

APEC 07 - Twenty-Second Annual IEEE Applied Power Electronics Conference and Exposition

**Anaheim, CA
February 25 - March 1, 2007**

Volume 1 of 3



IEEE Catalog Number: 07CH37843
ISBN: 1-4244-0713-3

Table of Contents

Digital State Feedback Current Control Using the Pole Placement Technique and the 42V/14V Bi-Directional DC-DC Converter Application	1
<i>H. S. Bae, J. H. Yang, J. H. Lee, Bo H. Cho</i>	
Predictive Digital Current Control Using Advanced Average Current Sampling Algorithm for Multi-Phase 2-Quadrant DC/DC Converters.....	6
<i>I. Voss, S. Schröder, R. W. De Doncker</i>	
Autotuning Techniques for Digitally Controlled Point-of-Load Converters with Wide Range of Capacitive Loads.....	12
<i>M. Shirazi, R. Zane, D. Maksimovic, L. Corradini, P. Mattavelli</i>	
Virtual Prototyping of Universal Control Architecture Systems by Means of Processor in the Loop Technology	19
<i>G. Francis, R. Burgos, P. Rodriguez, F. Wang, D. Boroyevich, R. Liu, A. Monti</i>	
High-Performance Mixed-Signal Voltage-Mode Control for Dc-Dc Converters with Inherent Analog Derivative Action	26
<i>S. Saggini, P. Mattavelli, M. Ghioni</i>	
Digital Controller Design for a Practicing Power Electronics Engineer.....	32
<i>H. Al-Atrash, I. Batarseh</i>	
Universal and Fault-Tolerant Multiphase Digital PWM Controller IC for High-Frequency DC-DC Converters.....	40
<i>Zdravko Lukic, Christopher Blake, Santa C. Huerta, Aleksandar Prodic</i>	
A Fabrication Method for Integrated Filter Elements with Inductance Cancellation	46
<i>Brandon J. Pierquet, Timothy C. Neugebauer, David J. Perreault</i>	
Thin Amorphous Films for Power Magnetic Components	58
<i>Waseem A. Roshen</i>	
Magnetic Material Comparisons for High-Current Inductors in Low-To-Medium Frequency DC-DC Converters	66
<i>Brendan J. Lyons, John G. Hayes, Michael G. Egan</i>	
Aluminum Windings and Other Strategies for High-Frequency Magnetics Design in an Era of High Copper and Energy Costs	73
<i>Charles R. Sullivan</i>	
Modeling of an LTCC Inductor Capable of Improving Converter Light-Load Efficiency	80
<i>Michele H. Lim, J. D. van Wyk, K. D. T. Ngo</i>	
Loss Characterization and Calculation of Nanocrystalline Cores for High-Frequency Magnetics Applications.....	85
<i>W. Shen, F. Wang, D. Boroyevich, C. W. Tipton</i>	
Series-Coupling Test Characterization of On-chip Silicon-Integrated and PWB-Integrated Transformers.....	92
<i>John G. Hayes, Michael G. Egan, Ningning Wang, Terence O'Donnell</i>	
Output Impedance Oriented Design for Voltage Regulator with High Repetitive Rate Transient.....	99
<i>Wenkai Wu, George Schuellein</i>	
Novel Coupled-Inductor Multi-Phase VRs.....	105
<i>Ming Xu, Yucheng Ying, Qiang Li, Fred C. Lee</i>	
Light Load Efficiency Improvement for Laptop VRs	112
<i>Julu Sun, Yuancheng Ren, Ming Xu, Fred C. Lee</i>	
3D Power Delivery for Microprocessors and High-Performance ASICs.....	119
<i>Jian Sun, Jian-Qiang Lu, David Giuliano, T. Paul Chow, Ronald J. Gutmann</i>	
A Novel Non-Isolated Full Bridge Topology for VRM Applications.....	126
<i>Sheng Ye, Wilson Eberle, Yan-Fei Liu</i>	

Table of Contents

Design and Performance of a Resonant LLC 48V Voltage Regulator Module with a Self-Sustained Oscillation Controller.....	133
<i>Mohamed Z. Youssef, Praveen K. Jain</i>	
Novel Current Sharing Schemes for Multiphase Converters with Digital Controller Implementation	140
<i>Jaber A. Abu Qahouq, Lilly Huang, Doug Huard, Allan Hallberg</i>	
Isolated EWiRaC: A New Low-Stress Single-Stage Isolated PFC Converter.....	149
<i>Henrik Schneider, Stefan Bergendorff, Lars Petersen, Michael A.E. Andersen</i>	
Performance Evaluation of Bridgeless PFC Boost Rectifiers	155
<i>Laszlo Huber, Yungtaek Jang, Milan M. Jovanovic</i>	
A New 3-Phase Buck-Boost Unity Power Factor Rectifier with Two Independently Controlled DC Outputs	162
<i>Y. Nishida, J. Miniboeck, S. D. Round, J. W. Kolar</i>	
New Architecture for MHz Switching Frequency PFC	169
<i>Chuanyun Wang, Ming Xu, Bing Lu, Fred C. Lee</i>	
A Unity Power Factor Correction Preregulator with Fast Dynamic Response Based on a Low-Cost Microcontroller.....	176
<i>D. G. Lamar, A. Fernández, M. Arias, M. Rodríguez, J. Sebastián</i>	
Quasi-Active Power Factor Correction Circuit for HB LED Driver	183
<i>K. Zhou, J.G. Zhang, S. Yuvarajan, D. Weng</i>	
A Digital PFC Controller Without Input Voltage Sensing.....	188
<i>Barry Mather, Bhaskar Ramachandran, Dragan Maksimovic</i>	
Stator Flux Vector Control of Induction Motor Drives in the Field-Weakening Region.....	195
<i>Michele Mengoni, Luca Zarri, Angelo Tani, Claudio Rossi, Giovanni Serra, Domenico Casadei</i>	
Adaptive Stator Resistance Estimation Method for Speed Sensorless DTC Controlled IM Drives.....	202
<i>Xiaohong Nian, Tao Wang, Jian Wang, Weihau Gui, Jirong Huang</i>	
A New Method of Utilizing Ultra-Capacitor Energy Sources in Hybrid Electric Vehicles Over a Wide Speed Range	210
<i>Shuai Lu, Keith Corzine, Mehdi Ferdowsi</i>	
Speed Control of a Dual Stator Winding Induction Machine.....	217
<i>Olorunfemi Ojo, Zhiqiao Wu</i>	
Output Filters for AC Adjustable Speed Drives	224
<i>Norbert Hanigovszki, Jorn Landkildehus, Frede Blaabjerg</i>	
Low-Cost Motor Drive-Embedded Fault Diagnosis - A Simple Harmonic Analyzer.....	231
<i>Bilal Akin, Hamid A. Toliat, Umut Orguner, Mark Rayner</i>	
An Improved Matrix Converter Fed Induction Motor Vector Control Drive with Output Voltage Error Cancellation.....	238
<i>Kai Sun, Lipei Huang, Kouki Matsuse</i>	
Dimmable Electronic Ballast for 250W HPS Lamp in Street Lighting with Analog Dimming Interface Circuit.....	244
<i>Hankui Liu, Yijie Wang, Xiangjun Zhang, Dianguo Xu, Lili Guo</i>	
The Design of High Performance Protection-Functions for Electronic Ballasts.....	248
<i>S.T. Chen, L.L. Lee, H.J. Lee, C.R. Lee</i>	
High-Intensity-Discharge Lamp Ballast with Igniter Driven by Dual-Frequency Inverter.....	253
<i>Yuequan Hu, Milan M. Jovanovic</i>	
A High-Power-Density Integrated Electronic Ballast for Low Wattage HID Lamps.....	259
<i>Yan Jiang, Wenduo Liu, Yan Liang, J. D. van Wyk, Fred C. Lee</i>	
Digitally Addressable Digital Dimming Electronic Ballast Based on CAN Bus.....	266
<i>E. Rodriguez, J. Diaz, N. Vázquez, J. Hurtado, J. Correa</i>	

