

      KHULNA UNIVERSITY OF ENGINEERING AND TECHNOLOGY

**ELECTRONICS AND COMMUNICATION ENGINEERING**

Report on: Power Amplifier

Course No.: ECE-2200

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Date of Submission : 29 December,2022

**Title**:

A power amplifier amplifying the input signal across 8ohm load at output.

**Motivation:**

A power amplifier has been used in almost every electronics devices where we can get a greater output for a small or a feeble input signal. In this regard this project will help to enrich our knowledge on amplifier ICs and their working principle.

**Objective:**

* To raise the power level of input signal (Audio Signal).

**Introduction:**

A power amplifier is an electronic amplifier designed to increase the magnitude of power of a given input signal. The power of the input signal is increased to a level high enough to drive loads of output devices like speakers, headphones, RF transmitters etc. Unlike voltage/current amplifiers, a power amplifier is designed to drive loads directly and is used as a final block in an amplifier chain. Power amplifiers are used for increasing the magnitude of power of a weaker audio Signal. The amplifiers used in speaker driving circuitries of televisions, mobile phones etc. come under this category. The output of an audio power amplifier ranges from a few milliwatts (like in headphone amplifiers) to thousands of watts (like power amplifiers in Hi-Fi/Home theatre systems). Power amplifiers are the most important component of any audio system. They amplify the low-level signals and convert them into a high-level analog signal that can be amplified further. To amplify a power amplifier, you need to know the gain of your particular amplifier. The purpose of a power amplifier is mainly to boost the radio signal to sufficient power levels suitable for a wired or wireless transmission from the transmitter to the receiver. Typically, they work at relatively high-power levels and hence are a major power consumer in the overall transmitter system.

**Theory:**

The power supply takes the large AC signal from a household wall socket and reduces and rectifies it to the +/- 12 Volt DC signals required to operate the circuit. We here not designed the rectifier circuit as we have DC power supply in our Circuit Designing Laboratory. The prototype used a pre-built bridge rectifier for space considerations and cost effectiveness, but assembly out of individual components is an alternative. By taking the center tap of the transformer as ground, the rectified output sweeps of the bridge rectifier nodes are defined as +15 and –15 Volt peak half- 1 Fully rectified meaning that there is a signal output for both the positive and negative input sweeps 4 waves. The waves are then smoothed out by placing large (1 uF) capacitors between the positive/negative outputs and ground. The capacitors charge during the output peaks and discharge when the waves are low. This smoothies the signal into almost DC with some ripple. It is important to note that interference and feedback in the power supply was a significant problem once the entire circuit was connected. This problem was alleviated by connecting large capacitors from the positive and negative nodes to ground at multiple sites of the circuitry. The large capacitors act as shorts to AC signals only, and so any distortions propagating in the supply lines are grounded through them.