

# **2015 6th Power Electronics, Drives Systems & Technologies Conference**

**(PEDSTC 2015)**

**Tehran, Iran  
3-4 February 2015**



**IEEE Catalog Number: CFP1511J-POD  
ISBN: 978-1-4799-7654-6**

## Table of Content

<b>001</b> - A Novel Multi-Input DC/DC Converter with a General Power Management Strategy for Grid Connected Hybrid PV/FC/Battery System <i>Saeideh Khadem Haghighian, Seyed Hossein Hosseini</i> -----	1
<b>002</b> - A Non-Isolated High Step-up DC-DC Converter With Soft Switching Using Coupled Inductor <i>M. Mohammadi, J.S. Moghani, J. Milimonfared, N. Safari</i> -----	7
<b>003</b> - Sliding-Mode Control of the DC-DC Flyback Converter in Discontinuous Conduction Mode <i>Mahdi Salimi, Vadood Hajbani</i> -----	13
<b>004</b> - A New Structure of Multilevel Inverters Based on Coupled Inductors to Increase the Output Current <i>Shirin Salehahari, Ebrahim Babaei, Mitra Sarhangzadeh</i> -----	19
<b>005</b> - Passive-rotor Disk-shaped Transverse-flux Permanent-magnet Generator for Small Wind Turbine Application <i>Mohammad Ali Noroozi, Javad S. Moghani, Reza Yazdanpanah</i> -----	25
<b>006</b> - A Double-Input DC-DC Converter for Hybrid Supply Systems <i>M. Mohammadi, J. Milimonfared, M. R. M. Behbahani, J. S Moghani, H. Moradi</i> -----	29
<b>007</b> - Sensor less Control of PMSG-Based Wind Turbine with Parallel Distributed Compensator with Fuzzy Observer <i>Mokhtar Shasadeghi, Mohammad Mardanah, Majid Nayeripour, Mahdi Mansuri</i> -----	35
<b>008</b> - New Single-Stage Soft-Switching Flyback Inverter for AC Module Application with Simple Circuit <i>Mojtaba Khalilian, Mehdi Malekane Rad, Ehsan Adib, Hosein Farzanehfard</i> -----	41
<b>009</b> - A Novel Modified Deadbeat Controller for Vehicle to Grid Application <i>Babak Farhangi</i> -----	47
<b>010</b> - Application of a new Hig Step-up Double-Input converter in a Novel Module-Integrated -Inverter Photovoltaic System <i>M. Mohammadi, N. Safari, J. Milimonfared, J. S. Moghani</i> -----	53

<b>011</b> - Interleaved Two-Switch Flyback Microinverter For Grid-tied Photovoltaic Applications <i>Saleh Mohammadi, H. Abootorabi Zarchi, Mahdi Amiri</i> -----	59
<b>012</b> - Distributed bus signaling control for a DC charging station with multi paralleled flywheel energy storage system <i>Bo Sun, Tomislav Dragicevic, Juan C. Vasquez, Josep M. Guerrero, Mehdi Savaghebi</i> -----	65
<b>013</b> - Cogging Torque Minimization in Double sided Axial Flux Magnetic Gear <i>Seyed Ahmadreza Afsari Kashani, Hossein Heydari, Babak Dianati</i> -----	71
<b>014</b> - DC-AC Buck and Buck-Boost Inverters for Renewable Energy Applications <i>Amin Ashraf Gandomi, Kazem Varesi, Seyed Hossein Hosseini</i> -----	77
<b>015</b> - Effects of ESR on Stability and Frequency Response of Cuk Converter by using Signal Flow Graph Method <i>Elshan Davaran Hagh, Parisa Mohammadalizadeh, Ebrahim Babaei</i> -----	83
<b>016</b> - Analyzing a Bridgeless Single Stage LLC Resonant PFC Converter Controlled by Frequency and Pulse Width Modulations Techniques <i>Mahdi Ghasemi, Reza Beiranvand, Mehran Jami</i> -----	89
<b>017</b> - High Efficiency, Low Size, and Low Weight Vehicle Battery Charger <i>Alireza Golahmar-Zavare, Mustafa Mohamadian, Reza Beiranvand</i> -----	96
<b>018</b> - New Approach for 6 Cylinder Diesel Electric Algorithm Control on One Cylinder Failure <i>Changiz Shifte, Hossein Abedini, Abdolmajid Akbarifard, S. Ebrahim Afjei</i> -----	103
<b>019</b> - Electrolytic Capacitor-Less AC–DC LED Driver with Constant Output Current and PFC <i>Hamed Valipour, Ghasem Rezazadeh, Mohammad Reza Zolghadri, Negar Noroozi</i> -----	107
<b>020</b> - One Cycle Control of Buck-Type, Current Source Inverter- Fed, Brushless DC Motor Drive <i>Omid Mohammadpour, Abolfazl Halvaei Niasar</i> -----	113
<b>021</b> - A Low-Cost P&O based Maximum Power Point Tracking, Combined with Two-Degree Sun Tracker <i>Abolfazl Halvaei Niasar, Zahra Zare, Fahimeh Rabiei Far</i> -----	119

