

Fakulti: FAKULTI KEJURUTERAAN ELEKTRIK	
Nama Matapelajaran: Makmal Tahun 4	Semakan : 1
Kod Matapelajaran : SEE 4722	Tarikh Keluaran : 2007
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	No. Prosedur : PK-UTM-FKE-(0)-10



SEE 4722

**FAKULTI KEJURUTERAAN ELEKTRIK
UNIVERSITI TEKNOLOGI MALAYSIA
KAMPUS SKUDAI
JOHOR**


**INSTITUT VOLTAN DAN ARUS TINGGI (IVAT)
STUDENT PACK (Experiment 08)**

**Development of a Portable High Voltage Power Supply using
Flyback Transformer**

Disediakan oleh : Dr. Zolkafle Buntat	Disahkan oleh : Ketua Jabatan
Nama :	Nama :
Tandatangan :	Tandatangan :
Cop :	Cop :
Tarikh : Jun 2007	Tarikh :

1. LIST OF COMPONENTS AVAILABLE

a) High Voltage Measuring units

 Oscilloscope

 H.V Probe

b) Flyback transformer

c) Components for driver circuit

Componenet	Description	Quantity
NE 555	Timer	1
L7805	5V Voltage Reguator	1
2N3055	NPN Bipolar Transistor	1
BU508D	HV Bipolar Transistor	1
	Flyback Transformer	1
5K Ohm Potentiometer	Linear Potemtiometer	2
Red LED	Light Emitting Diode	1
Green LED	Light Emitting Diode	1
1N4007	Diode	1
4.7k Ohm ¼ Watt	Resistor	1
1k Ohm	Resistor	3
470k 2 Watt	Resistor	1
10 ohm 2 Watt	Resistor	1
1.1k Ohm 2 Watt	Resistor	1
1000uF 63Watt	Electrolytic capacitor	1
100nF	Ceramic capacitor	2
15nF	Ceramic capacitor	1
10nF	Ceramic capacitor	1
100uF 63 Watt	Electrolytic capacitor	1
Manual switch on/off	Single circuit switch	2
Bridge rectifier	Bridge rectifier 200V/5A	1
Fuse 1A	Fuse 1A and xocket	1
Transformer	230V/2x24V	1

2. PRELIMINARY WORK RELATED TO THE LABORATORY WORK

You will be better equipped to solve the laboratory problem if you equip yourself with the understanding of the following items:

- i. Flyback transformer and its operation
- ii. Suitable driver circuit to drive the flyback transformer to generate high voltage output.
- iii. Circuit analysis and simulation study using Pspice.
- iv. How to develop and test high voltage power supply
- v. What are the safety requirement when dealing with high voltage system.
- vi. Design and fabrication of PCB using Protel DXP

3. PROBLEM-SOLVING TIME-LINE

Activities	Week 1	Week 2	Week 3	Week 4
1) Understanding/Identify/Brainstorming				
2) Design/Simulation /Experiments				
3) Hardware Development/Testing				
4) Measurements/Data Analysis				
5) Presentation/Report Writing				

4. REPORT WRITING

- d) Other than the general guide specified by the Laboratory Coordinator, your report for this laboratory must also include;
- Results of all the tests.
 - Photographs of the system set-up.
 - Photographs of your group members during hands-on session.

- The group shall submit a write-up on the topic of *Method and Technique to develop a simple portable high voltage power supply* (4 pages) to the facilitator on the **second week** of the laboratory.
- In the report, **you have to consider the several type of transformer (i.e flyback, ignition coil and etc) that can be used to generate high voltage power supply.**

5. REFERENCES

- i) *Internet Sources* (www.jinlabs.org, www.orcad.com, www.kronjaeger.com, www.electronics-lab.com)
- ii) M.S. Naidu and V. Kamaraju (2004). *High Voltage Engineering*. Mc. Graw Hill.
- iii) E. Kuffel and W.S. Zaengl. *High Voltage Engineering, Fundamentals*. Pergamon Press.
- iv) Useful information related to high voltage engineering is available at <http://www.nikhef.nl/~enrichn/highvolt/notes.html>
- v) More information on High voltage power supply.