Study and Improvement of Single-Stage Power Factor Correction Techniques

Table of Contents

CHAPTER 1 INTRODUCTION
1.1 Background 1
1.2 Review of Power Factor Correction Technique 3
1.3 Motivation and Objectives 10
1.4 Outline 11

CHAPTER 2 GENERAL STUDY OF INTEGRATED SINGLE-STAGE POWER FACTOR CORRECTION CONVERTERS
2.1 Introduction 12
2.2 General Structure of Integrated S²-PFC Converters 13
2.3 Necessary Condition of S²-PFC Converters 21
2.4 Summary 34

CHAPTER 3 STUDY AND IMPROVEMENT OF CCM CURRENT SOURCE SINGLE-STAGE POWER FACTOR CORRECTION CONVERTER
3.1 Introduction 36
3.2 Circuit Intuition and Design Consideration of Current Source S²-PFC Converter 37
3.3 Improved Current Source S²-PFC Converter with Low-Frequency Auxiliary Switch 57
3.4 Summary 70

CHAPTER 4 COMPARISON BETWEEN CCM TWO-STAGE AND SINGLE-STAGE POWER FACTOR CORRECTION CONVERTERS
4.1 Introduction 72
4.2 Comparison Between CCM Two-Stage and Single-Stage Power Factor Correction Converters 73
4.3 Summary 91

CHAPTER 5 CONCLUSIONS 92