

JIDE JOURNAL OF POWER ELECTRONICS



Journal of Power Electronics

Aims and Scope

The *Journal of Power Electronics (JPE)* publishes papers of a high technical standard with a suitable balance of practice and theory. It covers a wide range of applications and apparatus in the power electronics field. The scope of the JPE includes the following:

- Low Power Converter
- High Power Converters
- Motor Drives
- Grid and Power Quality
- Energy Management Systems
- Devices and Components
- Consumer Power Electronics
- Emerging Power Electronics

The official abbreviation is *J. Power Electron.*

Copyright Information

For Authors

As soon as an article is accepted for publication, authors will be requested to assign copyright of the article (or to grant exclusive publication and dissemination rights) to the publisher (respective the owner if other than Springer Nature). This will ensure the widest possible protection and dissemination of information under copyright laws.

More information about copyright regulations for this journal is available at www.springer.com/43236

For Readers

While the advice and information in this journal is believed to be true and accurate at the date of its publication, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may have been made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduce and distribute the article (e.g., as offprints),

as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, on video disks, etc., without first obtaining written permission from the publisher (respective the copyright owner if other than Springer Nature). The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.

Springer Nature has partnered with Copyright Clearance Center's RightsLink service to offer a variety of options for reusing Springer Nature content. For permission to reuse our content please locate the material that you wish to use on link.springer.com or on springerimages.com and click on the permissions link or go to copyright.com and enter the title of the publication that you wish to use. For assistance in placing a permission request, Copyright Clearance Center can be contacted directly via phone: +1-855-239-3415, fax: +1-978-646-8600, or e-mail: info@copyright.com

© The Korean Institute of Power Electronics 2021

Journal Website

www.jpels.org
www.springer.com/43236

For the actual version of record please always check the online version of the publication.

Subscription Information

Journal of Power Electronics is published every month (12 times per year). Volume 21 (12 issues) will be published in 2021.

ISSN: 1598-2092 print
ISSN: 2093-4718 electronic

For information on subscription rates please contact Springer Nature Customer Service Center: customerservice@springernature.com

The Americas (North, South, Central America and the Caribbean)

Springer Nature Journal Fulfillment
Harborside Plaza II, 200 Hudson Street,
Jersey City, NJ 07302, USA
Tel.: 800-SPRINGER (777-4643);
212-460-1500 (outside North America)

Outside the Americas

Springer Nature Customer Service Center
GmbH, Tiergartenstraße 15,
69121 Heidelberg, Germany
Tel.: +49-6221-345-4303

Advertisements

E-mail contact: anzeigen@springer.com

Disclaimer

Springer Nature publishes advertisements in this journal in reliance upon the responsibility of the advertiser to comply with all legal requirements relating to the marketing and sale of products or services advertised. Springer Nature and the editors are not responsible for claims made in the advertisements published in the journal. The appearance of advertisements in Springer Nature publications does not constitute endorsement, implied or intended, of the product advertised or the claims made for it by the advertiser.

Office of Publication

Springer Nature Singapore Pte Ltd. /
Springer Singapore

Springer is part of
Springer Science+Business Media

Funding

This work was supported by the Korean Federation of Science and Technology Societies Grant funded by the Korean Government (Ministry of Education)

Co-Publisher

The Korean Institute of Power Electronics

Journal of Power Electronics

Aims and Scope

The *Journal of Power Electronics (JPE)* publishes papers of a high technical standard with a suitable balance of practice and theory. It covers a wide range of applications and apparatus in the power electronics field. The scope of the JPE includes the following:

- Low Power Converter
- High Power Converters
- Motor Drives
- Grid and Power Quality
- Energy Management Systems
- Devices and Components
- Consumer Power Electronics
- Emerging Power Electronics

The official abbreviation is *J. Power Electron.*

Copyright Information

For Authors

As soon as an article is accepted for publication, authors will be requested to assign copyright of the article (or to grant exclusive publication and dissemination rights) to the publisher (respective the owner if other than Springer Nature). This will ensure the widest possible protection and dissemination of information under copyright laws.

More information about copyright regulations for this journal is available at www.springer.com/43236

For Readers

While the advice and information in this journal is believed to be true and accurate at the date of its publication, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may have been made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduce and distribute the article (e.g., as offprints),

as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, on video disks, etc., without first obtaining written permission from the publisher (respective the copyright owner if other than Springer Nature). The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.

Springer Nature has partnered with Copyright Clearance Center's RightsLink service to offer a variety of options for reusing Springer Nature content. For permission to reuse our content please locate the material that you wish to use on link.springer.com or on springerimages.com and click on the permissions link or go to copyright.com and enter the title of the publication that you wish to use. For assistance in placing a permission request, Copyright Clearance Center can be contacted directly via phone: +1-855-239-3415, fax: +1-978-646-8600, or e-mail: info@copyright.com

© The Korean Institute of Power Electronics 2021

Journal Website

www.jpels.org
www.springer.com/43236

For the actual version of record please always check the online version of the publication.

Subscription Information

Journal of Power Electronics is published every month (12 times per year). Volume 21 (12 issues) will be published in 2021.