Table of Contents

Digital Architecture for Driving Large LED Arrays with Dynamic Bus Voltage Regulation and Phase Shifted PWM.....	272
<i>Montu Doshi, Regan Zane</i>	
A Cost Effective PDP Sustainer Using Two-Winding Transformer with Hybrid Operation	279
<i>W.S. Kim, S.Y. Chae, B.C. Hyun, D.Y. Lee, B.H. Cho</i>	
A PWM Strategy for Acoustic Noise Reduction for Grid-Connected Single-Phase Inverters.....	284
<i>Riming Shao, Zhenhong Guo, Liuchen Chang</i>	
Elimination of Dead-time in PWM Controlled Inverters.....	289
<i>Lihua Chen, Fang Z. Peng</i>	
Carrier-Based Modulation Method for Matrix Converter with Input Power Factor Control and Under Unbalanced Input Voltage Conditions.....	293
<i>Young-Doo Yoon, Seung-Ki Sul</i>	
A New Generalized Discontinuous-PWM Strategy for Active Power Filters.....	298
<i>L. Asiminoaei, P. Rodriguez, F. Blaabjerg</i>	
Energy-Efficient Peak-Current Controlled Power Conversion IC Family Delivers 3 to 28 Watts in Universal-Input Flyback Power Supplies	305
<i>Kent Wong, John Jovalusky</i>	
Performance Analysis of Trench Power Mosfets in Synchronous Buck Converter Applications	312
<i>X. Cheng, Y. Xiong, X. Wang, P. Kumar, Z. J. Shen</i>	
A Study on SiC Devices in Synchronous Rectification of DC-DC Converter.....	319
<i>Tsuyoshi Funaki, Masashi Matsushita, Masashi Sasagawa, Tsunenobu Kimoto, Takashi Hikihara</i>	
Evaluation of SiC JFETs for a Three-Phase Current-Source Rectifier with High Switching Frequency	325
<i>Callaway J. Cass, Yi Wang, Rolando Burgos, T. Paul Chow, Fred Wang, Dushan Boroyevich</i>	
An Analog CMOS Double-Edge Multi-Phase Low-Latency Pulse Width Modulator.....	332
<i>Jianhui Zhang, Seth R. Sanders</i>	
Multiple Load-Source Integration in a Multilevel Modular Capacitor Clamped DC-DC Converter Featuring Fault Tolerant Capability.....	338
<i>Faisal H. Khan, Leon M. Tolbert</i>	
A Novel Voltage-Boosting Converter: KY Converter	345
<i>K. I. Hwu, Y. T. Yau</i>	
A Novel Three Level Full Bridge Resonant Dc-Dc Converter Suitable for High Power Wide Range Input Applications.....	350
<i>Wei Chen, Yilei Gu, Zhengyu Lu</i>	
Feedback-Based Mitigation of Torque Harmonics in Switched Reluctance Motor Drives.....	357
<i>A. C. Koenig, S. D. Pekarek</i>	
An Investigation on Asymmetry Effects in Linear Induction Machines.....	364
<i>H. Yu, B. Fahimi</i>	
Very Low Speed Sensorless Vector Control of Synchronous Reluctance Motors with a Novel Startup Scheme	370
<i>Ghaderi Ahmad, Hanamoto Tsuyoshi</i>	
Method for Estimating the Stroke of LPMSM Driven by PWM Inverter in a Linear Compressor	377
<i>Tae-Won Chun, Jung-Ryol Ahn, Quang-Vinh Tran, Hong-Hee Lee, Heung-Gun Kim</i>	
Thermal Design Considerations for Surface Mount Power ICS	381
<i>Charles Mauney, Jinrong Qian</i>	
Package Alternatives for Integrated Power Electronic Modules (IPEM) with Improved Voltage Rating.....	388
<i>Jing Xu, J. D. van Wyk, Khai Ngo</i>	

