

VOLUME IX - TABLE OF CONTENTS

Foreword	
About the Book	
1. Voltage Regulation Modules (VRM) and DC/DC converters	
1.1 "Investigation of Candidate VRM Topology for Future Microprocessors," X. Zhou, F.C. Lee, <i>Applied Power Electronics Conference</i> , March 1998	
1.2 "VRM Transient Study and Output Filter Design for Future Processors," P. Wong, H. Wu, J. Chen, X. Zhou, J. Liu, X. Zhang, L. Amoroso, <i>VPEC Seminar</i> , September 1997.....	
1.3 "A High Power Density, High Efficiency and Fast Transient Voltage Regulator Module with a Novel Current Sensing and Current Sharing Technique," X. Zhou, P. Xu, and F. C. Lee, <i>Applied Power Electronics Conference</i> , March 1999.....	
1.4 "A Novel High-Input-Voltage, High Efficiency and Fast Transient Voltage Regulator Module---Push-Pull Forward Converter," X. Zhou, Bo Yang, L. Amoroso, F. C. Lee, and P. Wong, <i>Applied Power Electronics Conference</i> , March 1999.....	
1.5 "Low Voltage Power Devices for Future VRM," Alex Q. Huang, Nick X. Sun, Bo Zhang, Xunwei Zhou and F.C. Lee, <i>International Symposium on Power Semiconductor Devices and ICs</i> , 1998.....	
1.6 "The Impact of Voltage Scaling on Power MOSFET Performance in Future VRM," N. Sun, A. Huang, B. Zhang, X. Zhou, and F.C. Lee, <i>VPEC Seminar</i> , September 1998.....	
1.7 "An 0.35- μm , 6-m Ω , 43 $\mu\Omega\text{-cm}^2$ Lateral Power MOSFET for Low-Voltage, Megahertz Switching Power Applications," N. Sun and A. Huang, <i>IEEE Electron Device Letters</i> , VOL. 20, NO. 7, July 1999.....	
1.8 "Improve Light Load Efficiency for Synchronous Rectifier Buck Converter," X. Zhou, M. Donati, L. Amoroso, and F.C. Lee, <i>VPEC Seminar</i> , September 1998.....	
1.9 "Integrated Planar Inductor Scheme for Multi-Module Interleaved Quasi-Square Wave (QSW) DC/DC Converter," W. Chen, F.C. Lee, X. Zhou, and P. Xu, <i>VPEC Seminar</i> , September 1998.....	
1.10 "Fast VRM with High Input Voltage," P. Wong, X. Zhou, B. Yang, and F. C. Lee, <i>VPEC Seminar</i> , September 1998.....	
1.11 "Single-Shot Transient Suppressor (SSTS) for High Current High Slew Rate Microprocessor," L. Amoroso, M. Donati, X. Zhou and F. Lee, <i>Applied Power Electronics Conference</i> , March 1999.....	
1.12 "Commutation Analysis of Self-Driven Synchronous Rectifiers in an Active-Clamp Forward Converter," Michael T. Zhang and Fred C. Lee, <i>Power Electronics Specialist Conference</i> , June 1996.....	
1.13 "Design Considerations and Performance Evaluations of Synchronous Rectification in Flyback Converters," Michael T. Zhang, Milan M. Jovanovic, and Fred C. Lee, <i>IEEE Trans. on Power Electronics</i> , Vol. 13, No. 3, May 1998.....	
1.14 "Optimizing Design for Low Voltage DC-DC Converter," Xunwei Zhou, T. Wang, and Fred C. Lee, <i>Applied Power Electronics Conference</i> , March 1997	