<b>022</b> - An Active Capacitor Voltage Control for Symmetrical / Non-Symmetrical H-Bridge Flying Capacitor Multilevel Inverter <i>Jalal Amini, Abbas Hooshmand Viki, Ahmad Radan</i> -----	125
<b>023</b> - Extended Space Vector Control Method for Seven Level Inverter Driving a Winding Excited Synchronous Machine <i>Mahdi Mahdipour, Seyed Mohammad Taghi Bathaee</i> -----	131
<b>024</b> - Parameter Estimation of the Induction Motor Using Extended Kalman Filter for Wide Range Speed Control <i>Reza Dadkhah, Hadi Givi, Akram Mehdipour</i> -----	137
<b>025</b> - Design of a Three-Level Hysteresis Controller for a Four-Leg Voltage Source Inverter in Frame <i>Adel Nazemi, Omid Salari, Mohamad Tavakoli Bina</i> -----	143
<b>026</b> - Optimization the LLC Resonant Converter for Achieving Maximum Efficiency at a Predetermined Load Value <i>Mehran Jami, Reza Beiranvand, Mustafa Mohamadian, Mahdi Ghasemi</i> -----	149
<b>027</b> - An Optimized Variable-offset Modulation Technique for Three-phase Differential Multilevel Converters <i>Mohammad Jafar Mojibian, Mohammad Tavakoli Bina</i> -----	156
<b>028</b> - High Step-Up/Down DC-DC Bidirectional Converter with Low Switch Voltage Stress <i>Navid Molavi, Morteza Esteki, Ehsan Adib, Hosein Farzanehfard</i> -----	162
<b>029</b> - A 12/8 Double-Stator Switched Reluctance Motor for Washing Machine Application <i>M. Asgar, E. Afjei, A. Behbahani, A. Siadatan</i> -----	168
<b>030</b> - A Novel High Voltage Gain DC-DC Converter with Reduced Components Voltage Stress <i>Keyvan Yari, Mojtaba Forouzes, Alfred Baghrmian</i> -----	173
<b>031</b> - Novel T-Z Source Inverter With High Voltage Gain and Reduced Transformer Turn Ratio <i>Ali Mostaan, Saeed Sharifi Malfejani, Mohsen Soltani, Alfred Baghrmian</i> -----	178
<b>032</b> - Transformer Types Of Extended Z-Source Inverter With High Voltage Gain And Reduced Transformer Turns Ratio <i>Soroush Esmaeili, Abdolreza Sheikholeslami</i> -----	183

