

BULETINUL INSTITUTULUI POLITEHNIC DIN IAȘI
Publicat de
Universitatea Tehnică „Gheorghe Asachi” din Iași
Volumul 62 (66), Numărul 1, 2016
Secția
ELECTROTEHNICĂ. ENERGETICĂ. ELECTRONICĂ

SINGLE-PHASE AC-AC CONVERTER

BY

OVIDIU URSARU* and **CRISTIAN AGHION**

Technical University “Gheorghe Asachi” of Iași,
Faculty of Electronics, Telecommunications and Information Technology

Received: February 10, 2016

Accepted for publication: February 29, 2016

Abstract. This paper presents a direct AC-AC single-phase buck-boost converter. The circuit is simple and has good performances, whatever the load nature. The correct functioning of the circuit at a 20 kHz switching frequency was tested both by simulation and experimentally.

Key words: choppers; power conversion; circuit simulation.

1. Introduction

AC-AC converters are currently used in numerous fields, such as: AC motor drive, adjustable AC power supplies, electronic transformers, voltage waveform restorers, adjustable impedances, etc. These converters successfully replace alternating voltage variators using thyristors or triacs. Since the functioning frequency is high (more than 20 kHz), there is no noise, filters are small in size, efficiency is high and the current from the power supply is nearly sinusoidal.

The first AC-AC converters analysed were buck converters (AC choppers) (Revenkar, 1977). References (Chose & Park, 1989; Jang & Choe, 1991; Do-Hyum & Choe, 1995) present improved PWM techniques, which increase the power factor and eliminate certain harmonics (in the absence of grid filters). In (Lucanu & Ursaru, 2003), simulations were used to analyse an

*Corresponding author: *e-mail*: ovidiu@etti.tuiasi.ro