Abu Dhabi University

EEN 360 - Electronic Devices and Circuits II

Lab Report 3
Output Stages Amplifiers

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Section 1

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Abstract

There are various classes of amplifiers, and each and every class has its own characteristics and properties. Class A has less efficiency, at 25

1 Introduction

There are many classes in power amplifiers which can be used as output stages to finally process the signal before sending it into the medium/channel.[1] These amplifiers can be of many types. The efficiency of these classes increases as we shift from class A to C. The basic problem is of distortion which the each transistor is conducting at cycles.[3] This makes us understand that the transistors will be on only at specific time. The time is actually the voltage needed to switch on the transistor. The answer to the problem is that to decrease the dead zone by a small current.[2]

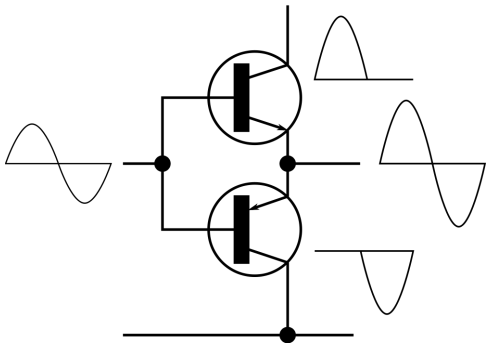


Figure 1: Class AB. Each transistor conducts for half the cycle. Figures taken from Wikipedia.org.

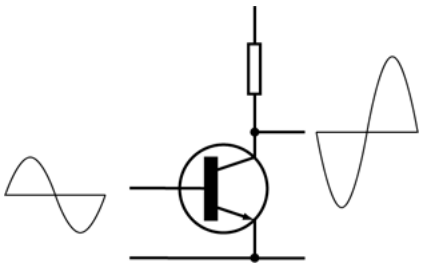


Figure 2: Class A. The transistor conducts for the whole cycle. Figures taken from Wikipedia.org.

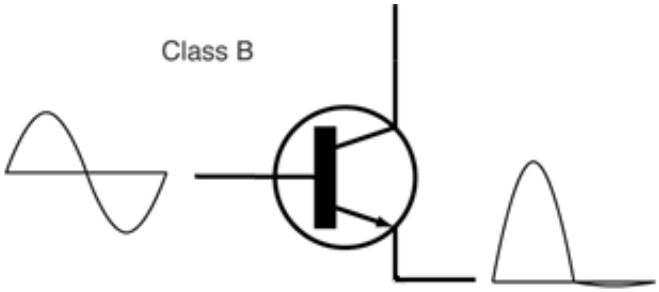


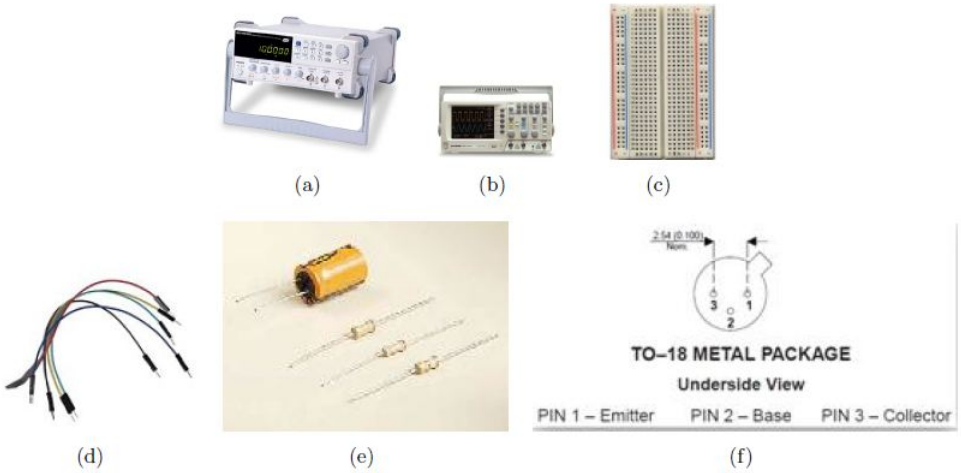
Figure 3: Class B. The transistor conducts for half the cycle. Figures taken from Wikipedia.org.

2 Experiment Set-up

Compare the theory and the hardware of the procedure of a class B applier. The power amplifier is planning to relocate the utmost power to the output with no deformation. In 1st exercise we will see the deformation that since the two transistors is not ideal and there is 0.7 volts deformation so we are going to attach to diode to get rid of the deformation.

3 List of Equipment used

- Function Generator.
- Oscilloscope.
- ETS 5000.
- Breadboard.
- Cables.
- Resistors.
- Silicon diode 2N4001.
- BJT NPN transistor.
- BJT PNP transistor.



(a) (b) (c) (d) (e) (f)

Figure 1: List of equipment

4 Procedure

4.1 Part 1

- Input 2V peak to peak sinusoidal wave is sent as input.
- Connect the input with both the transistors
- Connect 10V to NPN and also PNP
- Connect the emitter togather along with 1K Ω

4.2 Part 2

- Connect the diodes as shown.
- Connect the p junction of the diode with the N junction to the base
- Connect the p junction of the diode with the p junction to the base
- As shown in the picture

5 Results and Discussion

5.1 Answers

1 Yes.

2 0.7V and -0.7V

3 Yes.

4 9V.

