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NAAC Accredited Autonomous Institution
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Thalavapalayam, Karur – 639 113.



A Minor Project Report

On

MINI STEREO POWER AMPLIFIER

Submitted in partial fulfilment of requirements for the award of the

Degree of

BACHELOR OF ENGINEERING

in

ELECTRONICS AND COMMUNICATION ENGINEERING

Under the guidance of

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M.KUMARASAMY COLLEGE OF ENGINEERING, KARUR

BONAFIDE CERTIFICATE

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Examination held at M.Kumarasamy College of Engineering, Karur on_____

Vision and Mission of the Institute and Department

Vision

To emerge as a leader among the top institutions in the field of technical education.

Mission

- ❖ Produce smart technocrats with empirical knowledge who can surmount the global challenges.
- ❖ Create a diverse, fully-engaged, learner-centric campus environment to provide quality education to the students.
- ❖ Maintain mutually beneficial partnerships with our alumni, industry and professional associations.

Department of Electronics and Communication Engineering

Vision

To empower the Electronics and Communication Engineering students with emerging technologies, professionalism, innovative research and social responsibility.

Mission

- ❖ Attain the academic excellence through innovative teaching learning process, research areas & laboratories and Consultancy projects.
- ❖ Inculcate the students in problem solving and lifelong learning ability.
- ❖ Provide entrepreneurial skills and leadership qualities.
- ❖ Render the technical knowledge and skills of faculty members.

PROGRAM EDUCATIONAL OBJECTIVES (PEO'S)

- ❖ **PEO1:** Graduates will have a successful career in academia or industry associated with electronics and communication engineering.
- ❖ **PEO2:** Graduates will provide feasible solutions for the challenging problems through comprehensive research and innovation in the allied areas of electronics and communication engineering.
- ❖ **PEO3:** Graduates will contribute to the social needs through lifelong learning, practicing professional ethics and leadership quality

PROGRAM OUTCOMES(PO'S)

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PROGRAM OUTCOMES(PO'S)

- ❖ **PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
- ❖ **PO2: Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
- ❖ **PO3: Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
- ❖ **PO4: Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
- ❖ **PO5: Modern tool usage:** Create, select, and apply appropriate techniques, resources, and

modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

- ❖ **PO6: The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- ❖ **PO7: Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
- ❖ **PO8: Ethics :** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
- ❖ **PO9: Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
- ❖ **PO10: Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
- ❖ **PO11: Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader
- ❖ **PO12: Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSO'S)

- ❖ **PSO1:** Applying knowledge in various areas, like Electronics, Communications, Signal processing, VLSI, Embedded systems etc., in the design and implementation of Engineering application.
- ❖ **PSO2:** Able to solve complex problems in Electronics and Communication Engineering with analytical and managerial skills either independently or in team using latest hardware and software tools to fulfil the industrial expectations in a team, to manage projects and in multidisciplinary environment

Abstract	Matching with PO's, PSO's
Keywords	PO1, PO3, PO9, PSO1

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ABSTRACT

The reason for building the amplifier as a stereo amplifier is that the totally balanced audio topology renders the amplifier insensitive to power supply noise. There is therefore no need to have separate left and right power supplies, and a considerable reduction in support circuit can be achieved. Last but not least, the author had many of the parts to achieve a stereo amplifier, but a pair of mono chassis would have doubled the metalwork and required the purchase of two large HT chokes. You might have a different opinion about the benefits of a stereo chassis.

Keywords: Mini Amplifier.

INTRODUCTION

Stereo amplifiers are one of the most popular ways of improving the sound quality in different situations and conditions. They can be used at home or office and they can amplify the signal coming from CD and DVD players, TVs, etc. Stereo amplifiers have the same working principle as those old amps and we will explain it here thoroughly.

Stereo amplifiers have 3 ports/connectors (input port for connecting the signal source, the output port that's used to send the signal to the speakers and power source connector or power input). These amplifiers receive power from the wall socket and they convert alternating current to the direct current thanks to the device called transistor. That device is some kind of valve that enables the current to flow in specific amounts. The amount of current that the transistor allows to flow depends on the signal received from the signal source (TV, PC, player, etc.). Smaller signals will enable less current to flow and the amplification will be smaller than the amplification of larger signals that enable more current to flow.

LITERATURE SURVEY

In this study, various design techniques of CMOS power amplifiers are analyzed. For several highly integrated wireless Silicon CMOS transmitters and transceivers with many different configurations, the Power amplifier (PA) is a significant building block. For tight integration with other wireless building blocks, CMOS power amplifiers (PAs) can be built. The various design techniques are compared with respect to parameters like output power, technology used, gain obtained frequency of operation, PAE (power added efficiency) and number of transistors and transformers used etc. The obtained parameters are then compared using a table and various parameters of different designs are plotted graphically for comparison. These comparison results would provide any designer with hands on data to select the best possible design of a CMOS amplifier suitable for the required application.