- 1.15 **"Design of High Efficiency, Low Profile, Low Voltage Converter with Integrated Magnetics,"** W. Chen, G. Hua, D. Sable, and F.C. Lee, *VPEC Seminar*, September 1997.....
- 1.16 **"Large-Signal Transient Analysis of Forward Converter with Active-Clamp Reset,"** Qiong Li, M. Jovanovic and F.C. Lee, *Power Electronics Specialist Conference*, June 1998.....
- 1.17 **"Using Simulation for Design Verification of Bias Power Supply in a DC/DC Converter System,"** Q. Li, F. C. Lee, and T. Wilson, Jr., *VPEC Seminar*, September 1998.....
- 1.18 **"Design Considerations of Transformer DC Bias of Forward Converter with Active-Clamp Reset,"** Qiong Li, Fred C. Lee, and Milan M. Jovanovic, *Applied Power Electronics Conference*, March 1999.....
- 1.19 **"Design of a High Frequency Switching Amplifier for Smart Material Actuators with Improved Current Mode Control,"** J. Luan and F. C. Lee, *Power Electronics Specialist Conference*, June 1998.....
- 1.20 **"Single-Switch Soft-Switching Flyback Converter,"** J.B. Lio, M.S. Lin, D. Y. Chen, and W. S. Feng, *Electronics Letters*, August 1, 1996, Vol. 32, No. 16.....
- 1.21 **"Leading-edge Modulation Voltage-mode Control with Flux Unbalance Correction for Push-pull Converter,"** Xingsheng Zhou, Dan Chen, and Clifford Jamerson, *CPES Seminar 1999*.....
- 1.22 **"Design of an ASIC Control Chip for a Forward Active-Clamp Converter,"** W. Dong and A. Huang, *VPEC Seminar*, September 1997.....
- 1.23 **"A Novel Integrated Current Doubler Rectifier,"** P.Xu, Q. Wu, P. Wong and F.C.Lee, *CPES Seminar*, September 1999.....

2. Single-Phase Power Factor Correction and Electrical Ballast

- 2.1 **"Review of Power Factor Correction Techniques,"** H. Mao, Fred C. Lee, Y. Jiang, and D. Borojevic, *IPEMC'97*, November, 1997.....
- 2.2 **"An Improved 'Charge Pump' Electronic Ballast with Low THD and Low Crest Factor,"** Wei Chen and Fred C. Lee, *IEEE Trans. on Power Electronics, Volume 12, No. 5*, September 1997,.....
- 2.3 **"Investigation of Charge-Pump-Controlled High Power Factor Correction AC-DC Converters,"** Jinrong Qian and Fred C. Lee, *VPEC Seminar*, September 1996.....
- 2.4 **"Analysis, Design and Experiments of a High Power Factor Electronic Ballast,"** Jinrong Qian, Fred C. Lee, Tokushi Yamauchi, *Applied Power Electronics Conference*, March 1997.....
- 2.5 **"Current Source Charge Pump Power Factor Correction Electronic Ballast,"** Jinrong Qian, Fred C. Lee and T. Yamauchi, *Power Electronics Specialist Conference*, June, 1997.....
- 2.6 **"Charge Pump High Power Factor Dimming Electronic Ballast,"** Jinrong Qian, Fred C. Lee, Tokushi Yamauchi, *Power Electronics Specialist Conference*, June, 1997.....
- 2.7 **"A New Continuous Input Current Charge Pump Power Factor Correction (CIC-CPPFC) Electronic Ballast,"** J. Qian, F. C. Lee, T. Yamauchi, *IEEE Trans. on Power Electronics, Vol. 13, No. 3*, May 1998.....
- 2.8 **"A Single-Stage Electronic Ballast with Power Factor Correction and Low Crest Factor for Fluorescent Lamps,"** J. Qian, F.C. Lee, and T. Yamauchi, *VPEC Seminar*, September 1997.....

