

Vilnius Gediminas Technical University
Faculty of Electronics
Department of Computer Engineering

ISBN ISSN
Copies No.
Date-....-....

Computer Engineering study programme master thesis.

Title: **The Development and Investigation of Direct Current Converter for Alternative Energy Sources**

Author **Andrius Platakis**

Academic supervisor **Doc. Dr. Algirdas Baškys**

Thesis language

☒ Lithuanian

☐ Foreign (English)

Annotation

The work focuses on direct current (DC) converters for alternative energy sources. The data about the general production of electricity and the production of electricity from alternative energy sources in Lithuania and in the world is presented. In the first section the structures and topologies of DC-DC converters are analyzed, the signal formation algorithms and plots of the signals are given and discussed. In the second section the structures and topologies of DC-AC (Alternating Current) converters are analyzed, the signal formation algorithms and plots of the signals are presented. In the third section the output filter is analyzed. The topologies, characteristics, signal plots and equations are presented. In the fourth section the simulation and experimental investigation results are presented and discussed. The 1 kW DC-AC converter with output filter was designed for experimental investigation and a microcontroller-based microcomputer was used for generation of signals for control of converter output transistors. The obtained investigation results were employed for development of the converter for the solar panel. Conclusions in the each section of the thesis are given. General conclusions are formulated at the end of the work.

Thesis consist of: 88 p. text without appendixes, 77 pictures, 9 tables, 28 bibliographical entries.

Appendixes included.

Keywords: alternative energy sources, direct current converter, inverter, output filter, inductor, choke, Matlab Simulink, pulse-width modulation