

Low Voltage High Current Power Conversion with Integrated Magnetics

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(ABSTRACT)

Very low voltage, high current output requirement have necessitated improvements in power supply's density and efficiency. Existing power conversion techniques cannot meet very stringent size and efficiency requirements. By applying the proposed magnetic integration procedure, new integrated magnetic circuits featuring low loss, simple structure, and ripple cancellation technique are then developed to overcome the limitations of prior art. Both cores and windings are integrated. Consequently, the power loss and the size of the integrated magnetic device are greatly reduced. Detailed analysis and design considerations of the proposed circuits are presented. As a result of applying the proposed technique, very high density, high efficiency, low voltage, high current power modules were developed. A typical example features an isolated 3.3V/30A power module with a power density of 130W/in^3 and an efficiency of 90% at 500 KHz switching frequency.

To my parents

Zhaoping Chen

Dongxuan Li

Table of Contents

Chapter 1 Introduction	1
1.1. Prior-Art and Related Work	6
1.1.1. Resonant Power Conversion and Soft-Switching.....	6
1.1.2. Integrated Magnetic Technique	7
1.1.3. Synchronous Rectification	14
1.2. Outline of Work	22
Chapter 2 Development of Integrated Magnetic Circuits for Low-Voltage, High-Current Applications.....	23
2.1. Overview of Existing Low Voltage Converter Topologies.....	24
2.1.1. Active Clamp Forward Converter with Synchronous Rectifiers (ACFCSR)	24
2.1.2. Half-Bridge Center-Tapped Rectifier with Synchronous Rectifiers (HBCTRSR) and Asymmetrical Duty Cycle Control	25
2.1.3. Half-bridge Current Doubler Rectifier with Synchronous Rectifiers (HBCDRSR) and Asymmetrical Duty Cycle Control.....	27
2.1.4. Prior-Art Half-Bridge Current Doubler Rectifier Circuit With IM Technique	28
2.2. Proposed Integrated Magnetic Circuits	29
2.2.1. Half-Bridge Current Doubler Rectifier Circuit with Improved Integrated Magnetic (HBCDRCI ² M)	30
2.2.2. Improved Current Doubler Rectifier Circuit and Its Integrated Magnetics ..	36
2.2.3. Other Converters with Improved Integrated Magnetics	41
2.3. Summary of Proposed Magnetic Integration Procedure	44
Chapter 3 Analysis of Proposed Integrated Magnetic Circuits	46
3.1. Analysis of FI ² M.....	46
3.1.1. Steady State Operation.....	46
3.1.2. DC Gain	53
3.1.3. Flux Distributions	53

3.1.4.	Loss within Integrated Magnetic Structure	60
3.1.5.	Soft-Switching Technique in FI ² M circuit	61
3.2.	Analysis of HBI ² M circuit	62
3.2.1.	Steady State Operation.....	62
3.2.2.	DC characteristics	65
3.2.3.	Flux Distributions	65
3.3.	Ripple Current Cancellation Technique	68
3.3.1.	Influence of Duty Cycle on Output Ripple Current.....	69
3.3.2.	Influence of Frequency on Output Ripple Current	70
3.3.3.	Influence of Outer-Leg Reluctances on Output Ripple Current.....	70
3.3.4.	Leakage inductance effect near critical duty cycle.....	71
Chapter 4	Design Considerations of Low voltage integrated magnetic converters.....	77
4.1.	Design Considerations of Integrated Magnetic Core	77
4.1.1.	Core cross-sectional areas	78
4.1.2.	Gapping design	80
4.1.3.	Core Window Area	81
4.2.	Improving the Gate-Driving Design for Synchronous Rectifiers	83
4.2.1.	Issue 1: Extend Self-Driven SR to Circuits Whose Transformer Secondary Voltage Has Zero State	85
4.2.2.	Issue 2: Provide Over Voltage Protection and Module Direct-Parallel Capability	90
4.2.3.	Issue 3: Gate Driving Technique of SR for Very Low Output Voltage	92
4.2.4.	Improved Self-Drive Synchronous Rectification Technique for High Output Voltage	94
Chapter 5	Design Examples of High Density High Efficiency Low Voltage Power Supplies	95
5.1.	Design of Low Voltage High Current Power Supplies with Forward Circuit with Improved Integrated Magnetics (FI ² M)	95
5.1.1.	Electrical Design.....	96
5.1.2.	Design of Magnetic Device.....	99
5.1.3.	Stability Issues.....	101

