

RECTIFIERS

1. Pre-Lab Work

1) Using Proteus, design and simulate:

- (a) Half-wave rectifier circuit without filter capacitor (See Figure 4)
- (b) Half-wave rectifier circuit with a filter capacitor (See Figure 5)
- (c) Bridge rectifier circuit without filter capacitor (See Figure 6)
- (d) Bridge rectifier circuit with a filter capacitor (See Figure 7).

Properties:

Input signal: $V_{in}(t) = V_p \cdot \sin(100\pi t)$. RMS voltage of the input: $V_{RMS} = 9V$.

Diode: 1N4001, R: 1k Ω , C: 220 μF

Then calculate;

- The average voltage V_{avg} (DC) for **(a) and (c)**,
- The RMS voltage (V_{RMS}) of the output voltages $V_{out}(t)$ for **(a) and (c)**.

To measure output voltage, use analogue graph and observe 3 or 4 periods of the output signal. Use "VSINE" component for input voltage source. (Component mode > Pick devices > Vsine)

Hint:

Average value of a periodic signal:

$$V_{DC} = \frac{1}{T} \int_0^T V(t) \cdot dt$$

RMS value of a periodic signal:

$$V_{RMS} = \sqrt{\frac{1}{T} \int_0^T V(t)^2 \cdot dt}$$

where T is the period of the signal.

Lab Manual For Rectifiers With Filter

Harry Alex Romanowitz



Lab Manual For Rectifiers With Filter:

Laboratory Manual for Introductory Electronics Experiments L. K. Maheshwari, M. M. S. Anand, 1979 **Lab Manual for Electronics** Martin Feldman, 2001-11 The emphasis is first on understanding the characteristics of basic circuits including resistors capacitors diodes and bipolar and field effect transistors The readers then use this understanding to construct more complex circuits such as power supplies differential amplifiers tuned circuit amplifiers a transistor curve tracer and a digital voltmeter In addition readers are exposed to special topics of current interest such as the propagation and detection of signals through fiber optics the use of Van der Pauw patterns for precise linewidth measurements and high gain amplifiers based on active loads KEY TOPICS Chapter topics include Thevenin's Theorem Resistive Voltage Division Silicon Diodes Resistor Capacitor Circuits Half Wave Rectifiers DC Power Supplies Diode Applications Bipolar Transistors Field Effect Transistors Characterization of Op Amp Circuits Transistor Curve Tracer Introduction to PSPICE and AC Voltage Dividers Characterization and Design of Emitter and Source Followers Characterization and Design of an AC Variable Gain Amplifier Design of Test Circuits for BJT's and FET's and Design of FET Ring Oscillators Design and Characterization of Emitter Coupled Transistor Pairs Tuned Amplifier and Oscillator Design of AM Radio Frequency Transmitter and Receiver Design of Oscillators Using Op Amps Current Mirrors and Active Loads Sheet Resistance Design of Analog Fiber Optic Transmission System Digital Voltmeter **Laboratory Manual for Microelectronic Circuits** Kenneth C. Smith, Adel S. Sedra, 1991 This manual contains approximately 35 experiments It follows the organization of the text and includes experiments for all major topics To help instructor's choose and prepare for the experiments this manual identifies the core experiments all students should perform and includes manufacturers data sheets for the most common components

Laboratory Manual to Accompany the Textbook Fundamentals of Semiconductor and Tube Electronics Harry Alex Romanowitz, 1962 Electronics Laboratory Manual Ralph Ross Wright, 1945 **EP363/P360 Course Notes and Laboratory Manual** Raphael Littauer, 1985 **Basic Electronics Engineering** Satya Sai Srikant, Prakash Kumar Chaturvedi, 2020-04-27 This book is primarily designed to serve as a textbook for undergraduate students of electrical electronics and computer engineering but can also be used for primer courses across other disciplines of engineering and related sciences The book covers all the basic aspects of electronics engineering from electronic materials to devices and then to basic electronic circuits The book can be used for freshman first year and sophomore second year courses in undergraduate engineering It can also be used as a supplement or primer for more advanced courses in electronic circuit design The book uses a simple narrative style thus simplifying both classroom use and self study Numerical values of dimensions of the devices as well as of data in figures and graphs have been provided to give a real world feel to the device parameters It includes a large number of numerical problems and solved examples to enable students to practice A laboratory manual is included as a supplement with the textbook material for practicals related to the coursework The

contents of this book will be useful also for students and enthusiasts interested in learning about basic electronics without the benefit of formal coursework