- 2.9 **"New Charge Pump Power Factor Correction Electronic Ballast with a Wide Range of Line Input Voltage,"** Jinrong Qian and Fred C. Lee, *Applied Power Electronics Conference*, March 1998.....
- 2.10 **"A Comparative Study of a Family of Charge Pump Power Factor Correction Electronic Ballasts,"** F. Tao, J. Qian, F. C. Lee, and N. Onishi, *VPEC Seminar*, September 1998.....
- 2.11 **"A Self-oscillating Drive for Single-Stage Charge-Pump Power-Factor-Correction Electronic Ballast,"** Fengfeng Tao, Fred C. Lee, and Naoki Onishi, *CPES Seminar*, September 1999.....
- 2.12 **"A Critical-Conduction-Mode Single-Stage Power-Factor-Correction Electronic Ballast,"** Fengfeng Tao and Fred C. Lee, *CPES Seminar*, September 1999.....
- 2.13 **"An Interleaved Single-Stage Power-Factor-Correction Electronic Ballast,"** F. Tao and F.C. Lee, *CPES Seminar*, September 1999.....
- 2.14 **"Optimization of Combined Voltage-Source-Current-Source Charge-Pump Power-Factor-Correction Electronic Ballast,"** Fengfeng Tao, Fred C. Lee, and Naoki Onishi, *CPES Seminar*, September 1999.....
- 2.15 **"A Cost-Effective High-Power Density Electronic Ballast For Automotive HID Lamps,"** Anna Pasquini, Fred C. Lee, and Alberto Reatti, *CPES Seminar*, September 1999.....
- 2.16 **"An Equivalent Circuit Model of Radial Vibration Mode Piezoelectric Transformers,"** Ray L. Lin, Pit-Leong Wong, and Fred C. Lee, *CPES Seminar*, September 1999.....
- 2.17 **"Characterization of Piezoelectric Transformers,"** Ray L. Lin, Fred C. Lee, and Eric Baker, *CPES Seminar*, September 1999.....
- 2.18 **"High-Voltage Applications of Piezoelectric Transformers,"** C.Y. Lin and Fred C. Lee, *VPEC Seminar*, September 1996.....
- 2.19 **"Primary-Side Dimming Control Driver for Cold-Cathode Fluorescent Lamps,"** Mu-Shen Lin, Jan-Bin Lio, Dan Y. Chen and Wu-Shiung Feng, *Electronics Letters*, Vol. 32, No. 15, July 18, 1996.....
- 2.20 **"Synchronous Dimming Control for a Cold-Cathode Fluorescent Lamp Driver,"** M.S. Lin, M.C. Lee, D. Y. Chen, and W.S. Feng, *Electronics Letters*, Vol. 32, No. 13, June 20, 1996.....
- 2.21 **"A Novel High Power Factor Correction Rectifier with a Coupling Inductor,"** Jinrong Qian and Fred C. Lee, *VPEC Seminar*, September 1996.....
- 2.22 **"A High Efficient Single Stage Single Switch High Power Factor AC/DC Converter with Universal Input,"** Jinrong Qian and Fred C. Lee, *Applied Power Electronics Conference*, March 1997.....
- 2.23 **"Single-Stage Single-Switch Power Factor Correction (S⁴-PFC) AC/DC Converters with DC Bus Voltage Feedback for Universal Line Applications,"** J. Qian, Q. Zhao, and F.C. Lee, *VPEC Seminar*, September 1997.....
- 2.24 **"Design Optimization of an Off-Line Input Harmonic Current Corrected Flyback Converter,"** Q. Zhao, F. C. Lee, and F. Tsai, *VPEC Seminar*, September 1998.....
- 2.25 **"General Studies on Single-Stage Power-Factor-Correction Techniques,"** Jindong Zhang, Alex Uan-Zo-li, Fred C. Lee, and Milan M. Jovanovic, *CPES Seminar*, September 1999.....