5.1.4. Experimental Results	105
5.2. Design of HDHE Low Voltage, High Current Power Supplies Using HBI ² M Circuit.....	108
5.2.1. Electrical Design.....	109
5.2.2. Magnetic Design.....	110
5.2.3. Packaging Design	111
5.2.4. Experimental Results	111
Chapter 6 New Integrated Magnetic Circuits For Other Applications	113
6.1. Limitations of previously proposed integrated magnetic circuits.....	113
6.2. Development of New Integrated Magnetic Circuit For High Voltage Application 115	
6.3. DC Characteristics	119
6.3.1. Output Ripple Current.....	121
6.3.2. Flux distribution	122
6.4. Design of New Integrated Magnetic Device with Minimum Footprint	123
6.5. Experimental Verifications.....	123
6.6. Other circuits.....	124
6.7. Summary.....	125
Chapter 7 Conclusion.....	126
7.1. Summary.....	127
7.1.1. Topology development and magnetic integration	127
7.1.2. Analysis of Integrated Magnetic Structure	128
7.1.3. Design Guideline for Low Voltage Integrated Magnetic Circuit	130
7.1.4. Experimental Results	132
7.2. Future Work.....	132
7.2.1. Magnetic Integration in Other High Density Applications	132
7.2.2. Rectification Technique	132
7.2.3. Packaging Technique	132
Reference	134
Appendices	140

List of Figures

Figure 1-1 Technical challenges in designing high efficiency, high density, low voltage power supply	2
Figure 1-2 Proposed HB circuit with improved IM circuit [B20, C27], (a) improved HB current doubler circuit with wider duty cycle range, (b) IM structure	4
Figure 1-3 Circuit diagram of proposed Forward circuit with improved IM technique: (a) electrical circuit diagram, (b) IM circuit.....	5
Figure 1-4 Cuk converter and its IM structure [B1, B2].....	9
Figure 1-5 Isolated Cuk converter and its IM structure with ripple steering technique [B1, B2]	10
Figure 1-6 Current doubler rectifier and its integrated magnetics [B16, B17]	12
Figure 1-7 Bassett converter and its integrated magnetics structure ($N_s=N_L$) [B14].....	13
Figure 1-8 Magnetically integrated full wave converter [B10]: (a) discrete full wave double transformer circuit, (b) one implementation of the magnetic devices, (c) IM structure when $N_{p1}=N_{p2}=N_p$, $N_{s1}=N_{s2}=N_s$	14
Figure 1-9 Comparisons of conduction power loss of Schottky diode and low-voltage MOSFET. Schottky: 85CN015 , low-voltage MOSFET: SUP75N03-04	15
Figure 1-10 Survey of Low Voltage MOSFETs (December 1997) (a) measured on-resistance, and (b) measured gate driving loss at different gate voltage	17
Figure 1-11 Common-source configuration of synchronous rectifiers (SR): (a) SR in a two-inductor output circuit, (b) SR in a one-inductor output circuit, (c) general diagram for common-source connected SR.....	18
Figure 1-12 External Driving Scheme for SR	19
Figure 1-13 Direct Self-Driving Scheme for SR	19
Figure 1-14 Module parallel operations.....	20
Figure 2-1 Active clamp forward converter with synchronous rectifier.....	25
Figure 2-2 HB center-tapped rectifier with SR	26
Figure 2-3 HB current doubler rectifier with synchronous rectifier	28
Figure 2-4 HBCDRSR with prior-art integrated magnetics.....	29