Table of Contents

Power Management Device Characteristics for Semiconductor Test Instrumentation	394
<i>W. J. Bowhers</i>	
Rapid Construction of a 100KW Three-Level Inverter for Synchronous Motor Based on a Universal Digital Platform, Software Building Blocks and PEBBs	399
<i>Haibing Hu, Wenxi Yao, Wei Chen, Zhengyu Lu, Zhaoming Qian</i>	
The Spatial Effect and Compensation of Current Sensor Gain Deviation for Three-Phase Three-Wire Systems	404
<i>Michael C. Harke, Robert D. Lorenz</i>	
Universal Approach to Modeling Current Mode Controlled Converters in Distributed Power Systems for Large-Signal Subsystem Interactions Investigation	411
<i>Runxin Wang, Jinjun Liu, Hao Wang</i>	
Evolutionary Optimization of Power Electronics Based Power System	418
<i>R. R. Chan, S. D. Sudhoff, Y. Lee, E. L. Zivi</i>	
Black-Box Terminal Characterization Modeling of DC-to-DC Converters.....	426
<i>Luis Arnedo, Rolando Burgos, Fred Wang, Dushan Boroyevich</i>	
SPLL based Control for Active Filter with Reactive Power Compensation.....	433
<i>Francisco D. Freijedo, Jesus Doval-Gandoy, Oscar Lopez, Carlos M. Penalver, Andres Nogueiras</i>	
Design of a New DC Link Voltage Controller for Universal Power Quality Controllers.....	439
<i>ZHANG Hui, LIU Jinjun, HUANG Ximeng, WANG Zhaoan</i>	
Improvement of One-Comparator Counter-Based PWM Control by Applying a Sawtoothed Wave Injection Method.....	444
<i>K. I. Hwu, Y. T. Yau</i>	
Nonlinear Average Current Control Using Partial Current Measurement	448
<i>Min Chen, Jian Sun</i>	
Unified Control Strategy Covering CCM and DCM for a Synchronous Buck Converter.....	455
<i>Dirk Hirschmann, Sebastian Richter, Christian Dick, Rik W. De Doncker</i>	
A Novel Control Scheme for MHz Range Interleaved Multiphase Resonant VRM.....	461
<i>Wei Chen, Zhengyu Lu, Zhaoming Qian, Shaoshi Ye</i>	
Average Modeling and Analysis of a Flyback with Active Clamp Topology Based on a Very Simple Transformer	466
<i>A. Bakkali, P. Alou, J.A. Oliver, J.A. Cobos</i>	
Design of a 6 kW Multiple-Input Bi-Directional DC-DC Converter with Decoupled Current Sharing Control for Hybrid Energy Storage Elements	473
<i>Danwei Liu, Hui Li, Laura D. Marlino</i>	
A New Control Strategy for Doubly-Fed Induction Generator for Wind Power Generation	478
<i>Eui-Cheol Nho, Chia-Wei Su, Chih-Sheng Liao, Lihua Li, Marc E. Davis-Marsh , Keyue Ma Smedley</i>	
Portable Solar Systems using a Step-up Power Converter with a Fast-Speed MPPT and a Parallel-configured Solar Panel to Address Rapidly Changing Illumination	484
<i>Lijun Gao, Roger A. Dougal, Shengyi Liu, Albena Iotova</i>	
An Integrative Control Scheme for Boost-Buck Inverter in Grid Connected Photovoltaic Systems	488
<i>Mi Dong, An Luo, Lisha Bai, Jian Yang</i>	
Modeling and Control of Brushless Doubly-Fed Induction Generators in Wind Energy Applications.....	493
<i>Kostyantyn Protsenko, Dewei Xu</i>	
New Converter Topologies for Two-Phase Wind Turbine PMSG Generation System	500
<i>Zhenhong Guo, Liuchen Chang</i>	
Highly Efficient VRM for Wide Load Range with Dynamic Non-Uniform Current Sharing.....	504
<i>Jaber A. Abu Qahouq, Lilly Huang</i>	

Table of Contents

Transient Analysis of the Novel Voltage Divider	511
<i>Julu Sun, Ming Xu, Fred C. Lee</i>	
A Digital Predictive On-Line Energy Optimization Scheme for DC-DC Converters.....	518
<i>Olivier Trescases, Guowen Wei, Aleksandar Prodic, Wai Tung Ng, K. Takasuka, T. Sugimoto, H. Nishio</i>	
An Architecture without Current-sensing Circuits for Digital DC-DC Controller to Achieve Adaptive Voltage Position	524
<i>Peipei Gu, Wenhong Li</i>	
Optimum Bias Calculation for Parallel Hybrid Switching-Linear Regulators	530
<i>Jason T. Stauth, Seth R. Sanders</i>	
Dual Path Internal Frequency Compensator in DC/DC Converter.....	536
<i>Sang Hwa Jung, Dong Hee Kim, Dong Hun Lee</i>	
A Low-Delay Digital PWM Control Circuit for DC-DC Converters.....	540
<i>Yoichi Ishizuka, Masao Ueno, Ichiro Nishikawa, Akira Ichinose, Hirofumi Matsuo</i>	
A Simple Flux Model Based Observer for Sensorless Control of Switched Reluctance Motor	546
<i>Jinhui Zhang, Xiaohu Feng, Arthur V. Radun</i>	
Modeling and Control of a Boost Chopper Linked to an AC Drive System for Hybrid Electric Vehicle.....	552
<i>Y. Jeong</i>	
Design Oriented Analysis of DC Link Current Observer of a Three-Phase Double Conversion Uninterruptable Power System or Adjustable Speed Drive.....	557
<i>Kevin Lee, Ian T. Wallace, Atul S. Bhadkamkar</i>	
Balancing Hall Effect Signals in Low-Precision Brushless DC Motors	565
<i>N. Samoylenko, Q. Han, J. Jatskevich</i>	
A High-Performance Z-Source Inverter Operating with Small Inductor at Wide-Range Load.....	571
<i>Xinping Ding, Zhaoming Qian, Shuitao Yang, Bin Cui, Fangzheng Peng</i>	
Single-Phase Four Switches Z-Source AC-AC Converter.....	577
<i>Yu Tang, Chaohua Zhang, Shaojun Xie</i>	
Performance Evaluation of Three-Level Z-Source Inverters Under Semiconductor Failure Conditions	582
<i>F. Gao, P. C. Loh, D. M. Vilathgamuwa, F. Blaabjerg</i>	
New Three-phase Inverter with Dual-Loop Compensator.....	589
<i>Lihua Li, Keyue Smedley, Taotao Jin</i>	
A D-Q Frame Controller for a Full-Bridge Single Phase Inverter Used in Small Distributed Power Generation Systems	595
<i>Arman Roshan, Rolando Burgos, Andrew C. Baisden, Fred Wang, Dushan Boroyevich</i>	
A Direct Peak DC-link Boost Voltage Control Strategy in Z-Source Inverter.....	602
<i>Xinping Ding, Zhaoming Qian, Shuitao Yang, Bin Cui, Fangzheng Peng</i>	
Current Loop Control with Admittance Compensation for a Single-Phase Grid-Tie Fuel Cell Power Conditioning System.....	608
<i>Sung-Yeul Park, Jih-Sheng Lai, Chien-Liang Chen, Seung-Ryul Moon, Tae-Won Chun</i>	
Applications of an Auxiliary Resonant Commutated Pole Converter	615
<i>A. Williams, A. Gattozzi, R. F. Thelen</i>	
A Novel High Density 100kW Three-Phase Silicon Carbide (SiC) Multichip Power Module (MCPM) Inverter.....	620
<i>Edgar Cilio, Jared Hornberger, Brice McPherson, Roberto Schupbach, Alexander Lostetter, John Garrett</i>	
A Family of Control Methods for Parallel Active Power Filters Based on Current Detection.....	627
<i>Xiaoyu Wang, Jinjun Liu, Chang Yuan, Zhaoan Wang</i>	
A Novel Control of Parallel Active Power Filter for Fast-Changing Dynamic Load.....	634
<i>Yuan Chang, Liu Jinjun, Wang Xiaoyu, Wang Zhaoan</i>	

