CHAPTER 1: INTRODUCTION

Fundamentals of Power Electronics

and Frequency
Change and control voltage magnitude

Ac-ac conversion: Change and control voltage magnitude
Magnitude and frequency
Produce sinusoidal or controllable
Possibly control dc voltage, ac current

Ac-dc conversion:

DC-ac conversion:

Power

Input

Control

Switching

Converter

Output

1.1 INTRODUCTION TO POWER PROCESSING

Efficiency @ 95% 10 - 20 KW CONVERTER
A simple dc-dc converter example

Input source: 100V
Output load: 50V, 10A, 500W

How can this converter be realized?

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Use of a SPDT switch

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\[ V = \frac{100V}{A} \]

\[ 10A \]

\[ 50V \]

\[ DT \]

\[ DT - (O - O) \]

\[ V = Dv \]

\[ V_x(t) \]

\[ 1 \]

\[ 2 \]

\[ 14 \]
The switch changes the dc voltage level
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Control is invariably required

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Small-signal equivalent averaged circuit

Part II. Converter dynamics and control

Closed-loop converter system

Averaging the waveforms