Figure 2-5 Prior-art single-turn secondary layout	29
Figure 2-6 Magnetic integration of current doubler circuit. (a) Step 1: inject a current i_p to port ab and derive an E-core structure with N_p winding on center post, (b) Step 2: inject current i_p into port cd to and derive an E-core structure with N_s on one outer leg, (c) Step 3: inject current i_p into port ed to and derive an E-core structure with N_s on the other outer leg, (d) Step 4: inject currents to all three ports and derive an E-core structure with each core leg hosting one winding by applying superposition theory.	32
Figure 2-7 Definition of reluctance in E-core	33
Figure 2-8 HB current doubler rectifier circuit with improved IM structure.....	33
Figure 2-9 Single-turn secondary implementations of the improved IM structure for current doubler rectifier circuit, (a) diagram of improved IM structure, (b) first implementation of single-turn secondary winding, (c) second implementation of single-turn secondary winding, (d) third implementation of single-turn secondary winding (preferred).....	34
Figure 2-10 DC gain of HB current doubler rectifier circuit.....	37
Figure 2-11 HB with improved current doubler rectifier circuit [B9, C16].....	38
Figure 2-12 DC gain of HB improved current doubler rectifier circuit ($N_p=1$)	38
Figure 2-13 Derivation of new integrated magnetic structure (a) inject current source into port ab, (b) inject current into port cd, (c) inject current into port de, (d) new integrated magnetic structure via superposition theory [C16]	40
Figure 2-14 Proposed integrated magnetic circuit for HB with improved current doubler rectifier circuit	41
Figure 2-15 Circuit diagram of proposed FI ² M, (a) electrical circuit diagram, (b) integrated magnetic implementation.....	42
Figure 2-16 DC gain of FI ² M	43
Figure 2-17 Other Circuit Topologies with Proposed Integrated Magnetic Structure	44
Figure 3-1 Improved IM circuit: (a) HBI ² M, (b) FI ² M.....	47
Figure 3-2 Sub-topology for [0, DT]. Top: integrated magnetic circuit, Bottom: reluctance circuit	49

Figure 3-3 Sub-topology for [DT, T]: Top: integrated magnetic circuit, Bottom: Reluctance circuit	50
Figure 3-4 Voltage Waveform in FI ² M Circuit	51
Figure 3-5 Current Waveform in FI ² M circuit and Its Equivalent Circuit.....	52
Figure 3-6 Flux distribution within each core Leg	54
Figure 3-7 Maximum flux density vs. duty cycle (outer leg gap is 0.2mm).....	58
Figure 3-8 Influence of gapping on DC flux densities (D=0.49): (a) influence of outer leg gapping on the dc flux densities, with no gap in center post, two outer legs are evenly gapped; (b) influence of center post gapping on the dc flux densities, with both outer legs pregapped at 0.2mm. Plots are generated on E32 planar core.	59
Figure 3-9 Loss within Integrated Magnetic Structure in FI ² M Circuit: (a) copper loss, (b) core loss	61
Figure 3-10 Steady state operation of HBI ² M: (a) stage 1, Q1 on, (b) stage 2, Q1 off	64
Figure 3-11 Conversion gain of HBI ² M under different N ₂ /N ₁	65
Figure 3-12 Influence of Duty Cycle on Output Ripple Current.....	69
Figure 3-13 Influence of Reluctance on Output Ripple Current	71
Figure 3-14 Simulation waveform of output ripple current with and without leakage inductance	72
Figure 3-15 Equivalent electrical circuit of the proposed IM structure considering the leakage fluxes in windings: (a) definitions of the fluxes in physical structure, (b) reluctance circuits, (c) electrical circuit	73
Figure 3-16 Illustration of Secondary Side Current Commutation in FI ² M Circuit	75
Figure 3-17 Waveforms to illustrate the leakage inductance's effect on the output ripple current	75
Figure 4-1 Definitions of cross-sectional areas, air gaps, and core window areas. Outer leg 1 hosts winding N_1 , outer leg 2 hosts winding N_2 and center post hosts winding N_p	77
Figure 4-2 Relationship between maximum output ripple current and critical duty cycle point.	79
Figure 4-3 Gate drive schemes for SR (a) external driving, (b) self-driving	84

