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INPUT VOLTAGE IMBALANCE COMPENSATION IN PEAK CURRENT MODE CONTROLLED HALF BRIDGE CONVERTERS

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ABSTRACT

Instability of the input capacitors' midpoint voltage has been observed to be one of the major obstacles of implementing the peak current mode control in symmetric half bridge converters. Slight variation of the voltage balance in input capacitors may cause serious damages to the operation of the half bridge converter leading total failure of the operation of the power converter. Some methods have been proposed in various papers some of them includes major changes in the power stage which requires specific application oriented design of some of the basic power stage components (ie: transformer) reducing the availability of components for custom designs. This analysis proposes simple but reliable solution to the aforesaid matter without applying any major modification to the power stage of the half bridge converter circuit and its hardware implementation. This discussion will also extend to analyze various instability phenomena's possible in the peak current controlled half bridge converter applications in power conversion.

Keywords: half bridge converter, current mode control, voltage mode control, input voltage imbalance, slope compensation, Peak Current mode control.



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LIST OF ABRREVIATION

Abbreviation	Description
PWM	Pulse width modulation
SMPS	switch mode power Supply

FET	Field effect transistors
Mos FET	Metal oxide field effect transistors
EMI	Electromagnetic interference
ZVS	Zero voltage switching
ZCS	zero current switching
P	Proportional
PI	Proportional Integral
PID	Proportional integral derivative
A/D	Analogue to digital
D/A	Digital to analogue
V_{ref}	Reference Voltage
V_{in}	input voltage
V_o	output voltage
ESR	equivalent series resistance

