

IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS

A PUBLICATION OF THE IEEE INDUSTRIAL ELECTRONICS SOCIETY

JULY 2011

VOLUME 58

NUMBER 7

ITIED6

(ISSN 0278-0046)

SPECIAL SECTION ON ELECTRONIC DEVICES AND SYSTEMS IN HARSH ENVIRONMENTS

- Guest Editorial R. N. Dean, P. Lall, M. Nowotnick, and W. R. Harrell 2579

SPECIAL SECTION PAPERS

SiC Schottky Diodes for Harsh Environment Space Applications P. Godignon, X. Jordà, M. Vellvehi, X. Perpiñà, V. Banu, D. López, J. Barbero, P. Brosselard, and S. Massetti	2582
A Characterization of the Performance of a MEMS Gyroscope in Acoustically Harsh Environments R. N. Dean, S. T. Castro, G. T. Flowers, G. Roth, A. Ahmed, A. S. Hodel, B. E. Grantham, D. A. Bittle, and J. P. Brunsch, Jr.	2591
Strong and Weak Electric Field Interfering: Capacitive Icing Detection and Capacitive Energy Harvesting on a 220-kV High-Voltage Overhead Power Line M. J. Moser, T. Bretterklieber, H. Zangl, and G. Brasseur	2597
Prognostication of Residual Life and Latent Damage Assessment in Lead-Free Electronics Under Thermomechanical Loads P. Lall, C. Bhat, M. Hande, V. More, R. Vaidya, and K. Goebel	2605
A Low-Cost Solution for Deploying Processor Cores in Harsh Environments M. Violante, C. Meinhardt, R. Reis, and M. Sonza Reorda	2617
Evaluation of the Hardware for a Mobile Measurement Station B. Dziadak and A. Michalski	2627
Robust BME Class-I MLCCs for Harsh-Environment Applications X. Xu, A. S. Gurav, P. M. Lessner, and C. A. Randall	2636
Analysis and Control of Nonsalient Permanent Magnet Axial Gap Self-Bearing Motor Q. D. Nguyen and S. Ueno	2644
Industrial Fieldbus Improvements in Power Distribution and Conducted Noise Immunity With No Extra Costs A. Menéndez, A. Barbancho, E. Personal, and D. F. Larios	2653
Long-Term Reliability of Railway Power Inverters Cooled by Heat-Pipe-Based Systems X. Perpiñà, X. Jordà, M. Vellvehi, J. Rebollo, and M. Mermet-Guyennet	2662
Packaging Technology for Electronic Applications in Harsh High-Temperature Environments P. Hagler, P. Henson, and R. W. Johnson	2673
Reliability Estimation of Three Single-Phase Topologies in Grid-Connected PV Systems F. Chan and H. Calleja	2683
Fully Integrated High-Isolation Low-Loss Digitally Controlled MEMS Filters K. Ma, R. M. Jayasuriya, and D. R. Lim Chin Siong	2690
Electrical Noise in MEMS Capacitive Elements Resulting From Environmental Mechanical Vibrations in Harsh Environments R. N. Dean, A. Anderson, S. J. Reeves, G. T. Flowers, and A. S. Hodel	2697
Analysis of Clamped Inductive Turnoff Failure in Railway Traction IGBT Power Modules Under Overload Conditions X. Perpiñà, J.-F. Serviere, J. Urresti-Ibañez, I. Cortés, X. Jordà, S. Hidalgo, J. Rebollo, and M. Mermet-Guyennet	2706

(Contents Continued on Page 2577)

请阅后放回:

排架号 E194 处



Design and Test of an HV-CMOS Intelligent Power Switch With Integrated Protections and Self-Diagnostic for Harsh Automotive Applications	2715
<i>N. Costantino, R. Serventi, F. Tinfena, P. D'Abramo, P. Chassard, P. Tisserand, S. Saponara, and L. Fanucci</i>	
A Smart Skin PVC Foil Based on FBG Sensors for Monitoring Strain and Temperature	2728
<i>A. Ferreira da Silva, A. F. Gonçalves, L. A. de Almeida Ferreira, F. M. M. Araújo, P. M. Mendes, and J. H. Correia</i>	
ESD-Protected Power Amplifier Design in CMOS for Highly Reliable RF ICs	2736
<i>X. Wang, X. Guan, S. Fan, H. Tang, H. Zhao, L. Lin, Q. Fang, J. Liu, A. Wang, and L. Yang</i>	
<hr/>	
PAPERS	
<i>Multiphase Systems</i>	
Low-Speed Control Improvements for a Two-Level Five-Phase Inverter-Fed Induction Machine Using Classic Direct Torque Control	2744
<i>L. Gao, J. E. Fletcher, and L. Zheng</i>	
Applying Differential-Mode Transformer to Current Sharing With Current Ripple Considered	2755
<i>K. I. Hwu and Y. H. Chen</i>	
<i>Machines and Drives</i>	
A Natural Soft-Commutation PWM Scheme for Current Source Converter and Its Logic Implementation	2772
<i>Z. Bai, Z. Zhang, and X. Ruan</i>	
Shaping the Noise Spectrum in Power Electronic Converters	2780
<i>R. L. Kirlin, C. Lascu, and A. M. Trzynadlowski</i>	
Switching Ripple Characteristics of Space Vector PWM Schemes for Five-Phase Two-Level Voltage Source Inverters—Part 1: Flux Harmonic Distortion Factors	2789
<i>D. Dujic, M. Jones, E. Levi, J. Prieto, and F. Barrero</i>	
Switching Ripple Characteristics of Space Vector PWM Schemes for Five-Phase Two-Level Voltage Source Inverters—Part 2: Current Ripple	2799
<i>M. Jones, D. Dujic, E. Levi, J. Prieto, and F. Barrero</i>	
Suppression of Saturation Effects in a Sensorless Predictive Controlled Synchronous Reluctance Machine Based on Voltage Space Phasor Injections	2809
<i>R. Morales-Caporal and M. Pacas</i>	
Design Considerations for a Fault-Tolerant Flux-Switching Permanent-Magnet Machine	2818
<i>T. Ramíosoa, C. Gerada, and M. Galea</i>	
Switching Frequency Reduction Using Model Predictive Direct Current Control for High-Power Voltage Source Inverters	2826
<i>M. Preindl, E. Schatz, and P. Thøgersen</i>	
Steady-State and Dynamic State-Space Model for Fast and Efficient Solution and Stability Assessment of ASDs	2836
<i>J. Segundo-Ramírez, E. Bárcenas, A. Medina, and V. Cárdenas</i>	
A Simple Method to Reduce Torque Ripple in Direct Torque-Controlled Permanent-Magnet Synchronous Motor by Using Vectors With Variable Amplitude and Angle	2848
<i>Y. Zhang, J. Zhu, W. Xu, and Y. Guo</i>	
<i>Single-Phase Electronics</i>	
Optimizing Universal Ballasts Using Magnetic Regulators and Digital Control	2860
<i>J. M. Alonso, M. S. Perdigão, J. Ribas, D. Gacio, and E. S. Saraiva</i>	
SiC versus Si—Evaluation of Potentials for Performance Improvement of Inverter and DC–DC Converter Systems by SiC Power Semiconductors	2872
<i>J. Biela, M. Schweizer, S. Waffler, and J. W. Kolar</i>	
Design of Robust Digital PID Controller for H-Bridge Soft-Switching Boost Converter	2883
<i>V. Mummadi</i>	
Single-Switch High-Power-Factor Inverter Driving Piezoelectric Ceramic Transducer for Ultrasonic Cleaner	2898
<i>H.-L. Cheng, C.-A. Cheng, C.-C. Fang, and H.-C. Yen</i>	
Circuit-Model-Based Analysis of a Wireless Energy-Transfer System via Coupled Magnetic Resonances	2906
<i>S. Cheon, Y.-H. Kim, S.-Y. Kang, M. L. Lee, J.-M. Lee, and T. Zyung</i>	
An Improved LLC Resonant Inverter for Induction-Heating Applications With Asymmetrical Control	2915
<i>S. Chudjuarjeen, A. Sangswang, and C. Koompai</i>	
An Isolated DC/DC Converter Using High-Frequency Unregulated LLC Resonant Converter for Fuel Cell Applications	2926
<i>J.-Y. Lee, Y.-S. Jeong, and B.-M. Han</i>	
A Correlation-Based Islanding-Detection Method Using Current-Magnitude Disturbance for PV System	2935
<i>B.-G. Yu, M. Matsui, and G.-J. Yu</i>	
<i>Renewable Energy Systems</i>	
A Magnetoelectric Composite Energy Harvester and Power Management Circuit	2944
<i>P. Li, Y. Wen, C. Jia, and X. Li</i>	
Analysis and Implementation of a Dual Resonant Converter	2952
<i>B.-R. Lin, J.-J. Chen, and J.-Y. Jhong</i>	
Analysis and Implementation of a ZVS/ZCS DC–DC Switching Converter With Voltage Step-Up	2962
<i>B.-R. Lin, J.-Y. Dong, and J.-J. Chen</i>	
ZVS Resonant Converter With Parallel-Series Transformer Connection	2972
<i>B.-R. Lin and J.-Y. Dong</i>	