Table of Contents

Control Strategy of Multi-modular Active Power Filter System.....	638
<i>Jianyong Ju, Dehong Xu, Min Chen, Jun Xu, Baiqiang Shen, Fan Zhang</i>	
Analysis and Design of a Novel Phase-lead Compensation Control Strategy for the SHAPF	644
<i>Liqing Tong, Zhaoming Qian, Yantao Song, Naixing Kuang, Fang Z. Peng</i>	
Single-Phase Universal Active Filter Without Transformer.....	650
<i>C. B. Jacobina, W. R. N. Santos, A. C. Oliveira, E. R. C. da Silva, E. C. dos Santos Jr.</i>	
Experimental Validation of the Advantages Provided by Linear – Non – Linear Control in a Multi-Phase VRM.....	656
<i>J. Quintero, A. Barrado, M. Sanz, A. Lázaro, E. Olías</i>	
Synchronous Buck Converter with Increased Efficiency.....	663
<i>Rais Miftakhutdinov, Joseph Zbib</i>	
A Digital Multi-Mode Multi-Phase IC Controller for Voltage Regulator Application	668
<i>Jianhui Zhang, Seth R. Sanders</i>	
A 100MHz Eight-Phase Buck Converter Delivering 12A in 25mm² Using Air-Core Inductors	676
<i>G. Schrom, P. Hazucha, F. Paillet, D. J. Rennie, S. T. Moon, D. S. Gardner, T. Karnik, P. Sun, T. T. Nguyen, M. J. Hill, K. Radhakrishnan, T. Memioglu</i>	
Multi-Phase Inductor Coupling Scheme with Balancing Winding in VRM Applications	680
<i>Zengyi Lu, Wei Chen</i>	
Compensation Circuit Design Considerations for High Frequency DC/DC Buck Converters with Ceramic Output Capacitors	685
<i>A. Abou-Alfotouh, A. Lotfi, M. Orabi</i>	
Design and Implementation of High Power Density Three-Level Parallel Resonant Converter for Capacitor Charger.....	692
<i>H. Sheng, W. Shen, H. Wang, D. Fu, Y. Pei, X. Yang, F. Wang, D. Boroyevich, F. C. Lee, C. W. Tipton.</i>	
Modeling and Analysis of a High-Voltage DC-DC Converter with Vin/3-Voltage Stress on the Primary's Switches	697
<i>Ting-ting Song, Henry S.H. Chung, Saad Tapuhi, A. Ioinovici</i>	
An Improved Synchronous Rectification Circuit in Active-Clamp Forward Converter	704
<i>Yu Ma, Qian Ouyang, Xiaogao Xie, Zhaoming Qian</i>	
A Bi-Directional DC/DC Converter for Energy Storage Systems	708
<i>Shigenori Inoue, Hirofumi Akagi</i>	
Static and Dynamic Characteristics of Forward-Flyback-Mixed Converter	715
<i>Yoshito Kusuhara, Asahi Nakayama, Tamotsu Ninomiya, Shin Nakagawa</i>	
New Hybrid Driving Scheme for SRs to Improve the Efficiency of Active Clamped Forward Converters	721
<i>Xiaogao Xie, Lei Miao, Junming Zhang, Zhaoming Qian</i>	
Evaluation of 3-Phase to 9-Phase Transformer, 18-Pulse Converter, and Adjustable Speed Drive, Including Novel Third Harmonic Calculations.....	726
<i>Kevin Lee, James E. Armes, Derek A. Paice</i>	
A Universal Single-stage AC-DC Front-end Resonant Converter with a New Active Current Mode Controller: Performance and Design	735
<i>Mohamed Z. Youssef, Praveen K. Jain</i>	
Reactive Power Control Realizations in Single-Phase Active-Front-End Converters.....	742
<i>Konstantin P. Louganski, Jih-Sheng Lai</i>	
A New Family of Rectification Topologies.....	749
<i>Liangbin Yao, Issa Batarseh</i>	
Three-Phase Isolated High-Power-Factor Rectifier Using Soft-Switched Two-Switch Forward Converter.....	754
<i>Yungtaek Jang, David L. Dillman, Milan M. Jovanovic</i>	