Figure 4-4 Scheme 1: Hybrid gate-drive scheme for SR in circuits whose transformer secondary voltage has a zero state.....	86
Figure 4-5 Discharging procedure of C_g : (a) Step 1, discharge of C_g , (b) Step 2: reset L_d	87
Figure 4-6 Generation of gate signals for Q_a	88
Figure 4-7 Experimental waveforms (example circuit: 2-switch forward, $V_{in}=48V$, $V_o=1.2V$, $I_o=60A$)	89
Figure 4-8 Measured efficiency comparisons	90
Figure 4-9 Scheme 2: improved self-drive scheme for SR with the capabilities of the gate over-voltage protection and the direct module-parallel operation	91
Figure 4-10 Scheme 3: improved gate drive schemes for low output voltage: (a) Scheme 3A, (b) Scheme 3B	93
Figure 4-11 Improved hybrid gate-drive schemes for SRs in low voltage output circuits whose secondary voltage has zero state.....	93
Figure 4-12 Scheme 4: Gate driving scheme of SRs for high output voltage using CZS technique	94
Figure 5-1 Proposed block diagram of power supply for 2.5V/140A output	97
Figure 5-2 Power stage schematic for Example 5-1, (a) main power train, (b) gate drive scheme for SR	98
Figure 5-3 Four winding arrangements.....	99
Figure 5-4 Mechanical outline of complete magnetic device	100
Figure 5-5 Average circuit model for power stage (a) power stage, (b) average circuit model.....	101
Figure 5-6 Control-to-output function under different duty cycle. In this plot: at 20Vin, $D > D_{crit}$; at 30Vin, $D < D_{crit}$. In this plot, $V_{in}=20-30V$, $V_o=2.8V$, $I_o=1A$, $f_s=200kHz$, $N=4:1$, $L_m=47\mu H$ (measured from the primary side), $C_c=0.68\mu F$ $L_1=L_2=1.9\mu H$ (measured from the secondary side), $C_f=110\mu F$ MLC (measured from the secondary side).....	103
Figure 5-7 Plots of control-to-output function with and without damping branch: $C_d=3C_c$, $K_r=4$ (a) 20Vin, $D > D_{crit}$ (b) 30Vin, $D < D_{crit}$	105
Figure 5-8 Measured power stage efficiency vs. load current, $V_{in}=70V$, $V_o=2.55V$	106

Figure 5-9 Measured efficiency with 1.2-1.8V output	108
Figure 5-10 Complete schematic of HDHE hybrid module using HBI ² M topology.....	109
Figure 5-11 Experimental waveforms on Q2	112
Figure 5-12 Picture of the preliminary hybrid module	112
Figure 6-1 Low voltage integrated magnetic circuits (a) HBI ² M, (b) FI ² M	114
Figure 6-2 Planar winding structure in HBI ² M and FI ² M with different secondary configuration: (a) single turn secondary winding, $N_1=N_2=1$, (b) multi-turn secondary windings, $N_1>1$ and $N_2>1$	115
Figure 6-3 New rectifier circuit with current ripple cancellation technique	116
Figure 6-4 Magnetic integration of new rectifier circuit: (a) Step 1: inject a current i_p to port ab and derive an E-core structure with N_p winding on center post, (b) Step 2: inject current i_s into port ce to and derive an E-core structure with N_s on center post, (c) Step 3: inject current i_o into port ed to and derive an E-core structure with N_o on the other outer leg, (d) Step 4: inject currents to all three ports and derive an E-core structure with center post hosting windings N_p and N_s , one outer leg hosting winding N_o by applying superposition theory.....	118
Figure 6-5 Integrated magnetic implementation of the proposed new rectifier circuit	119
Figure 6-6 New integrated magnetic circuit in half-bridge configuration	120
Figure 6-7 Two operation stages of the new HB integrated magnetic circuit: (a) [0, DT], $i_s=0$, (b) [DT, T], $i_s=i_o$	120
Figure 6-8 Planar winding configuration for proposed high voltage integrated magnetic circuit with $N_o=1$	123
Figure 6-9 Experimental Result with New HB Integrated Magnetic Circuit: IM core is implemented with E22 core with only outer leg 2 gapped by 6 mils. $N_s=2$, $N_o=1$. Top trace: $V_{gs}(Q1)$ (20V/div), Middle: V_{ec} (transformer secondary waveform, 5V/div), Bottom: I_o , (0.2A/div).....	124
Figure 6-10 A family of new IM circuits derived from the proposed rectifier topology	125

List of Tables

Table 2-1 Comparison of voltage stress and current stress of HB current doubler rectifier circuit and the proposed circuit. $N_p=1$, $I_{in}=1$ A, $V_{in}=16.67$ V, $V_o=5$ V.....	37
Table 5-1 Comparison of AC winding loss and leakage inductance for the winding arrangements shown in Figure 5-3. 2-D FEA solver was used to obtain this result ($f_s=100$ KHz).....	100
Table 5-2 Winding power loss with different winding arrangement obtained by FEA 2-D simulation, E22 Core, $I_o=30$ A, $f_s=500$ kHz.....	110
Table 6-1 Leakage inductance (obtained by 2-D FEA simulation) associated with the turns number of the secondary winding ($N=N_p/N_s=1:1$), E22 core	114