<i>Robotics and Mechatronics</i>		
Dynamic Load Emulation in Hardware-in-the-Loop Simulation of Robot Manipulators	A. Martin and M. R. Emami	2980
Design and Implementation of Fuzzy Control on a Two-Wheel Inverted Pendulum	C.-H. Huang, W.-J. Wang, and C.-H. Chiu	2988
<i>Control and Signal Processing</i>		
Iterative Learning Control for Sampled-Data Systems: From Theory to Practice	K. Abidi and J.-X. Xu	3002
Multivariable-PI-Based dq Current Control of Voltage Source Converters With Superior Axis Decoupling Capability	B. Bahrani, S. Kenzelmann, and A. Rufer	3016
Control of Voltage Source Inverter Using Multidimensional Feedback Quantization Modulator	J.-S. Hu, K.-Y. Chen, T.-Y. Shen, and C.-H. Tang	3027
Reset Control for Passive Bilateral Teleoperation	A. F. Villaverde, A. B. Blas, J. Carrasco, and A. B. Torrico	3037
Wavelet Fuzzy Neural Networks for Identification and Predictive Control of Dynamic Systems	C.-H. Lu	3046
Quasi Sliding Mode Control of Differential Linear Repetitive Processes With Unknown Input Disturbance	L. Wu, H. Gao, and C. Wang	3059
Optimal Control of a Nine-Level Class-D Audio Amplifier Using Sliding-Mode Quantization	S.-H. Yu and M.-H. Tseng	3069
<i>Diagnosis and Monitoring</i>		
Economic Analysis of Canary-Based Prognostics and Health Management	W. Wang and M. Pecht	3077
<i>Embedded Systems</i>		
A Review of Aeronautical Electronics and Its Parallelism With Automotive Electronics	J. Muñoz-Castañer, R. Asorey-Cacheda, F. J. Gil-Castiñeira, F. J. González-Castaño, and P. S. Rodríguez-Hernández	3090
Modular Multiplication and Exponentiation Architectures for Fast RSA Cryptosystem Based on Digit Serial Computation	G. D. Sutter, J.-P. Deschamps, and J. L. Imaña	3101
<i>Intelligent Systems</i>		
Evolving Gaits of a Hexapod Robot by Recurrent Neural Networks With Symbiotic Species-Based Particle Swarm Optimization	C.-F. Juang, Y.-C. Chang, and C.-M. Hsiao	3110
