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OPTIMAL COUPLING COEFFICIENT CALCULATION FOR INDUCTANCES IN INTERLEAVED BIDIRECTIONAL DC-DC CONVERTERS

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Authors

K. Tytelmaier^{1*}, O. Husev^{2}, O. Veligorskyi^{2***}, M. Khomenko^{2****}, D. Maladyka²**

¹ – Tallinn University of Technology,
st. Ehitajate, 5, Tallinn, 19086, Estonia

² – Chernihiv National University of Technology,
st. Shevchenko, 95, Chernihiv, 14035, Ukraine

e-mail: kostya.tytelmaier@gmail.com, oleksandr.husev@ieee.org,

oleksandr.veligorskyi@inel.stu.cn.ua

* ORCID ID : <http://orcid.org/0000-0001-7582-0204>

** ORCID ID : <http://orcid.org/0000-0001-7810-457X>

*** ORCID ID : <http://orcid.org/0000-0002-8256-7339>

**** ORCID ID : <http://orcid.org/0000-0001-9084-3527>

Abstract

This paper shows generalized calculation of coupling coefficient for two-phase interleaved bidirectional converter. Switching period of such system was divided on modes and main

parameters of the system was analyzed in each mode. Current ripple in each phase can be easily determined using calculation results and it depends on the values of duty cycle and coupling coefficient. It is demonstrated that coupling coefficient affects on current ripple in phase, but not on output current ripple. Based on increasing of the one phase inductance due to coupling an optimal coupling coefficient can be selected. Experimental prototype of bidirectional interleaved two-phase converter proved theoretical hypothesis. References 15, figures 4.

Key words: bidirectional power flow, circuit analysis, dc-dc power converter, coupling inductors, pulse width modulation converter.

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