METHODOLOGY

In this part, you will develop a design methodology for the TIA given gain-bandwidth constraints, with the goal of minimizing power. To prove that your design methodology is flexible with input specifications, you will need to submit two instances of your TIA targeting the following two sets of specifications. Note that the phase margin specification is only applicable if you use a feedback-based topology. (Please note) that if you use a process technology other than the 45nm GPDK, this particular set of specifications may or may not be feasible. Especially if you are using a substantially different process, please consult with the teaching staff early on about what an appropriate set of specs to target would be.

TOOLS USED

HARDWARE REQUIREMENT:

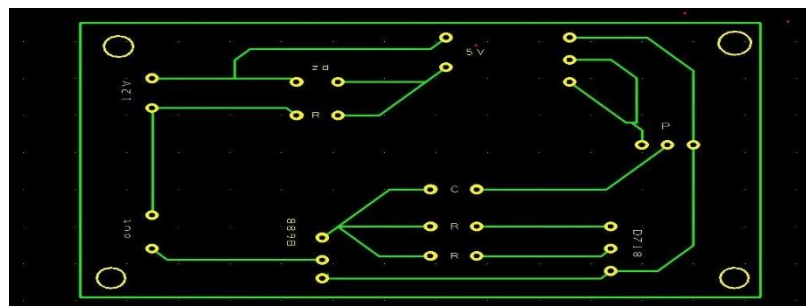
- Resistor,
- Capacitor,
- Transistor 2N3055,
- Variable resistor,
- Speaker,
- LED,
- Power switch,
- 12 Volt DC supply,
- Bluetooth module.

POWER SUPPLY

The most common source of power for audio power amplifier is the unregulated powersupply for its simplicity, good performance, and reasonable cost. The basic parts of an unregulated power supply are the transformer, diodes, and capacitors. The main draw back of an unregulated power supply is voltage fluctuations with load and power mainsfluctuations. The power supply project presented here have current limitations, 24V DC -12V DC, but the theory of operation is the same as any higher voltage or current power supplies. The AC line votage goes into the primary of the power transformer through a fuse anda switch. The AC is then transferred to the secondary winding by magnetic inductionto whatever voltage your audio amplifier requires. The AC in the secondary winding isconverted by Br1, a bridge rectifier, to a pulsating direct current. C1, 2, 3 and 4 are large value filter or reservoir electrolytic capacitors that smoothes out the low frequency fluctuations coming from the bridge rectifier. The voltage across these capacitors is now DC with a few millivolts of ripple on each rail. C5 and C6 are film capacitors that reduce rail high frequency noise. R1, L1, R2 and L2 are power ON indicators and may be omitted if you prefer.

Increasing the capacitance value of the filter/reservoir capacitors reduces the ripple in the power supply's DC rails. It would also improve the low frequency response of the power amplifier and in my opinion, will be a much cleaner, heftier and meanersounding audio amplifier.

Figure.no:1.1



SKETCH OF STEREO AMPLIFIER

An amplifier takes an input signal from a source, such as a laptop, aux mode player, Bluetooth, mic, and creates a larger copy of the original signal before it's sent to the speakers. It gets the power to do this from your mains electricity, which is sent directly to the power supply within the amplifier.

Audio amplifier is the basic circuit configuration that is required to amplify, the audio signal received through a device like a microphone or the audio signal that is to be transmitted out through a speaker/ Radio device/Wireless transmitter etc.

In early stages, in the year around 1912 vacuum tubes were used for audio amplification but at around 1970s it was replaced by BJT and MOSFET. Class D power amplifiers (which use transistors/MOSFETs) are the most widely in audio amplification. Class AB power amplifiers can also be used but Class D is more preferred because of its light weight and low heat dissipation characteristics.

A basic power amplifier that is designed to take input as the low strength audio signal and generate the output signal that consists of the high strength value. This process of amplification is utilized in the various domains where an electrical signal is converted to an acoustic signal. This type of amplifiers is known as audio amplifiers. Any circuit which processes the audio signal has the audio amplifier both at the input and also at the output. For example, if a microphone receives a sound wave input signal it needs a pre-amplification of the signal before processing it further and similar before sending an electrical signal to a speaker it needs to be amplified.

