

PLECS

DEMO MODEL

Resonant Full-Bridge SLR Converter

Last updated in PLECS 4.3.1

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1 Overview

This example shows a full bridge series-loaded resonant (SLR) DC/DC converter with capacitor snubbers parallel to the active switches.

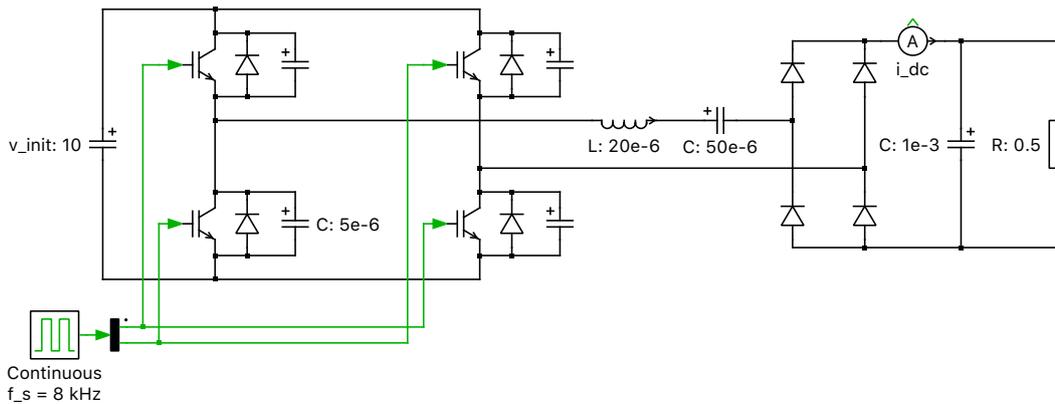


Figure 1: Schematic of the full bridge series-loaded resonant (SLR) DC/DC converter

2 Model

A description of the series resonant converter is given in the demo model “Resonant Half-Bridge SLR Converter” in the PLECS demo models library.

This model uses the same resonant tank with a full bridge switch arrangement and capacitor snubbers in parallel with each switch. The switching frequency was chosen as 8 kHz to operate the converter in continuous conduction mode (CCM). The converter is operated above the resonant frequency of 5,033 Hz, so the IGBTs are switched off while carrying current. The capacitive snubbers are charged by the resonant link current and allow for zero voltage turn-off commutations of the switches.

3 Simulation

Run the simulation with the model as provided to view the signals and verify that the converter operates in CCM. Force the converter into discontinuous conduction mode (DCM) by reducing the switching frequency to 5 kHz. The results for both simulations of the resonant inductor current i_L are given in Fig. 2.

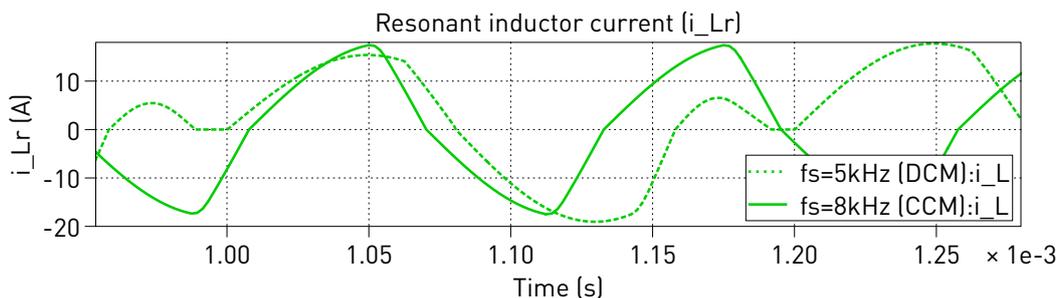


Figure 2: Results of the resonant inductor current simulation for different switching frequencies (5 and 8 kHz)

Revision History:

PLECS 4.3.1 First release

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PLECS Demo Model

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