<b>033</b> - New High Step-Up DC-DC Converter for Photovoltaic Grid-Connected Applications <i>Sayed Abbas Arshadi, Ehsan Adib, Hosein Farzanehfard, Morteza Esteki</i> -----	189
<b>034</b> - High Step-up DC-DC Converter Based on Three-Winding Coupled Inductor <i>M. Khalilzadeh, M. Mahdipour, K. Abbaszadeh</i> -----	195
<b>035</b> - Multiobjective Fuzzy Predictive Torque Control of an Induction Motor Drive <i>Christian A. Rojas, Jose Rodriguez, Felipe Villarroel, Jose Espinoza, Davood A. Khaburi</i> -----	201
<b>036</b> - A Reduced Switch Multi-Input Converter for Low Power Variable Speed Wind Turbine Application <i>Mahdi Elmi, Rana Alizadeh, Ali Ajami</i> -----	207
<b>037</b> - Simplified Predictive Current Controlled Cascaded H-Bridge Multilevel Inverter for GridConnected Photovoltaic Systems <i>R Ghassemi, K Abbaszadeh</i> -----	213
<b>038</b> - A Modified Grid-Connected Current Source Inverter for Photovoltaic Application <i>Saeid Saeidabadi, Kazem Varesi, Seyed Hossein Hosseini, Mehran Sabahi</i> -----	218
<b>039</b> - Optimum Mode Operation of Piezoelectric Material for Energy Harvesting Applications <i>Ahmad Shabani, Alireza Hassanzadeh</i> -----	224
<b>040</b> - Modeling, Simulation and Implementation of a Sensorless Commutation Method for Brushless DC Motors without Phase Shifter <i>S. Mahdiuon-Rad, M. R. Azizian, S. Soleimanpour</i> -----	228
<b>041</b> - A Novel Method for Reference Signals Generation Applied to UPQC-PHEV for Grid Integration of WECS-SCIG <i>Majid Aryanezhad, Elahe Ostadaghaee, Mahmood Joorabian</i> -----	234
<b>042</b> - A New Switching Method for PWM Inverter with Uniform Distribution of Output Current's Spectrum <i>Hamed Kiani Savadkoohi, Davood Arab Khaburi, Sajad Sadr</i> -----	242
<b>043</b> - A New T-Type Direct AC/AC Converter <i>Masih Khodabandeh, Mohammad Reza Zolghadri, Negar Noroozi</i> -----	247
<b>044</b> - Simulation and Investigation of a Back-Triggered 6H-SiC High Power Photoconductive Switch <i>Z. Hemmat, R. Faez, S. Amiri</i> -----	253

<b>045</b> - Photovoltaic Single-Stage Grid Tied Inverter with One-Cycle Control <i>A Ketabi, S. E. Tabatabaei M.</i> -----	257
<b>046</b> - Designing A 48 V to 24 V DC-DC Converter for Vehicle Application Using a Resonant Switched Capacitor Converter Topology <i>Seyed Mohammad Mousavi, Reza Beiranvand, Shahin Goodarzi, Mustafa Mohamadian</i> -----	263
<b>047</b> - Fault Isolation and Diagnosis of Induction Motor Based on Multi-Sensor Data Fusion <i>Hamideh Jafari, Javad Poshtan</i> -----	269
<b>048</b> - Detection and Discrimination of Stator Interturn Fault and Unbalanced Supply Voltage Fault in Induction Motor Using Neural Network <i>Negin Lashkari, Javad Poshtan</i> -----	275
<b>049</b> - A novel switching pattern for switching loss reduction of an IPT-based single to three-phase cycloconverter <i>Sohrab Sahraneshin, Mohammad Hasan Ameri, Ali Yazdian Varjani, Reza Beiranvand</i> -----	281
<b>050</b> - A Technique for producing High Power Factor for HB-LEDs power Supply Based on Boost topology <i>L. Yarmohammadi, E. Afjei, A. Siadatan</i> -----	287
<b>051</b> - A New Algorithm for Increasing Balancing Speed of Switched-Capacitor Lithium-Ion Battery Cell Equalizers <i>Shahin Goodarzi, Reza Beiranvand, Seyed Mohammad Mousavi, Mustafa Mohamadian</i> -----	292
<b>052</b> - Analysis Flux Linkage Measurement Method without Using Rotor Clamping Device for Switched Reluctance Motors <i>Sayed Amir Hashemi, Amir Rashidi, Sayed Morteza Saghaeian Nejad</i> -----	298
<b>053</b> - Rotor Speed and Resistance Estimation Using Robust Extended Kalman Filter for Sensorless Vector Control of Induction Motor Drives <i>Pegah Rokhforoz, Javad Poshtan</i> -----	304
<b>054</b> - Optimal Four Quadrant Speed Control of Switched Reluctance Motor with Torque Ripple Reduction Based on EM-MOPSO <i>Mojtaba Mansouri Borujeni, Amir Rashidi, Sayed Morteza Saghaeian Nejad</i> -----	310

