UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Sekolah Pendidikan
Profesional dan
Pendidikan Berterusan
(SPACE)

JABATAN KEJURTERAAN ELEKTRIK
PUSAT PENGAJIAN DIPLOMA (PPD), SPACE
UNIVERSITI TEKNOLOGI MALAYSIA
KUALA LUMPUR

ELECTRICAL ENGINEERING LABORATORY 2

(DDWE 2701)

ELECTRONICS 1

EXPERIMENT 1

RECTIFIER AND CLIPPING CIRCUITS

TITLE : RECTIFIER AND CLIPPING CIRCUITS

OBJECTIVES;

After doing this experiment, you will be able to:

1. Construct half-wave and full-wave rectifier circuits.
2. Identify the output voltage of the half-wave and full-wave rectifier circuits.
3. Calculate the equivalent voltage for the half-wave and full-wave rectifier.
4. Understand the function and operation of clippers.

EQUIPMENTS;

1. Audio (function) generator
2. DC power supply
3. Oscilloscope
4. Multimeter
5. Transformer

COMPONENTS;

1. Resistors (l kΩ , 2.2 kΩ)
2. Silicon diode IN4001

Part A: Half-Wave Rectifier

Procedure:

1. Make a connection as shown in Figure 1.
2. Connect channel 1 (CH1) of the oscilloscope to the secondary side of the transformer and channel 2 (CH2) across 1 kΩ resistor. Sketch both waveforms in Figure A1.
3. Complete Table 1. Show all calculations.
4. Reverse the direction of the diode and sketch the resulting waveform in Figure A2.

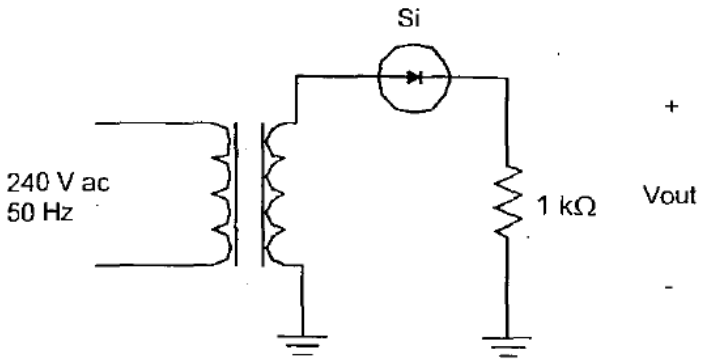

Figure 1

Part B : Full-Wave Rectifier

1. Center-Tap Network

Procedure:

1. l. Make a connection as shown in Figure 2.
2. Connect channel 1 (CH1) of the oscilloscope to the secondary side of the transformer and channel 2 (CH2) across 1 kΩ resistor. Sketch both waveforms in Figure A3.
3. Complete Table 2. Show all calculations.

(Note: The secondary peak voltage must be measured with reference to ground)

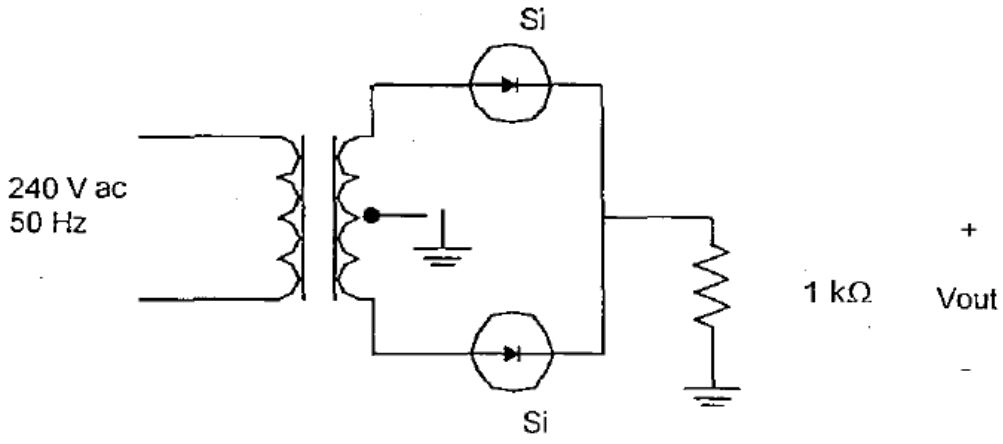

Figure 2

2. Bridge Network

Procedure:

1. Connect channel 1 (CH1) of the oscilloscope to the secondary side of the transformer.
2. Sketch the secondary peak voltage in Figure A4.
3. Make a connection as shown in Figure 3.
4. Connect channel 2 (CH2) of the oscilloscope across 1 kΩ resistor. Sketch the output waveform in Figure A4.
5. Complete Table 3. Show all calculations.