EXPERIMENT PROCESS

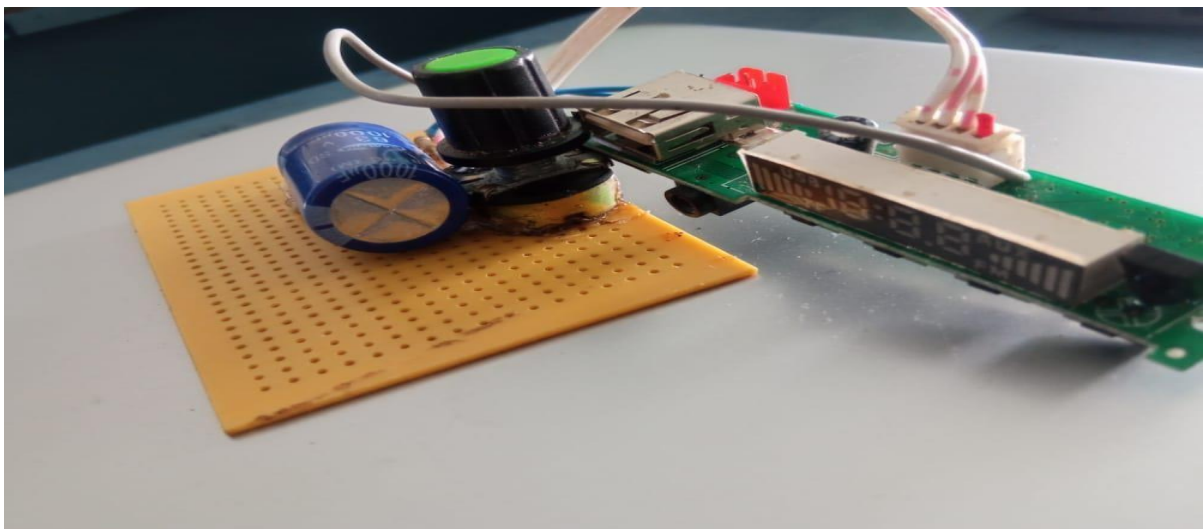
TABLE 1 RECOMMENDED COMPONENT VALUES
FOR AC COUPLING IN-AMP INPUTS

-3-dB low frequency roll-off (Hz)	RC-coupling components		Input-bias current I_B (nA)	V_{OS} (ΔV_{CM}) at each input	V_{OS} error for 2% R_1 , R_2 mismatch, assuming $I_{B1}=I_{B2}$ (μA)
	C_1 , C_2 (μF)	R_1 , R_2 (Ω)			
2	0.1	1M	2	2 mV	40
2	0.1	1M	10	10 mV	200
30	0.047	115k	2	230 μV	5
30	0.1	53.6k	10	536 μV	11
100	0.01	162k	2	324 μV	7
100	0.01	162k	10	1.6 mV	32
500	0.002	162k	2	324 μV	7
500	0.002	162k	10	1.6 mV	32

Table no:1.1

Figure no:1.2

MAKING PROCESS OF STEEO AMPLIFIER



FEATURES.

- Output power.
- Distortion.
- Gain.
- Frequency response.
- Impedance.
- Sensitivity.
- Signal-to-noise ratio.
- Crosstalk.

APPLICATIONS

- ❖ It is used to amplify the audio signals (speaker).
- ❖ It is used as a voltage and current regulator.
- ❖ It is used as an analogue to digital converter & vice versa.
- ❖ It is used as a servo amplifier in motor.
- ❖ The output signal from the amplifier is supplied to a relay in a circuit.
- ❖ There are various usages of audio amplifiers.
- ❖ Some of them are listed as follows: In the sound systems, these amplifiers are most widely used.
- ❖ In various instruments that relate to music, these amplifiers are installed.
- ❖ In the radio signals broadcasting these amplifiers are used.
- ❖ The signal transmission for long-distance communication is the most amplifiers that are utilized.
- ❖ For the wireless transmission of the signals, audio amplification is required.

RESULT AND DISCUSSION

An amplifier, electronic amplifier or (informally) amp is an electronic device that can increase the magnitude of a signal (a time-varying voltage or current). It may increase the power significantly, or its main effect may be to boost the voltage or current (power, voltage or current amplifier).

In our mini stereo power amplifier the output voltage of 4v (4ohm) , it gives clear audio output no more noises are produce, its efficiency is high.

CONCLUSION

- The stereo amp is produced the output become high in ours mini stereo poweramplifier is contains high amplification.
- We have shown that, the body absorbs a mini stereo amp is easy to carry awayfrom minimum space like hand pockets.

REFERENCE

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- ❖ Guia de aplicacion para amplificadores. Retrieved from <http://www.Crownaudio.com/media/pdf/135045.pdf> exas Instruments. (2014).Arbona J. Pure path Smart Amp Overview.
- ❖ Application.report.Retrievedfrom<http://www.ti.com/lit/an/slaa625c/slaa625c.pdf> Zorzano, A.M. (2010). Amplificador de audio de alta fidelidad para sistemas activos de altavoces con bajo consumo de energía (Doctoral dissertation).