- 2.26 **“Study and Analysis of a High-Frequency Current-Source Single-Stage Power-Factor-Correction Converter,”** Jindong Zhang, Fred C. Lee, and Milan M. Jovanovic, *CPES Seminar* 1999.....
- 2.27 **“An Improved CCM Single-Stage PFC Converter with Auxiliary Switch,”** J. Zhang, F. C. Lee, and M. Jovanovic, *Applied Power Electronics Conference*, March 1999.....
- 2.28 **“Comparison Between CCM-Single-Stage PFC and Two-Stage Boost PFC Converters,”** J. Zhang, M. Jovanovic, and F. C. Lee, *Applied Power Electronics Conference*, March 1999.....
- 2.29 **“Single-Stage Input-Current-Shaping Technique with Voltage-Doubler-Rectifier Front End,”** Jindong Zhang, Laszlo Huber, Milan M. Jovanovic, and Fred C. Lee, *Applied Power Electronics Conference*, March 1999
- 2.30 **“Single Magnetic, Unity Power Factor, Isolated Power Converter with Ripple Free Input Current,”** Wei Chen and Fred C. Lee, *Power Electronics Specialist Conference*, June 1998
- 2.31 **“A Generalized Technique for Derivation of Linear Average Current Mode Control Laws for Power Factor Correction without Input Voltage Sensing,”** Jay Rajagopalan and Fred C. Lee, *Applied Power Electronics Conference*, March 1999
- 2.32 **“A Novel Control Method for BOOST PFC Converter in CCM Condition,”** Kaiwei Yao, Jianwen Shao, and Fred C. Lee, *CPES Seminar*, September 1999.....
- 2.33 **“Design of a Power Factor Correction Circuit with Wide Output Voltage Range,”** Y. Zhao, C.Y. Lin, X. Zhuang and F.C. Lee, *VPEC Seminar*, September 1997.....
- 2.34 **“Comparison of High-Frequency Application of Silicon Rectifiers, GaAs Rectifier, and ZVT Technology in a PFC Boost Converter,”** X. Zhou, M. Elmore and F.C. Lee, *Power Electronics Specialist Conference*, June 1997.....

3. Distributed Power Systems

- 3.1 **“High-Frequency AC Distributed Power Systems, Part I: Conceptual Overview and Topology Considerations,”** Robert Watson and Fred C. Lee, *CPES Seminar*, September 1999.....
- 3.2 **“High-Frequency AC Distributed Power Systems, Part II: System Noise and Distribution Issues,”** Robert Watson and Fred C. Lee, *CPES Seminar*, September 1999.....
- 3.3 **“High-Frequency AC Distributed Power Systems, Part III: DC and AC Distributed Power System Comparison,”** Robert Watson and Fred Lee, *CPES Seminar*, September 1999.....
- 3.4 **“Characterization and Analysis of Electromagnetic Interference in a High Frequency AC Distributed Power System,”** Michael Zhang, Robert Watson, Fred C. Lee, James Roudet, Jean-Luc Shanen, and Edith Clavel, *Applied Power Electronics Conference*, March 1997
- 3.5 **“Modeling and Stability Analysis of a DC Power System with Solid State Power Controllers,”** Y.V. Panov and F.C. Lee, *Applied Power Electronics Conference*, March 1996
- 3.6 **“Stability of Large DC Power Systems Using Switching Converters, With Application to the International Space Station,”** E.W. Gholdston, K. Karimi, F.C. Lee, J. Rajagopalan, Y. Panov, B. Manners, *31st Intersociety Energy Conversion Engineering Conference*, August 1996.....
- 3.7 **“Analysis and Design of N Paralleled DC-DC Converters with MS Current-Sharing Control,”**

- Yuri Panov, Jay Rajagopalan, and Fred C. Lee, *Applied Power Electronics Conference*, March 1997...
- 3.8 “**A Classification and Evaluation of Paralleling Methods for Power Supply Modules**,” S. Luo, Z. Ye, R. Lin, and F. C. Lee, *VPEC Seminar*, September 1998.....
- 3.9 “**Multiple Levels of Complexity in Modeling and Simulation Power Supply Subsystems**,” Q. Li, J. Waite, R. Hodkiewicz, T. G. Wilson Jr. and F. C. Lee, *VPEC Seminar*, September 1997.....
- 3.10 “**Stability Study of PC Power System**,” Pit-Leong Wong, Fred C. Lee, and Xunwei Zhou, *CPES Seminar 1999*.....
- 3.11 “**Optimized Design of Power Distribution Systems for Next Generation Aircraft**,” Sriram Chandrasekaran, Konstantin Louganski, Scott Ragon and, and Z. Gürdal, *CPES Seminar 1999*.....
- 3.12 “**System Stability Analysis Based On Three-Dimensional Forbidden Region**,” Yuhui Chen, Xiaogang Feng, and Fred C. Lee, *CPES Seminar 1999*.....