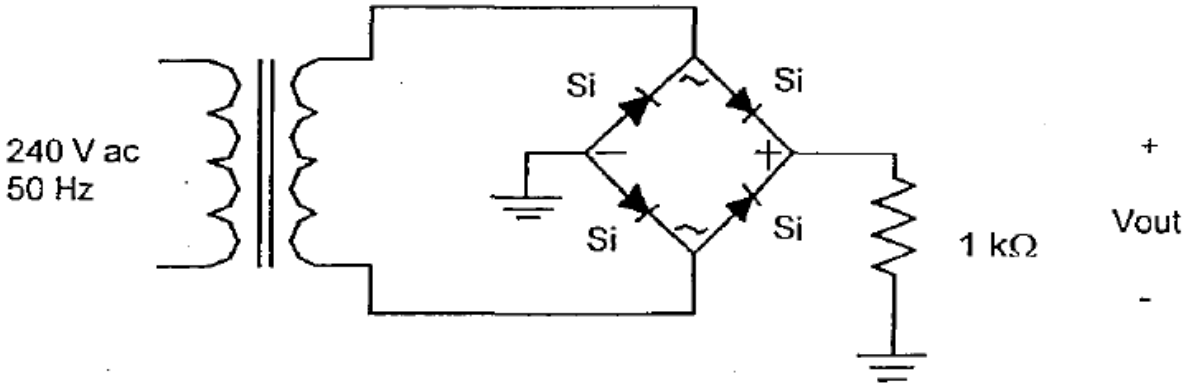

Figure 3

Part C : Clipping Circuits

Procedure:

1. Set the audio / function generator to 400 Hz sine wave. Observe this sine wave with the oscilloscope through CH1. Set the amplitude to 20 $V_{p\text{-}p}$ ($Vs_{p\text{-}p}$).
2. Construct the circuit of Figure 4.
3. Observe the voltage across the resistor (V_o) through CH2. Record the peak value of V_o in Table 4.
4. Set the oscilloscope to view both channels (DUAL). Sketch both waveforms in Figure A5.
5. Construct the circuit of Figure 5.
6. Observe the voltage across the resistor (V_o) through CH2. Record the peak value of V_o in Table 4.
7. Sketch both waveforms in Figure A6.

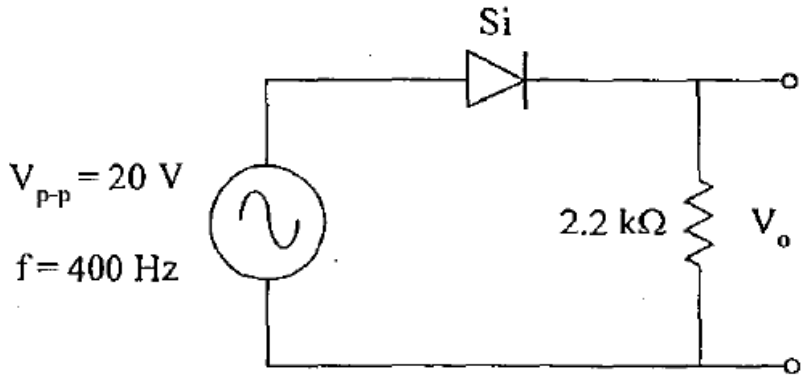

Figure 4

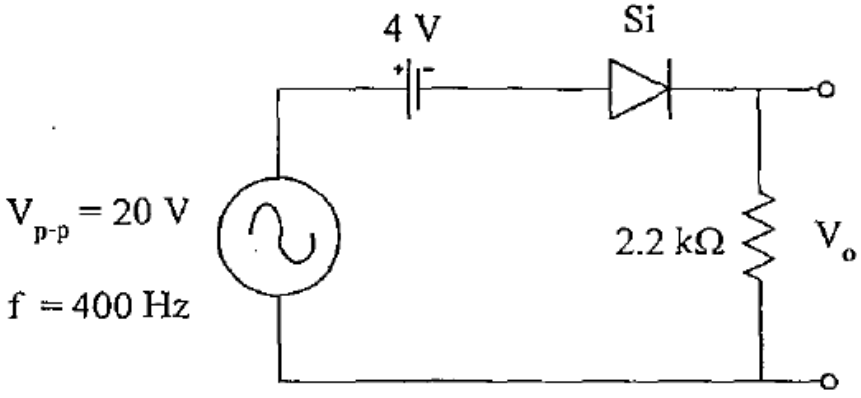

Figure 5