Table of Contents

Ultra Compact Three-phase PWM Rectifier.....	761
<i>P. Karutz, S.D. Round, M.L. Heldwein, J.W. Kolar</i>	
An On-Line Stator Turn Fault Detection Method for Interior PM Synchronous Motor Drives	768
<i>Youngkook Lee, Thomas G. Habetler</i>	
PM Generator Characteristics for Oscillatory Engine Based Portable Power System	775
<i>A. Zachas, L. Wu, R.G. Harley, J. Rhett Mayor</i>	
Minimization of Rotor Position Detection Error Due to Zero-Current-Clamping Effect in Pulsating Carrier-Signal Injection-Based Sensorless Drives	781
<i>YOUNG-SU KWON, CHAN-HEE CHOI, JUL-KI SEOK</i>	
Correction on Current Measurement Errors for Accurate Flux Estimation of AC Drives at Low Stator Frequency	788
<i>KYUNG-RAE CHO, JUL-KI SEOK</i>	
Novel Low-Cost Microstepping Driving Technique with Digital Current Estimation	794
<i>A. Pizzutelli, S. Saggini, M. Ghioni</i>	
Rapid Control Prototyping of a Permanent Magnet DC Motor Drive System using dSPACE and Mathworks Simulink	799
<i>Kala Meah, Steven Hietpas, S. Ula</i>	
Minimum Phase Response in Digitally Controlled Boost and Flyback Converters.....	805
<i>Vahid Yousefzadeh, Mariko Shirazi, Dragan Maksimovic</i>	
High Resolution Digital Duty Cycle Modulation Schemes for Voltage Regulators	811
<i>Jian Li, Yang Qiu, Yi Sun, Bin Huang, Ming Xu, Dong S. Ha, Fred C. Lee</i>	
FPGA based Digital Pulse Width Modulator with Time Resolution under 2 ns.....	817
<i>Santa C. Huerta, A. de Castro, O. Garcia, J.A. Cobos</i>	
Continuous-Time Digital Signal Processing Based Controller for High-Frequency DC-DC Converters.....	822
<i>Zhenyu Zhao, Vadim Smolyakov, Aleksandar Prodic</i>	
Time Domain Design of Digital Compensators for PWM DC-DC Converters	827
<i>Mor Mordechai Peretz, Sam Ben-Yaakov</i>	
Digital Predictive Feed-Forward Controller for a DC-DC Converter in Plasma Display Panel.....	834
<i>S. Y. Chae, B.C. Hyun, P. Agarwal, W. S. Kim, B. H. Cho</i>	
Direct PWM Synchronization Using an All Digital Phase-Locked Loop for High Power Grid-Interfacing Converters	839
<i>Dewei Xu, Yun Wei Li, Bin Wu</i>	
Leakage Current Evaluation of a Single-Phase Transformerless PV Inverter Connected to the Grid	845
<i>Oscar Lopez, Remus Teodorescu, Francisco Freijedo, Jesus Doval-Gandoy</i>	
Fast Transient Control for Three-Phase Capacitor-Supported Dynamic Voltage Restorer (DVR)	851
<i>Carl N.M. Ho, Henry S.H. Chung</i>	
Common Mode Noise Reduction for Power Converters with Parasitic Capacitance Cancellation	858
<i>Shuo Wang, Fred C. Lee</i>	
Common Mode EMI Noise Suppression in Bridgeless Boost PFC Converter.....	864
<i>Pengju Kong, Shuo Wang, Fred C. Lee</i>	
Designing Common-Mode (CM) EMI Noise Cancellation Without Y-Capacitor.....	871
<i>Jin-ho Choi, Majid Madafshar, Kevin Parmenter</i>	
A New ZVS Bidirectional DC-DC Converter with Phase-Shift Plus PWM Control Scheme	876
<i>Huaifeng Xiao, Liang Guo, Shaojun Xie</i>	
Zero-Voltage-Switching PWM Three-Level Converter with Interleaved Complementary Modulation	882
<i>Wu Chen, Xinbo Ruan, Rongrong Zhang</i>	

Table of Contents

1MHz-1kW LLC Resonant Converter with Integrated Magnetics.....	888
<i>Yanjun Zhang, Dehong Xu, Kazuaki Mino, Kiyoshi Sasagawa</i>	
A 700kHz High-Efficiency High-Power-Density Three-Level Parallel Resonant DC-DC Converter for High-Voltage Charging Applications.....	895
<i>Dianbo Fu, Yang Qiu, Yi Sun, Fred C. Lee</i>	
Phase-Shifted Full Bridge DC-DC Converter with Energy Recovery Clamp and Reduced Circulating Current	902
<i>Milan Ilic, Dragan Maksimovic</i>	
Design of High Power Density LLC Resonant Converter with Extra Wide Input Range	909
<i>Yu Fang, Dehong Xu, Yanjan Zhang, Fengchuan Gao, Lihong Zhu</i>	
Design Considerations of Compensation Topologies in ICPT System	915
<i>Wenqi Zhou, Hao Ma</i>	
Improvement in Efficiency of the Phase-Shift Current-Doubler-Rectification ZVS Full-Bridge DC-DC Converter.....	921
<i>K. I. Hwu, Y. T. Yau, Tim-Ho Chen</i>	
200°C Operation of a DC-DC Converter with SiC Power Devices.....	928
<i>Biswajit Ray, Hiroyuki Kosai, James D. Scofield, Brett Jordan</i>	
Synchronous Rectification LLC Series-Resonant Converter.....	933
<i>Guan-Chyun Hsieh, Cheng-Yuan Tsai, Wei-Li Hsu</i>	
Multiphase Isolated DC-DC Converters for Low-Voltage High-Power Fuel Cell Applications.....	940
<i>Seung-Ryul Moon, Jih-Sheng Lai</i>	
Self-Balanced Input-Series Two-Stage DC-DC Converter and Ripple Match Design	947
<i>Ting Qian, Brad Lehman</i>	
Novel Concepts for Integrating the Electric Drive and Auxiliary De-Dc Converter for Hybrid Vehicles.....	953
<i>H. Plesko, J. Biela, J. Luomi, J. W. Kolar</i>	
System Integration and Power Flow Management for a Series Hybrid Electric Vehicle Using Super-Capacitors and Batteries.....	960
<i>Hyunjae Yoo, Seung-Ki Sul, Yongho Park, Jongchan Jeong</i>	
Zero-Voltage Switched Multi-Phase Converter Utilizing Nonlinear and Coupled Inductors	966
<i>M. Stadler, J. Pforr</i>	
A Bidirectional, Triple-Voltage DC-DC Converter for Hybrid and Fuel Cell Vehicle Power Systems	971
<i>Gui-Jia Su, Lixin Tang</i>	
Super Barrier Rectifier - A New Generation of Power Diode.....	978
<i>V. Rodov, A. L. Ankoudinov, Taufik</i>	
Real-Time Condition Monitoring of the Electrolytic Capacitors for Power Electronics Applications.....	982
<i>Afroz M. Imam, Deepak M. Divan, Ronald G. Harley, Thomas G. Habetler</i>	
EI Core Inductor Designs Using Population-Based Design Algorithms	987
<i>J. Cale, S.D. Sudhoff</i>	
Control Strategy for Fault-Tolerant Cascaded Multilevel Converter Based STATCOM	995
<i>Wencho Song, Alex Q. Huang</i>	
High Power Motor Drives Based on Hybrid Multilevel Converters and Direct Torque Control.....	999
<i>Shuai Lu, Keith Corzine</i>	
Solving the SHEPWM Nonlinear Equations for Three-Level Voltage Inverter Based on Computed Initial Values.....	1006
<i>Wanmin Fei, Yanli Zhang, Xinbo Ruan</i>	

