



PLECS

DEMO MODEL

Buck Converter with Analog Controls

Last updated in PLECS 4.3.1

www.plexim.com

- ▶ Request a PLECS trial license
- ▶ Check the PLECS documentation

1 Overview

This demonstration shows a buck converter with a resistive load. The controller is implemented in PLECS with electrical circuit components; the pulse generation is performed by comparing the output voltage against a sawtooth signal.

2 Model

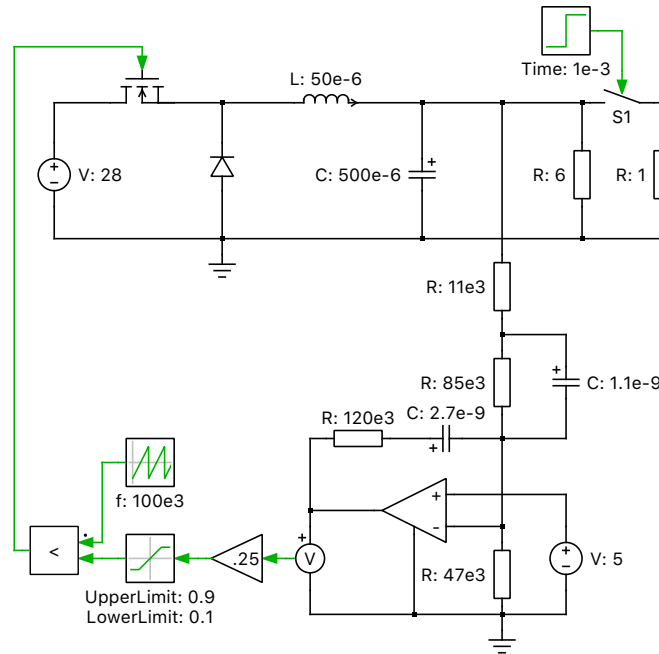


Figure 1: Buck converter with analog controls

The power circuit of the model is using MOSFET as active switching component with resistive load. The output voltage is sensed by the control circuit with one operational amplifier. The control reference is provided by one constant voltage source and is compared to the measurement. Several resistors and capacitors compose the feedback loop, which make the analog circuit works as a PID-type controller.

3 Simulation

After starting the simulation, the analog controller regulate the output voltage to the reference value. At 1 s, additional resistive load is connected by the switch S_1 , and the rising load current and a voltage drop during the transient can be observed.

Revision History:

PLECS 4.3.1 First release

How to Contact Plexim:

| | | |
|---|--|-------|
| ☎ | +41 44 533 51 00 | Phone |
| | +41 44 533 51 01 | Fax |
| ✉ | Plexim GmbH Technoparkstrasse 1 8005 Zurich Switzerland | Mail |
| @ | info@plexim.com | Email |
| | http://www.plexim.com | Web |

PLECS Demo Model

© 2002–2023 by Plexim GmbH

The software PLECS described in this document is furnished under a license agreement. The software may be used or copied only under the terms of the license agreement. No part of this manual may be photocopied or reproduced in any form without prior written consent from Plexim GmbH.

PLECS is a registered trademark of Plexim GmbH. MATLAB, Simulink and Simulink Coder are registered trademarks of The MathWorks, Inc. Other product or brand names are trademarks or registered trademarks of their respective holders.