5.2 Circuit Pictures and results

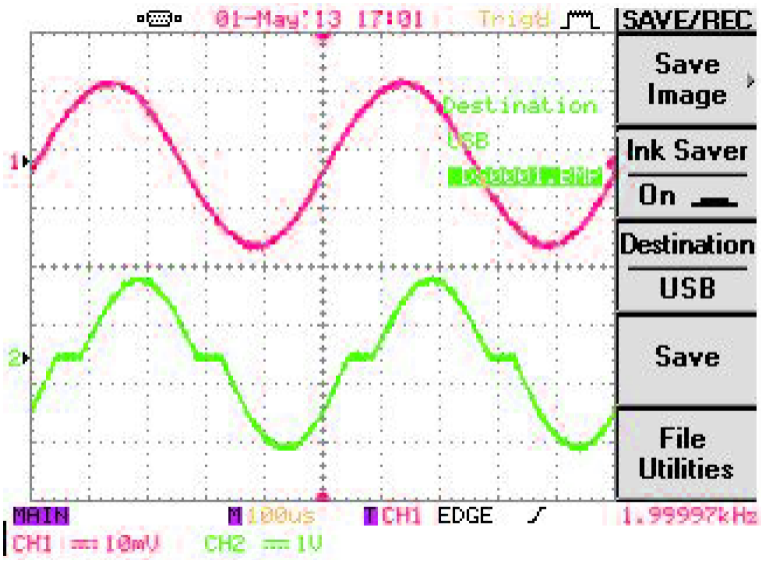


Figure 4: The pink signal is the original signal and the green signal is the amplifies output. The Class AB has a problem here which is distortion or zero output voltage when the voltage is in the range -0.7 to +0.7. In this range the transistors are not biased for active mode this is the reason the distortion happens.

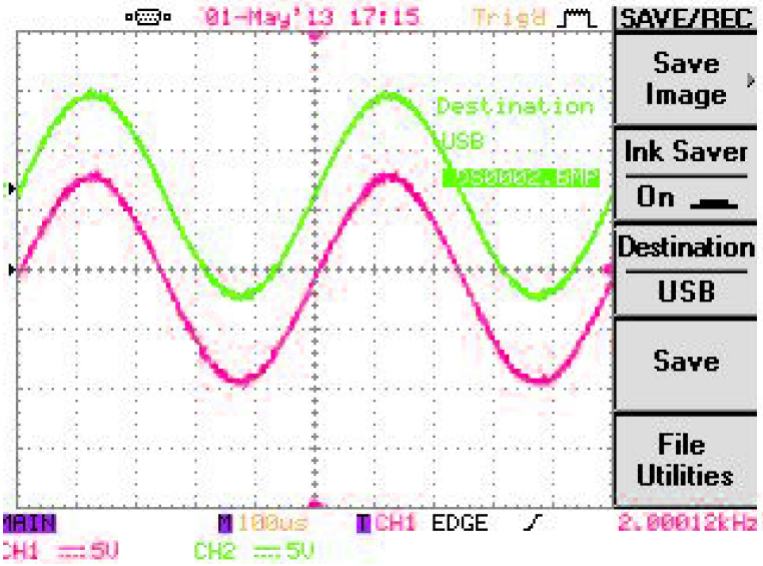


Figure 5: The pink signal is the original signal and the green signal is the amplifies output. The Class AB has solved the problem of distortion because the transistors are biased by some voltage. When the input signal is small, the voltage provided to the transistors are still biased to amplify this voltage.

6 Conclusion

In conclusion the power appliers used to create big current at output and remain the voltage similar as input an voltage which means the output power is better than input power while in the voltages appliers amplifying the voltages .as well there are a few kinds of power appliers such as Class A, B, and AB. Class B has more ancient than Class A other than it has some deformation. In this case used appliers that ordinary flanked by A and B which called 'Class AB' that get rid of deformation in the class B. We noticed so as to the genuine world is not an perfect world.

Emitter follower circuit has best power transfer efficiency, as its output impedance is very low and input impedance is quite high making it absorb more juice from the supply and delivering maximum power to load without loss. Class A has minimal distortion than Class B and AB while the power efficiency is quite low than the other classes such as Class B and AB.

7 Team Dynamics

Part and Member	**Weight Grade**	**Muhammad Obaidullah**	**Bilal Arshad**
Abstract	10%	50%	50%
Introduction	15%	50%	50%
Procedure Part 1	15%	50%	50%
Procedure Part 2	15%	50%	50%
Results Part 1	15%	50%	50%
Results Part 2	15%	50%	50%
Conclusion	15%	50%	50%
Total	100%	50%	50%

References

[1] Output Stages. *9 Introduction to Microelectronics*. [Electronic]. Available: `http://www.seas.upenn.edu/~ese319/Lecture_Notes/Lec_20_PowerAmps1_10.pdf` [7 June 2013].

[2] Differential Amplifier. *http://www.ece.mtu.edu/faculty/goel/EE-4232/Output-Stages.pdf* [Electronic]. Page 1. Available: `http://www.ece.mtu.edu/faculty/goel/EE-4232/Output-Stages.pdf` [7 June 2013].

[3] Jim Williams *Power Gain Stages for Monolithic Amplifiers* Linear Technology. [Electronic]. Available: `http://cds.linear.com/docs/en/application-note/an18f.pdf` March 1986[4 June 2013].