Table of Contents

PWM Method of a Three-Level Neutral-Point-Clamped Converter Under Neutral Point Imbalance Condition	1011
<i>Jang-Hwan Kim, Seung-Ki Sul</i>	
Dynamic Equivalent Circuit Design in Three-level High Voltage Inverters Based on Functional Model of IGCT	1017
<i>Hua Bai, Zhengming Zhao</i>	
High Performance Control of Three-Phase Three-Level Rectifier Under Unbalanced Conditions	1024
<i>Olorunfemi Ojo, Srikanth Konduru</i>	
A Novel SPWM Method with Voltage Balancing Capability for Multilevel Rectifier/Inverter Systems	1031
<i>Zhiguo Pan, Fang Z. Peng</i>	
Commercial Frequency AC to High Frequency AC Converter with Boost-Active Clamp Bridge Single Stage ZVS-PWM Inverter	1038
<i>B. Saha, H. Sugimura, T. Okude, H. Omori, H. W. Lee, M. Nakaoka</i>	
Droop Control Method with Virtual Output Impedance for Parallel Operation of Uninterruptible Power Supply Systems in a Microgrid	1045
<i>Josep M. Guerrero, Néstor Berbel, José Matas, Jorge L. Sosa, Luis García de Vicuña</i>	
Dual 1.5-MHz 3.5-kW Versatile Half-Bridge Series-Resonant Inverter Module for Inductive Load Characterization	1052
<i>D. Puyal, C. Bernal, J. M. Burdio, I. Millán, J. Acero</i>	
High-Performance Programmable AC Signal Power Amplifier Using DSP-Based Discrete-Time Sliding Mode Control Technique	1059
<i>Fei Xu, Hao Ma</i>	
A PID Control Strategy for DC-Link Boost Voltage in Z-Source Inverter	1064
<i>Xinping Ding, Zhaoming Qian, Shuitao Yang, Bin Cui, Fangzheng Peng</i>	
High-Speed Flywheel and Motor Drive Operation for Energy Recovery in a Mobile Gantry Crane	1068
<i>M. M. Flynn, P. McMullen, O. Solis</i>	
Kinetic Energy Storage for High Reliability Power Supply Back-up	1075
<i>Alex Kyriakopoulos, Dara O'Sullivan, John G. Hayes, James Griffiths, Michael G. Egan</i>	
Development of a 350kW, 10kV Pulse Power Converter for Capacitor Charging	1081
<i>Amit K. Jain, Christopher P. Henze, Cynthia B. Henze, Karl Conroy</i>	
Optimal Design of a DC Reset Circuit for Pulse Transformers	1088
<i>D. Bortis, J. Biela, J. W. Kolar</i>	
Sustainable Power Management for Mobile Computing	1095
<i>Ali Muhtaroglu, Annette von Jouanne</i>	
Configuring Systems for Operation from Three Phase AC Power	1100
<i>Robert V. White, Andreas Stiedl</i>	
Data Communications Issues for Power System Management	1105
<i>Robert V. White, Dave Freeman</i>	
Impedance Interaction and EMI Attenuation in Converters with an Integrated Transmission-Line Filter	1117
<i>Andrew C. Baisden, Dushan Boroyevich, Jacobus Daniel van Wyk</i>	
Study on the Radiation Emissions of the Digital PCB	1123
<i>Limin Feng, Wei Chen, Henglin Chen, Zhaoming Qian</i>	
A New Approach to Mitigate CM and DM Voltage dv/dt Value in PWM Inverter Drive Motor Systems	1126
<i>Gao Qiang, Xu Dianguo</i>	
Parametric Characterization of Differential-Mode Transmission Line EMI Filter	1131
<i>Yan Liang, J. D. van Wyk, Khai Ngo</i>	

Table of Contents

A New Carrier-Based PWM for the Reduction of Common Mode Currents Applied to Neutral-Point-Clamped Inverters.....	1138
<i>A. Videt, P. Le Moigne, N. Idir, P. Baudesson, J. Ecrabey</i>	
Temperature Influence on Equivalent Impedance and Efficiency of Inductor Systems for Domestic Induction Heating Appliances	1145
<i>C. Carretero, J. Acero, R. Alonso, J. M. Burdío, F. Monterde</i>	
Long-Term Stability Test System for High-Voltage, High-Frequency SiC Power Devices.....	1152
<i>Tam H. Duong, David W. Berning, A. R. Hefner, Jr., Keyue M. Smedley</i>	
A Model of Losses in Twisted-Multistranded Wires for Planar Windings Used in Domestic Induction Heating Appliances.....	1159
<i>J. Acero, R. Alonso, J.M. Burdío, L.A. Barragán, C. Carretero</i>	
Optimizing 1200V IGBT Modules for High Frequency Applications.....	1166
<i>Eric R. Motto, John F. Donlon, Yoshikatsu Nagashima</i>	
Design Considerations for High Power Inductors in DC-DC Converters	1170
<i>T. E. Salem, D. P. Urciuoli, V. Lubomirsky, G. K. Ovrebo</i>	
High Breakdown Voltage and Low Specific On-resistance C-doped GaN-on-sapphire HFETs for Low-loss and High-power Switching Applications	1176
<i>Y. C. Choi, M. Pophristic, M. G. Spencer, L. F. Eastman</i>	
Performance Evaluation of SiC MOSFET/BJT/Schottky Diode in a 1MHz Single Phase PFC	1180
<i>Xiaojun Xu, Alex Q. Huang, Yan Gao, Anant Agarwal, Sumi Krishnaswami, Sei-Hyang Ryu, Xu Huang</i>	
A Novel Self-Powered Supply for GCT Gate Drivers.....	1185
<i>W. Hu, B. Wu, N. Zargari, Z. Cheng</i>	
Arc Stability Criteria in AC Arc Furnace and Optimal Converter Topologies.....	1190
<i>Yongjoong Lee, Henrik Nordborg, Yongsug Suh, Peter Steimer</i>	
Frequency Tracking Control for a Capacitor-Charging Parallel Resonant Converter with Phase-Locked Loop	1197
<i>H. Sheng, Y. Pei, X. Yang, F. Wang, C. W. Tipton</i>	
Improved Performance of Half-Bridge Series Resonant Inverter for Induction Heating with Discontinuous Mode Control	1203
<i>I. Millán, D. Puyal, J. M. Burdío, C. Bernal, J. Acero</i>	
New Power Conditioning System for Battery-free Satellite Buses with Maximum Power Point Tracking.....	1209
<i>E. Maset, E. Sanchis-Kilders, J. B. Ejea, A. Ferreres, J. M. Blanes, A. Garrigós, J. A. Carrasco, A. H. Weinberg</i>	
A Novel Single-Stage Dimmable Electronic Ballast with High Efficiency and Unity Power Factor Using an Integrated Buck-boost Current Source Resonant Inverter.....	1216
<i>J. Lam, Praveen K. Jain</i>	
Solving High-Voltage Off-Line HB-LED Constant-Current Control-Circuit Issues	1223
<i>Giovanni Carraro</i>	
Power Driver Topologies and Control Schemes for LEDs.....	1226
<i>Heinz van der Broeck, Georg Sauerländer, Matthias Wendt</i>	
Simulation Modeling and Experimental Validation of Generator Control Strategy in DFIG System	1233
<i>Seung-Ho Song, Ji-Hoon Im, Hyeong-Jin Choi, Seung-Gi Jeong, Byoung-Chang Jeong</i>	
Development of a Variable-Speed Wind Energy Conversion System based on Doubly-Fed Induction Generator	1238
<i>S. Y. YANG, X. ZHANG, C. W. ZHANG, L. CHANG</i>	
Design and Implementation of A Novel Average Current Mode PFC Controller IC.....	1243
<i>Ning Zhu, Hongtao Mu, Xiaojun Xu, Alex Q. Huang</i>	
Integrated Circuits of a PFC Controller for Interleaved Critical-Mode Boost Converters.....	1249
<i>T.F. Wu, J.R. Tsai, Y.M. Chen, Z.H. Tsai</i>	

