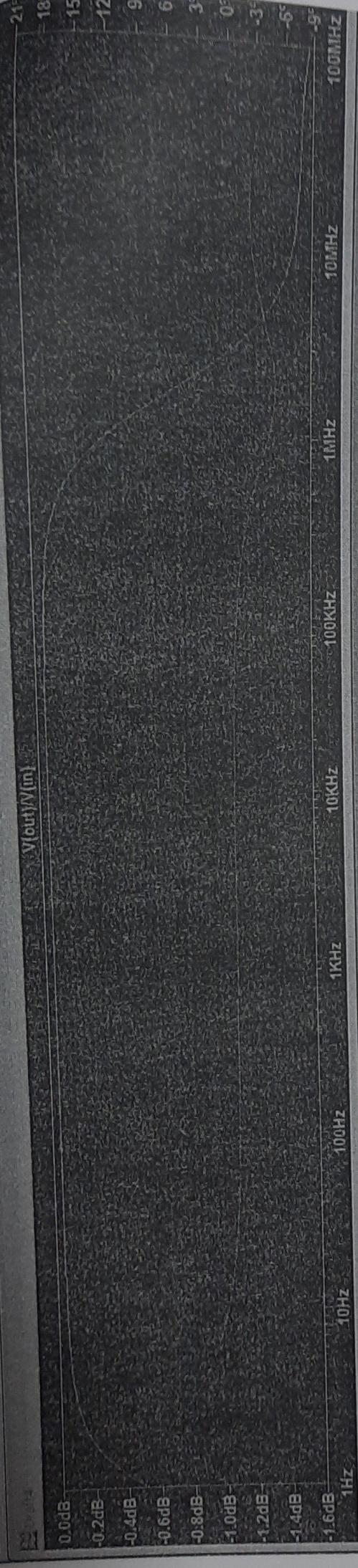






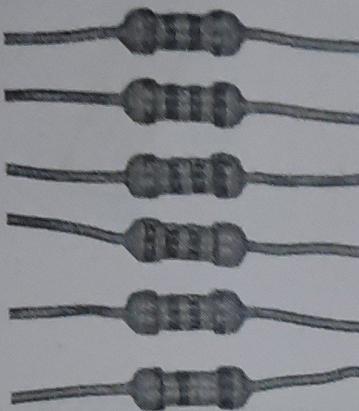






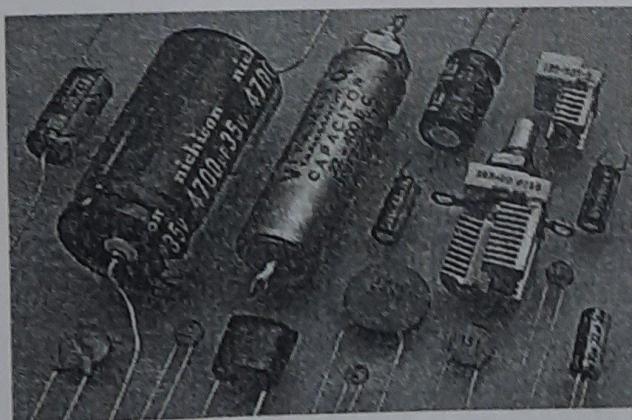
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Resistor



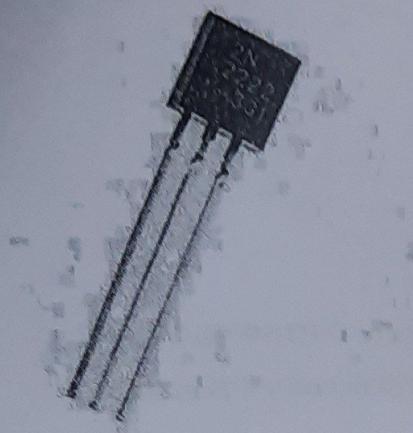
A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses.

Capacitor



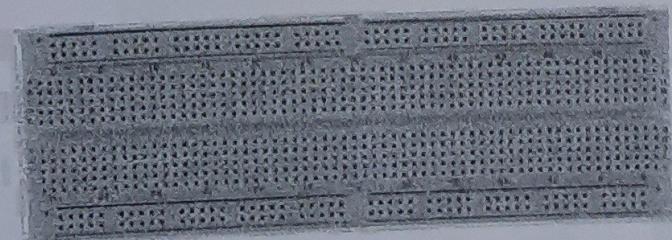
A capacitor is a device that stores electrical energy in an electric field by virtue of accumulating electric charges on two close surfaces insulated from each other. It is a passive electronic component with two terminals.

2N2222 TRANSISTOR



The 2N2222 is a common NPN bipolar junction transistor (BJT) used for general purpose low-power amplifying or switching applications. It is designed for low to medium current, low power, medium voltage, and can operate at moderately high speeds.

Breadboard



A **breadboard**, **solderless breadboard**, or **protoboard** is a construction base used to build semi-permanent prototypes of electronic circuits. Unlike a perfboard or stripboard, breadboards do not require soldering or destruction of tracks and are hence reusable.