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ELECTRICAL ENGINEERING COURSE

DIPLOMA PROJECT

DESIGN OF TRANSISTOR
AMPLIFIERS

E/1036

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DESIGN OF TRANSISTOR AMPLIFIERS

by

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Project Report

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in memory of my
grandmother, Despina

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SUMMARY

Design of transistor amplifiers

by

Charalambos Savva

The purpose of this project was to derive the input and output static characteristics for a signal bipolar transistor, a power transistor and an NMOS by experiment, to derive small signal parameters for various operating points and plot the results. Also, to plot the transfer curve of each device and to derive experimentally the turn-on and turn-off time of these transistors.

Finally, to built and analyse a Common Emmitter amplifier, and a Class-A amplifier and compare experimental with theoretical results as derived from the manufacturer's data.

INTRODUCTION

Transistors are used in one form or another in just about every electronic system imaginable. The invention of the first transistor was the beginning of a technological revolution that is still continuing. Almost all the complex electronic devices and systems today are related to semiconductor transistors.

There are two basic types of transistors:

1. the **Bipolar Junction Transistor (BJT)**, and
2. the **Field Effect Transistor (FET)**.

The BJT is used as a linear amplifier to boost or amplify an electrical signal and as an electronic switch.

The FET is a unipolar device and the two main types are:

1. the **Junction FET (JFET)**, and
2. the **Metal Oxide Semiconductor FET (MOSFET)**.

The Bipolar Transistor is a current-controlled device; that is, the base current controls the amount of collector current. The FET is a voltage-controlled device, where the voltage between two of the terminals (gate and source) controls the current through the device and its major feature is its very high input resistance.