Table of Contents

Efficiency and EMI Analysis for a ZVS-SVM Controlled Three-Phase Boost PFC Converter	1253
<i>Rui Li , Dehong Xu , Bo Feng, Kazuaki Mino, Hidetoshi Umida</i>	
Programmable PFC Based Hybrid Multipulse Power Rectifier with Sinusoidal Input Line Current Imposed by Digital Controller	1258
<i>L. C. Gomes de Freitas, F. Vincenzi, M. A. A. Freitas, E. R. Fernandes, R. G. Mendonça, L. C. de Freitas</i>	
Research on Three-Phase High Power Factor Correction Based on Predictive Current Controller.....	1264
<i>Yu Fang, Xun Qiu, Yan Xing, Yuwen Hu</i>	
A Novel Solid-State Bridge Type FCL for Three-Phase Three-Wire Power Systems	1268
<i>Wanmin Fei, Yanli Zhang, Zhaojuan Meng</i>	
Simplified Voltage Notch Filler for Interactive Uninterruptible Power Supplies.....	1272
<i>M. Arias, A. Fernández, D. G. Lamar, M. Rodríguez, M.M. Hernando</i>	
Analysis and Optimization of Active Frequency Drift Islanding Detection Method	1278
<i>Furong Liu, Yong Kang, Shanxu Duan</i>	
Communicationless Parallel Inverters Based on Inductor Current Feedback Control	1284
<i>Hongxin Ju, Ming Ding, Jianhui Su, Yan Du, Liuchen Chang</i>	
PWM Inverter Harmonics Contributions to the Inverter-Fed Induction Machine Bearing Fault Diagnosis.....	1289
<i>Bilal Akin, Hamid A. Toliyat, Umut Orguner, Mark Rayner</i>	
BLDC Motor Control Algorithm for Low-Cost Industrial Applications	1296
<i>Namhun Kim, Hamid A. Toliyat, Issa M. Panahi, Min-Huei Kim</i>	
Parameter and Speed Estimation for Implementing Low Speed Sensorless PMSM Drive System Based on an Algebraic Method	1302
<i>R. S. Miranda, C. B. Jacobina, E. M. Fernandes, A. M. N. Lima, A. C. Oliveira, M. B. R. Correa</i>	
Investigation of IPMSM's Position Estimation in Low Speed Region with DC Link Current Detection	1307
<i>Takayuki Kobayashi, Hisao Kubota</i>	
Optimum Fault-Tolerant Control of Multi-phase Permanent Magnet Machines under Open-Circuit and Short-Circuit Faults.....	1313
<i>Suman Dwari, Leila Parsa</i>	
EMF Feedback Control Strategy of Induction Motor for Wide Speed Range.....	1319
<i>Haifeng LU, Wenlong QU, Xiaomeng CHENG, Yang FAN, Xing Zhang</i>	
Modified Direct Torque Control of Five-Phase Permanent Magnet Synchronous Motor Drives.....	1324
<i>Yuan Gao, Leila Parsa</i>	
Combined Radial-Axial Magnetic Bearing for a 1 kW, 500,000 rpm Permanent Magnet Machine.....	1330
<i>P. Imoberdorf, C. Zywyssig, S. D. Round, J.W. Kolar</i>	
PID Digital Control Using Microcontroller and FPGA Applied to a Single-Phase Three-Level Inverter	1337
<i>L. H. S. C. Barreto, P. P. Praça, C. M. T. Cruz, R. T. Bascope</i>	
Novel Digital Controller Improves Dynamic Response and Simplifies Design Process of Voltage Regulator Module	1341
<i>Eric Meyer, Guang Feng, Yan-Fei Liu</i>	
Control of a Single-Phase PFC Preregulator using an 8-bit Microcontroller	1348
<i>Yijing Chen, Dake He, R. M. Nelms</i>	
Nonlinear PID in Digital Controlled Buck Converters	1355
<i>Mingzhi He, Jianping Xu</i>	
Improved Digital Predictive Control of Switching DC-DC Converters.....	1360
<i>Mingzhi He, Jianping Xu</i>	
Multi-Level Modeling of PFC Rectifier and Dc-Dc Converter Modules in Inter-Connected Switching Power Supply Systems.....	1366
<i>Runxin Wang, Jinjun Liu, Hao Wang, Qinsan Hou</i>	