4. Magnetic

- 4.1 “**Characterization and Analysis of Parasitic Parameters and their Effects in Power Electronics Circuit**,” Ning Dai and Fred C. Lee, *Power Electronics Specialist Conference*, June 1996.....
- 4.2 “**Characterization of Dimensional Resonance Effects in Ferrite-Core Magnetic Devices**,” G. Skutt and Fred C. Lee, *Power Electronics Specialist Conference*, June 1996.....
- 4.3 “**Measurement Issues in the Characterization of Ferrite Magnetic Material**,” Glenn Skutt, Fred C. Lee, and John G. Breslin, *VPEC Seminar*, September 1996.....
- 4.4 “**Phase Error Compensation Method for Measurement of Low-power-factor High-frequency Inductors**,” W. Chen, L. Ye, D. Y. Chen, and F.C. Lee, *Applied Power Electronics Conference*, March 1998
- 4.5 “**Improved Winding Design for Planar Inductors**,” Liming Ye, Glenn R. Skutt, Ronald Wolf, and Fred C. Lee, *Power Electronics Specialist Conference*, June 1997
- 4.6 “**Applications of Half-Turn on E-Core in Switching Power Supplies**,” X. Zhou, C. Jamerson, and D. Chen, *VPEC Seminar*, September 1998

5. Thermal and EMI of Switching Power Supplies

- 5.1 “**Design and Analysis of Thermal Management for High-Power-Density Converters in Sealed Enclosures**,” Michael T. Zhang, Milan M. Jovanovic, and Fred C. Lee, *Applied Power Electronics Conference*, March 1997
- 5.2 “**Integrated EMI/Thermal Design for Switching Power Supplies**,” W. Zhang, F. C. Lee, and D. Chen, *VPEC Seminar*, September 1998
- 5.3 “**An Experimental Comparison of Conducted EMI Emissions Between Zero-Voltage Transition Circuit and a Hard-Switching Circuit**,” Dongbing Zhang, Dan Y. Chen and Fred C. Lee, *Power Electronics Specialist Conference*, June 1996
- 5.4 “**Conducted EMI Analysis of a Boost PFC Circuit**,” Wei Zhang, Michael T. Zhang, Fred C. Lee, James Roudet and Edith Clavel, *Applied Power Electronics Conference*, March 1997
- 5.5 “**A New Method to Characterize EMI Filters**,” Dongbing Zhang, Dan Y. Chen, and Dan Sable,

	<i>Applied Power Electronics Conference, March 1998</i>
5.6	"A Procedure for Designing EMI Filters for Ac Line Applications," Fu-Yuan Shih, Dan Y. Chen, Yan-Pei Wu, and Yie-Tone Chen, <i>IEEE Transactions on Power Electronics, Vol. 11, No. 1</i> , January, 1996.....
5.7	"Non-Intrinsic Differential Mode Noise Caused by Ground Current in an Off-Line Power Supply," D. Zhang, D. Chen, and F.C. Lee, <i>VPEC Seminar</i> , September 1997.....
5.8	"Measurement of Noise Source Impedance of Off-Line Converters," Dongbing Zhang, Dan Y. Chen, Mark J. Nave, and Dan Sable, <i>Applied Power Electronics Conference, March 1998</i>
5.9	"Mixed-Mode EMI Noise and Its Implications for Filter Design in Offline Switching Power Supplies," Song Qu and Dan Y. Chen, <i>CPES Seminar</i> , March 1999.....
	Editor's Biography
	Author Index