---

<b>055</b> - Investigation of the Effect of Winding Distribution and Slot Opening on Performance of an Axial Flux Hysteresis Motor <i>R. Nasiri-Zarandi, M. Mirsalim, R. Ashrafi</i> -----	316
<b>056</b> - Torque Ripple Reduction of Permanent Magnet Synchronous Motor with Non-sinusoidal Back Emf Using a Modified and Simplified Current Optimization Technique <i>Mohammad Ali Amirian, Amir Rashidi, Seyed Morteza Saghaeian Nejad</i> -----	322
<b>057</b> - Fault Current Limiting in a Wind Power Plant Equipped with a DFIG Using the Interface Converter and an Optimized Located FCL <i>M. Mardani, S. H. Fathi</i> -----	328
<b>058</b> - Controlling of a three phase Vienna Rectifier under Utility Side Distortion Based on Sliding Mode Controller <i>R. Reza Ahrabi, A. Ajami</i> -----	334
<b>059</b> - Wind Power Generation System Based Upon Permanent-Magnet Synchronous Generator and Ysource Converter <i>Vahid Behjat, Mohammad Javad Amroony boushehri, Seyed Semko Hosseini Nobahar</i> -----	340
<b>060</b> - Selective Harmonic Elimination Pulse Width Modulation in SinglePhase Modular MultiLevel Converter <i>Abbas Kiani Harchegani, Hossein Iman-Eini</i> -----	346
<b>061</b> - DTC-SVM Control Strategy for Induction Machine based on Indirect Matrix Converter in Flywheel Energy Storage System <i>F. Mardani Borujeni, M. Ardebili</i> -----	352
<b>062</b> - Using Auxiliary Signals as a Simple Method for Balancing DC Bus Voltages in Cascaded H- Bridge Converters <i>Masoud Shahabadini, Hossein Iman-Eini, Saeed Afsharnia</i> -----	358
<b>063</b> - Output Feedback Trajectory Tracking Control of a Car-like Drive Wheeled Mobile Robot Using RBF Neural Network <i>Yasamin Raeisi, Khoshnam Shojaei, Abbas Chatraei</i> -----	363

<b>064</b> - Improved Predictive Torque Control of a Permanent Magnet Synchronous Motor fed by a Matrix Converter <i>Mohsen Siami, D. A. Khaburi, Mosayeb Yousefi, Jose Rodriguez</i> -----	369
<b>065</b> - Dead Beat Control of Three Phase PWM Rectifier Using Virtual Flux Based Direct Power Control (DPC) and with no Line Voltage Measurements <i>Hamid Eskandari-Torbati, Davood A Khaburi, Vahid Eskandari-Torbati</i> -----	375
<b>066</b> - Open-Circuit Fault Detection and Localization in Modular Multilevel Converter <i>Houshang Salimian, Hossein Iman-Eini, Shahrokh Farhangi</i> -----	383
<b>067</b> - Predictive Voltage Control of Three-Phase Voltage Source Inverters to Supply Nonlinear and Unbalanced Loads <i>A. Pirooz, R. Noroozian</i> -----	389
<b>068</b> - Model Reference Control of PMSM Drive Systems Based on Model Predictive Control <i>Behzad Esmaeilnejad, Mina Fazli, Farzad Tahami</i> -----	395
<b>069</b> - A High Step-up Current-Fed Phase-Shift Double-Input DC-DC Convert Using Asymmetrical PWM Switching Strategy <i>M. Mohammadi, J. Milimonfared, J.S. Moghani, M. Taheri</i> -----	400
<b>070</b> - Permanent Synchronous Motor Predictive Deadbeat Current Control-Robustness Investigation <i>Alireza Abbaszadeh, Davood Arab Khaburi, Mohammad Ali Miremadi, Mojtaba Esmaeili</i> -----	406
<b>071</b> - EMI Consideration of High Reliability Electrical Power Subsystem (EPS) of Satellite <i>Tohid Rahimi, S. Hossein Hosseini</i> -----	412
<b>072</b> - Design of a sensorless controller for PMSM using Krill Herd algorithm <i>Aria Younesi, Sajjad Tohidi</i> -----	418
<b>073</b> - A Novel Method for Current Harmonic Reduction of CFLs in Large Number Usage <i>Melika Hassanzadeh, Abdoreza Sheikholeslami, Hoda Ghoreishi, Sina Mohseni, Mohammad Nazari</i> ---	424
<b>074</b> - Reliability Comparison of two Industrial AC/DC Converters with Resonant and non-Resonant Topologies <i>Hamed Valipour, Mahmud Fotuhi Firouzabad, Ghasem Rezazadeh, Mohammad Reza Zolghadri</i> -----	430