ISSN: 1598-2092 print
ISSN: 2093-4718 electronic

For information on subscription rates please contact Springer Nature Customer Service Center: customerservice@springernature.com

The Americas (North, South, Central America and the Caribbean)

Springer Nature Journal Fulfillment
Harborside Plaza II, 200 Hudson Street,
Jersey City, NJ 07302, USA
Tel.: 800-SPRINGER (777-4643);
212-460-1500 (outside North America)

Outside the Americas

Springer Nature Customer Service Center
GmbH, Tiergartenstraße 15,
69121 Heidelberg, Germany
Tel.: +49-6221-345-4303

Advertisements

E-mail contact: anzeigen@springer.com

Disclaimer

Springer Nature publishes advertisements in this journal in reliance upon the responsibility of the advertiser to comply with all legal requirements relating to the marketing and sale of products or services advertised. Springer Nature and the editors are not responsible for claims made in the advertisements published in the journal. The appearance of advertisements in Springer Nature publications does not constitute endorsement, implied or intended, of the product advertised or the claims made for it by the advertiser.

Office of Publication

Springer Nature Singapore Pte Ltd. /
Springer Singapore

Springer is part of
Springer Science+Business Media

Funding

This work was supported by the Korean Federation of Science and Technology Societies Grant funded by the Korean Government (Ministry of Education)

Co-Publisher

The Korean Institute of Power Electronics

Journal of Power Electronics

Volume 21 · Number 3 · March 2021

LOW POWER CONVERTERS

Quasi resonant converter for autonomous power supply

V. Strelkov · A. Dar'enkov · E. Sosnina · A. Shalukho · I. Lipuzhin **517**

HIGH POWER CONVERTERS

CAN bus based current sharing control of high-power switching converters

Q. Ye · M. Zeng · Y. Zhang · K. Wu **529**

Performance improvement of cascaded H-bridge multilevel inverters with modified modulation scheme

E.-J. Lee · K.-B. Lee **541**

Multi-loop current control strategy based on predictive control for multiphase pulse power supplies

Z. Yuan · P. Wen · H. Xu · Z. Yuan **553**

MOTOR DRIVES

Diagnosis and discernment between eccentricity and demagnetization faults in PMSM drives

M.B. Koura · A.H. Boudinar · A.F. Aimer · A. Bendabdellah · Z. Gherabi **563**

Model-free predictive current control for IPMSMs with multiple current difference updating technique

X. Wu · Z. Zhu · X. Liu · F. Yu **574**

GRID AND POWER QUALITY

Cost-effective synchronization strategy for distributed generators in islanded microgrids

M.-D. Pham · V.-T. Hoang · H.-H. Lee **583**

ENERGY MANAGEMENT SYSTEMS

Equivalent hysteresis model based SOC estimation with variable parameters considering temperature

Y. He · Q. Li · X. Zheng · X. Liu **590**

DEVICES AND COMPONENTS

Improved design of Lorentz force-type magnetic bearings for magnetically suspended gimballing flywheels

Q. Liu · Q. Wang · H. Li · C. Peng · K. Xu · Y. Ren **603**

A novel multi-physics field optimization method for GaN HEMT circuit design

R. Zhang · Y. Wang · H. Xu **616**

Further articles can be found at link.springer.com

Indexed in *Astrophysics Data System (ADS)*, *EBSCO Discovery Service*, *EI Compendex*, *Google Scholar*, *Institute of Scientific and Technical Information of China*, *Journal Citation Reports/Science Edition*, *Naver*, *OCLC WorldCat Discovery Service*, *ProQuest-ExLibris Primo*, *ProQuest-ExLibris Summon*, *SCImago*, *SCOPUS*, *Science Citation Index Expanded (SciSearch)*, *TD Net Discovery Service*, *UGC-CARE List (India)*

Instructions for Authors for *J. Power Electron.* are available at www.springer.com/43236

Table of Contents

Journal of Power Electronics Vol. 21, No. 3 March 2021

Low Power Converters

- Quasi resonant converter for autonomous power supply Vladimir Strelkov, Andrey Darenkov, Elena Sosnina, Andrey Shalukho, Ivan Lipuzhin 517

High Power Converters

- CAN bus based current sharing control of high-power switching converters Qiujin Ye, Min Zeng, Yingxian Zhang, Kaiyuan Wu 529
- Performance improvement of cascaded H-bridge multilevel inverters with modified modulation scheme Eui-Jae Lee, Kyo-Beum Lee 541
- Multi-loop current control strategy based on predictive control for multiphase pulse power supplies Zhibao Yuan, Pingping Wen, Haiping Xu, Zengquan Yuan 553

Motor Drives

- Diagnosis and discernment between eccentricity and demagnetization faults in PMSM drives Mohamed Boudiaf Koura, Ahmed Hamida Boudinar, Ameur Fethi Aimer, Azzedine Bendiabellah, Zakaria Gherabi 563
- Model-free predictive current control for IPMSMs with multiple current difference updating technique Xiaoxin Wu, Zhihao Zhu, Xing Liu, Feng Yu 574

Grid and Power Quality

- Cost-effective synchronization strategy for distributed generators in islanded microgrids Minh-Duc Pham, Van-Tuan Hoang, Hong-Hee Lee 583

Energy Management Systems

- Equivalent hysteresis model based SOC estimation with variable parameters considering temperature Yao He, Qiang Li, Xinxin Zheng, Xintian Liu 590

Device and Components

- Improved design of Lorentz force-type magnetic bearings for magnetically suspended gimballing flywheels Qiang Liu, Qirui Wang, Heng Li, Cong Peng, Kang Xu, Yuan Ren 603
- A novel multi-physics field optimization method for GaN HEMT circuit design Rui Zhang, Yibo Wang, Honghua Xu 616