Power Electronics Handbook Muhammad H. Rashid, 2010-07-19 Power electronics which is a rapidly growing area in terms of research and applications uses modern electronics technology to convert electric power from one form to another such as ac dc dc dc dc ac and ac ac with a variable output magnitude and frequency Power electronics has many applications in our every day life such as air conditioners electric cars sub way trains motor drives renewable energy sources and power supplies for computers This book covers all aspects of switching devices converter circuit topologies control techniques analytical methods and some examples of their applications 25% new content Reorganized and revised into 8 sections comprising 43 chapters Coverage of numerous applications including uninterruptable power supplies and automotive electrical systems New content in power generation and distribution including solar power fuel cells wind turbines and flexible transmission

Laboratory Manual for Fundamentals of Radio ... C. W. Caldwell, 1942

Laboratory Manual for Use with Electricity and Electronics Dale R. Patrick, William Dugger, 1996

Catalog of Technical Reports United States. Dept. of Commerce. Office of Technical Services, **Silicon Controlled Rectifier Manual** General Electric Company, 1967

Electricity-electronics Fundamentals Paul B. Zbar, Joseph G. Sloop, 1977

Handbook of Semiconductor Electronics Lloyd P. Hunter, 1962

Elektronischer Bauteil Halbleiter

Technical Report - Laboratory for Insulation Research Massachusetts Institute of Technology. Laboratory for Insulation Research, 1962

Basic Electronics Paul B. Zbar, 1976

Community College of the Air Force General Catalog Community College of the Air Force (U.S.), 1979

Basic Television and Television-receiver Servicing Paul B. Zbar, Sidney Schildkraut, 1958

Rectenna: Wireless Energy Harvesting System Binod Kumar Kanaujia, Neeta Singh, Sachin Kumar, 2021-05-22 This book covers the theory modeling and implementation of different RF energy harvesting systems RF energy harvesting is the best choice among the existing renewable energy sources in terms of availability cost size and integration with other systems The device used for harvesting RF energy is called rectenna A rectenna can work at the microwave millimeter wave and terahertz waves It also has the capability to operate at optical frequencies to be used for 6G and beyond communication systems This book covers all aspects of wireless power transfer WPT wireless energy harvesting WEH basics theoretical concepts and advanced developments occurring in the field of energy harvesting It also covers the design theory for different types of antenna rectifier and impedance matching circuits used in RF energy harvesting systems Different future and present applications such as charging of vehicles smart medical health care self driven e vehicles self sustainable home automation system and wireless drones have also been discussed in detail

Fundamentals of Analog Circuits Thomas L. Floyd, David Buchla, 1999 Fundamentals of Analog Circuits offers comprehensive coverage of a wide relevant array of topics It integrates theory practical circuits and troubleshooting concepts keeping mathematical details to a minimum Delving more deeply into coverage of linear integrated circuits than

discrete device circuits the text guides readers through a system of pedagogical tools that both reinforces and challenges their understanding Opens coverage with a five chapter introduction to discrete devices that include diodes and transistor circuits plus other topics often omitted in beginning devices texts such as RF amplifiers transmission lines transformer coupled amplifiers direct coupled amplifiers and power amplifiers Discusses the operational amplifier with separate chapters on active filters and oscillators Explores current topics of importance including instrumentation amplifiers isolation amplifiers operational transconductance amplifiers OTA phase locked loops A D and D A converters transducers and more Indicates current by meters not arrows allowing for easy integration into the curriculum of schools using either conventional current flow or electron flow Features

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