PRINCIPLES OF TRANSDUCER DEVICES AND COMPONENTS

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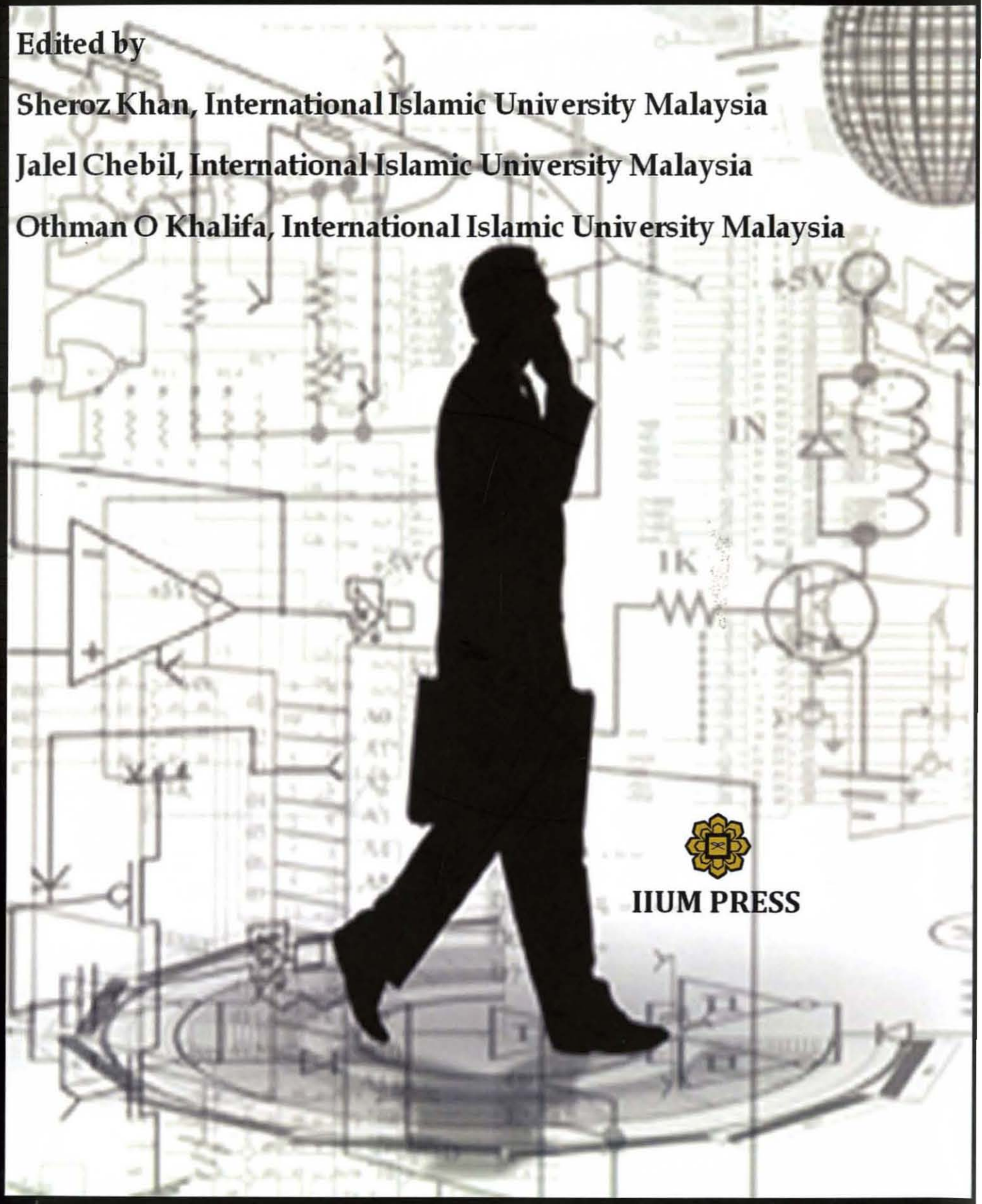

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CONTENTS

Chapter 16

FULL-WAVE RECTIFICATION OF A LOW-VOLTAGE SOURCE

LUTFI TORLA, SHEROZ KHAN, ASAN GANI

16.0 INTRODUCTION

AC voltage supplies are commonly available in our residential or industrial environment, however in consumer electronics the supply required is always DC voltage supply. Many devices employed for sensitive electronic operations, such as fine-tuning and control, require an almost perfect DC voltage level which is normally obtained from the available AC supply. However, maintaining a perfectly constant voltage in the case of a supply is a challenging task to accomplish. The solution for this dilemma is to take the AC voltage and rectify it into a DC voltage supply (Schaefer, 1965; Baliga, 2010). To that end, many such circuits have been constructed. Here we explore a few rectifiers and discuss their method of operation.

16.1 FULL-WAVE BRIDGE RECTIFIER

A full-wave bridge rectifier (as in Figure 16.1) consisting of four diodes is arranged in such a way as to only allow the positive voltage half-cycle to reach the output (Schaefer, 1965). As the AC voltage alternates to its negative voltage peaks, the arrangement of the diodes redirects the current flow to continuously provide a positive voltage at the output.

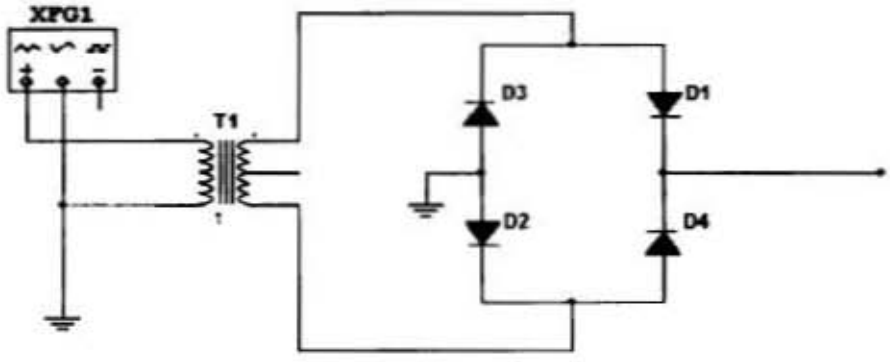

Fig. 16.1: Full-Wave Bridge Rectifier