<b>075 - Z-H Buck Converter: Analysis and Simulation</b> <i>Taher Ahmadzadeh, Ebrahim Babaei</i> -----	436
<b>076 - Power Rating Reduction of Railway Power Quality Compensator Using Steinmetz Theory</b> <i>Hamed Jafarikaleybar, Rasool Kazemzadeh, Siamak Farshad</i> -----	442
<b>077 - Using Patterns of Stator and Rotor Laminations for Switched Reluctance Motor Control</b> <i>Mohammad Mehdi Nezamabadi, Ebrahim Afjei</i> -----	448
<b>078 - High Voltage Gain Y-Source Based Isolated DC-DC Converter With Continuous Input Current</b> <i>Mojtaba Forouzesh, Alfred Baghrmian</i> -----	453
<b>079 - Control of Grid-Connected Inverter to Inject Sinusoidal Current to Grid under non-ideal Conditions</b> <i>Mahdi Shahparasti, Mustafa Mohamadian, Mohammad Farzi</i> -----	458
<b>080 - A single-stage high power factor LED driver in continuous conduction mode</b> <i>A. Mohamadi, E. Afjei</i> -----	462
<b>081 - Power and Voltage Control in a Grid-Connected Microgrid System with a Back-to-Back Converter</b> <i>Hossein Sekhavatmanesh, Hossein Mokhtari, Mohsen Hamzeh, Ali Asbafkan</i> -----	468
<b>082 - Improved Constant Current Islanding Detection with Regardless NDZ and Its Stability Analysis</b> <i>A. Dehghani, H. Geramirad, S. H. Hosseinian</i> -----	474
<b>083 - An Isolated Three-Phase Three-Switch Buck Rectifier with Inrush Current Limiting</b> <i>N. Noroozi, M. R. Zolghadri</i> -----	480
<b>084 - Design of Switching Rule for Buck Converters Using Explicit Predictive Control</b> <i>Mohammad-Reza Zamani Behbahani, Reza Mahboobi Esfanjani, Mohammad Hejri</i> -----	486
<b>085 - Optimal Design of Multilevel Uninterruptible Power Supply</b> <i>Atefeh Zareie Ardestani, Mostafa Mohamadian, Ali Yazdian Varjani</i> -----	492
<b>086 - A Novel Self-starting Ultra Low-power and Lowvoltage Two-stage DC-DC Boost Converter for Microbial Energy Harvesting</b> <i>M. Ayaz, E. Farjah, T. Ghanbari</i> -----	498

<b>087</b> - Improving the LVRT Capability of the DFIG-Based Wind Turbines during Fault <i>Seyed Mohammad Madani, Ramtin Sadeghi, Behnaz Kharkan, Mehdi Abadi</i> -----	503
<b>088</b> - A Robust Back-Stepping Stabilization Scheme for Virtual Synchronous Generators in Weak Grids <i>Hamoun Pourroshanfekr, Esmaeil Rokrok, Mahshid Javidsharifi</i> -----	509
<b>089</b> - A new Structure of Y-Source Inverters with continuous input current and High Voltage Gain <i>Saman Asghari-Gorji, Ali Mostaan, Hamid Javadi</i> -----	515
<b>090</b> - New Three-Phase Zero-Voltage Switching PWM Inverter Using Resonant DC-Link <i>Mojtaba Khalilian, Adel Deris Zadeh, Ehsan Adib</i> -----	521
<b>091</b> - A Novel Dissipativity-Based Controller Design for DC/AC Converter in Uninterruptible Power Supply <i>A. Irani, M. Sojoodi, M. Mohamadian</i> -----	527
<b>092</b> - Improved design of coreless axial flux permanent magnet synchronous generator with low active material cost <i>A. Daghigh, H. Javadi, H. Torkaman</i> -----	532
<b>093</b> - Fast Detection of Open-Switch Fault in Cascaded H-Bridge Multilevel Converter <i>Mahmoud Shahbazi, MohammadReza Zolghadri</i> -----	538
<b>094</b> - Detection and Classification of Power-quality Events Using Discrete Gabor Transform and Support Vector Machine <i>Sobhan Naderian, Ahmad Salemnia</i> -----	544
<b>095</b> - Zeta converter operating in Discontinuous Capacitor Voltage Mode (DCVM) for LED driver <i>Javad shokrizadeh, Ehsan Adib, Hosein Farzanehfard</i> -----	550
<b>096</b> - A Modified Model Predictive Control Method for Voltage Control of an Inverter in Islanded Microgrids <i>Nima Naeiji, Mohsen Hamzeh, Ashkan Rahimi Kian</i> -----	555
<b>097</b> - New soft switching parallel PFC circuit <i>Nasrin Einabadi, Ehsan Adib, Hosein Farzanehfard</i> -----	561