Table of Contents

Photovoltaic Maximum Power Point Tracking based on an Adjustable Matched Virtual Load	1371
<i>M. Sokolov, D. Shmilovitz</i>	
A Unified Switching Model for VSC Validated by IGCTs and IGBTs.....	1376
<i>Fan Zichao, Liu Wenhua, Song Qiang</i>	
A Novel Chaotification Control Scheme in DC-DC Converter.....	1380
<i>R.Yang, B.Zhang, Y.P.Zhang</i>	
A Diagnostic Technique for Multilevel Inverters Based on a Genetic-Algorithm to Select a Principal Component Neural Network.....	1386
<i>Surin Khomfoi, Leon M. Tolbert</i>	
A Five-Level Three-Phase Cascade Multilevel Inverter Using a Single DC Source for a PM Synchronous Motor Drive.....	1393
<i>John N. Chiasson, Burak Özpineci, Leon M. Tolbert</i>	
A Fast and Universal Neuro-Based SVM Algorithm for Multi-Level Converters.....	1397
<i>M. Saeedifard, H. Saligheh Rad, A. Bakhshai, R. Iravani</i>	
Three-Level Three-Leg Converter for Single-Phase to Single-Phase Applications	1404
<i>C. B. Jacobina, Y. C. Gomes, I. S. Freitas, E. R. C. da Silva</i>	
Switching Technique for Dual-Two Level Inverter Supplied by Two Separate Sources	1411
<i>Domenico Casadei, Gabriele Grandi, Alberto Lega, Claudio Rossi, Luca Zarri</i>	
The Pinch-Off Circuit: Reducing Noise and Component Stresses by Eliminating Body Diode Conduction in Synchronous Rectifiers	1418
<i>Dwight DeWitt, Cameron Brown, Steven Robertson</i>	
LLC DC/DC Resonant Converter with PLL Control Scheme.....	1424
<i>Ray-Lee Lin, Wei-Cheng Ju</i>	
Analysis and Design of Voltage Regulator with Adaptive FET Modulation to Improve Efficiency	1431
<i>Osama Abdel-Rahman, Jaber Abu-Qahouq, Lilly Huang, Issa Batarseh</i>	
Improvement of Transient Load Response for the ZVS Buck Converter Using FPGA-Based Control.....	1439
<i>K. I. Hwu, Y. T. Yau</i>	
Dual SmartRectifier™ and DirectFET® Chipset Overcomes Package Source Inductance Effects and Provides Accurate Sensing for Synchronous Rectification in DC-DC Resonant Converters	1446
<i>Adnaan Lokhandwala, Maurizio Salato, Marco Soldano</i>	
A Novel Saturable Reactor Reset Circuit for Optimizing Soft Switching of Resonant Reset Dual Switch Forward Converter.....	1450
<i>Wei Chen, Zhengyu Lu, Zhaoming Qian, Shaoshi Ye</i>	
Adaptive Controller with Mode Tracking and Parametric Estimation.....	1455
<i>Jaber A. Abu Qahouq, Lilly Huang</i>	
Adaptive Modulation Control for Multiple-Phase Voltage Regulators	1462
<i>Shanyang Xiao, Weihong Qiu, Greg Miller, Thomas X. Wu, Issa Batarseh</i>	
The Light Load Issue of Coupled Inductor Laptop Voltage Regulators and its Solutions	1468
<i>Yan Dong, Julu Sun, Ming Xu, Fred. C. Lee, Milan M. Jovanovic</i>	
Proposed DPWM Scheme with Improved Resolution for Switching Power Converters	1475
<i>Yang Qiu, Jian Li, Ming Xu, Dong S. Ha, Fred C. Lee</i>	
Quantification of Power MOSFET Losses in a Synchronous Buck Converter.....	1481
<i>Toni López, Reinhold Elserich</i>	
Self-Balanced Dual Interleaved Active-Clamp Forward for High Input Voltage Application.....	1488
<i>Ting Qian, Brad Lehman</i>	
A Simple Approach to Design a Contact-Less Power Supply for a Low Power Moving Load.....	1494
<i>C. Fernández, P. Zumel, A. Lázaro, A. Barrado</i>	

Table of Contents

Development of High Power DC-DC Converter for Metro Vehicle System.....	1500
<i>Honyong Cha, Qingsong Tang, Fang Z. Peng</i>	
390V Input for High Efficiency VRM for Server Power Architecture	1506
<i>Y. Liu, A. Pratt, P. Kumar, M. Xu, Fred C. Lee</i>	
A Novel Topology of Secondary LLC Series Resonant Converter.....	1512
<i>Eun-Soo Kim, Bong-Geon Chung, Sung-In Kang, In-Su Cha, Moon-Ho Kye</i>	
Analysis and Design of LLC Resonant Converter with Integrated Transformer.....	1517
<i>Hangseok Choi</i>	
Design of a Transient Voltage Clamp (TVC) Based on Output Impedance Analysis.....	1523
<i>Sungkeun Lim, Ding Li, Alex Q. Huang, Xiaojun Xu</i>	
An Ultrasonic, Electrically Isolated Channel, Over PCB.....	1526
<i>Denis Mets, Shaul Ozeri, Doron Shmilovitz</i>	
Design Considerations and Comparison Between Two High-Frequency Resonant Drivers for Synchronous Rectification MOSFETs	1531
<i>G. Spiazzini, P. Mattavelli, L. Rossetto</i>	
Operating Characteristics in LCLC Resonant Converter with a Low Coupling Transformer.....	1538
<i>Eun-Soo Kim, Hyun-Kwan Lee, Young-Su Kong, Yoon-Ho Kim</i>	
Multiple-Input Dc-Dc Converters to Enhance Local Availability in Grids Using Distributed Generation Resources.....	1544
<i>Alexis Kwasinski, Philip T. Krein</i>	
Analysis and Applications of a Current-Sourced Buck Converter	1551
<i>Wayne W. Weaver, Philip T. Krein</i>	
A Robust Repetitive Control Strategy for CVCF Inverters with Very Low Harmonic Distortion.....	1558
<i>Shuitao Yang, Bin Cui, Fan Zhang, Zhaoming Qian</i>	
Design Considerations for PDM Ac/ac Converter Implementation.....	1563
<i>Abdelhalim Sandali, Ahmed Chériti, Pierre Sicard</i>	
Class D Amplifier with Ripple Steering.....	1569
<i>Eric Mendenhall</i>	
A 2-MW Motor and ARCP Drive for High-Speed Flywheel	1575
<i>R.F. Thelen, A. Gattozzi, D. Wardell, A. Williams</i>	
DC-Link Single-Phase to Single-Phase Full-Bridge Converter Operating with Reduced AC Capacitor Voltage	1580
<i>I. S. de Freitas, C. B. Jacobina</i>	
A Current Reconstruction Scheme for Low-Cost PMSM Drives Using Shunt Resistors.....	1586
<i>S. Chi, X. Wang, Y. Yuan, Z. Zhang, L. Xu</i>	
Fault Tolerant AC-AC Single-Phase to Three-Phase DC-Link Converter.....	1592
<i>E. C. dos Santos Jr., C. B. Jacobina, M. B. R. Correa</i>	
A Comprehensive Analysis of a Three-Phase Z-Source DC-AC Converter.....	1599
<i>Gayathri Murthi, Olorunfemi Ojo</i>	
Development and Test a 260 kVA Inverter with a Passive Soft-Switching Snubber	1606
<i>Lihua Chen, Alan Joseph, Qingsong Tang, Fang Z. Peng</i>	
Experimental Analysis of a Six Phase Permanent Magnet Synchronous Generator in a Variable Speed Constant Frequency Generating System	1612
<i>E. Miliani, M.Y. Ayad, D. Depernet, J. M. Kauffmann</i>	
Transformerless Photovoltaic Inverters Connected to the Grid.....	1618
<i>T. Kerekes, R. Teodorescu, U. Borup</i>	