<b>098</b> - Fault analysis on AC railway supply system <i>N. Noroozi, H. Mokhtari, M. R. Zolghadri, M. khodabandeh, A. Abazai, R. Seyyedi Khakshani, S. Mazaheri</i> -----	567
<b>099</b> - A Hybrid Switched-Capacitor Multilevel Inverter with Self Charge Balancing and Less Number of Switches <i>Elyas Zamiri, Reza Barzegarkhoo, Bagher Karami, S. H. Hosseini</i> -----	573
<b>100</b> - Development of an Integrated Switched-Reluctance Motor Drive with Battery Charging Capability for Electric Vehicle Propulsion System <i>Seyed Reza Khayam Huseini, Ebrahim Farjah, Nima Tashakor, Teymoor Ghanbari</i> -----	579
<b>101</b> - A New Control Approach for Reducing EMI in Cascaded H-Bridge Shunt Active Filter <i>Hamed Mehrabian-Nejad, Saleh Mohammadi, Babak Farhangi</i> -----	585
<b>102</b> - Increasing the Number of Voltage Levels in Single-Phase Multilevel Converters <i>Saleh Farzam Kia, Hossein Iman-Eini, Shahrokh Farhangi</i> -----	591
<b>103</b> - A Cost-Effective Sensorless Variable-Speed Wind Energy System <i>Mojtaba Heydari, Keyue Smedley</i> -----	597
<b>104</b> - Voltage Model Observer Based Encoderless Predictive Control of DFIG for Wind Turbine Applications <i>S. Alireza Davari, Davood Arab Khaburi</i> -----	603
<b>105</b> - Effect of Air-gap variation and the Number of Stator Slots on Performance of an Axial Flux Hysteresis Motor <i>R. Nasiri-Zarandi, M. Mirsalim, R. Ashrafi</i> -----	609
<b>106</b> - Transient and Steady States Analysis of Traction Motor Drive with Regenerative Braking and Using Modified Direct Torque Control (SVM-DTC) <i>Hasan Moghbeli, Mohammad Zarei, Seyed Sattar Mirhoseini</i> -----	615
<b>107</b> - Z-source online UPS <i>Alireza Niknam Kumle, S.H. Fathi, Majid Inanloo</i> -----	621

- 108** - A Switched-Capacitor Multilevel Inverter for High AC Power Systems with Reduced Ripple Loss Using SPWM Technique  
*Bagher Karami, Reza Barzegarkhoo, Adib Abrishamifar, Mehdi Samizadeh*----- 627
- 109** - Reduction of grid fault effect on operating of PM Wind Turbines equipped with Matrix converter  
*Alireza Nateghi, Hossein Kazemi Karegar, Reza Hazrati Sagharchi* ----- 633
- 110** - An Improved Method to Control the Speed and Flux of PM-BLDC Motors  
*D. Talebi Kordkandi, H. Khanbabaie gardeshi, H. Torkaman* ----- 639
- 111** - Conducted EMI Reduction of a Soft-Single-Switched Boost Converter Using Heat-sink Capacitance Cancellation  
*Mohammad Rouhollah Yazdani, Maryam Alirezaei, Hosein Farzanehfard*----- 645
- 112** - A Short Review on Multi-Input DC/DC Converters Topologies  
*Soheyl Khosrogorji, Hossein Torkaman, Farzin Karimi* ----- 650
- 113** - A Novel Simple Sensor less Algorithm in Order to Drive Switched Reluctance Motor from Standstill to High Speed  
*Ali Hayati, Alireza Siadatan, Peymaneh Shirazi* ----- 655
- 114** - Non-Isolated High Step-Up Converter Based on Combination of Flyback and Forward for Power Conditioning of Photovoltaic and Fuel-Cell Systems  
*H. Moradi Sizkahi, J. MiliMonfared, M. Taheri, S. Salehi Dobakhshari, M. Mohammadi* ----- 661