

[< Back to results](#) | 1 of 1

[Export](#) [Download](#) [Print](#) [E-mail](#) [Save to PDF](#) [Add to List](#) [More...](#)
[Full Text](#)

Proceedings of the 8th International Conference on Computer and Communication Engineering, ICCCE 2021 • Pages 99 - 103 • 22 June 2021 • Article number 9467166 • 8th International Conference on Computer and Communication Engineering, ICCCE 2021 • Kuala Lumpur • 22 June 2021 through 23 June 2021 • Code 171135

Document type

Conference Paper

Source type

Conference Proceedings

ISBN

978-172811064-6

DOI

10.1109/ICCCE50029.2021.9467166

Publisher

Institute of Electrical and Electronics Engineers Inc.

Original language

English

View less [^](#)

Mathematical Design of Coil Parameter for Wireless Power Transfer using NI Multisims Software

 Yusoff S.H.^a [✉](#), Nanda N.N.^a [✉](#), Midi N.S.^a [✉](#), Abed Badawi A.S.^a [✉](#)
[Save all to author list](#)
^a International Islamic University Malaysia (IIUM), Electrical and Computer Engineering Department, Kuala, Malaysia

1

Citation in Scopus

[View all metrics >](#)

 Full text options [v](#)
[Abstract](#)
[Author keywords](#)
[Indexed keywords](#)
[SciVal Topics](#)
[Metrics](#)
[Funding details](#)
Abstract

This paper presents a new design of circular coil for both primary and secondary sides in wireless power transfer (WPT). This paper starts with the numerical solution of 500W power for ideal case WPT to calculate the values of coil parameters for both primary and secondary sides. The optimum value of coupling coefficient (k) was verified by $k < k_c$ where k_c is the critical coupling coefficient. After that, this paper designs the schematic circuit of this project by using all component values from the previous step. The circuit is then simulated by using NI Multisims software to obtain the measured values of the coil parameters. Next, this paper discusses the power efficiency between calculated and measured values. Finally, the summary of the suitable dimensions for inner and outer diameters and the number of turns needed for both primary and secondary coils are calculated by using the values of inductance. © 2021 IEEE.

Author keywords

electric vehicle (EV); mathematical design; NI Multisims; Wireless Power Transfer (WPT)

Cited by 1 document

In-depth perception of dynamic inductive wireless power transfer development: A review

 Nanda, N.N. , Hanifah, M.S.A. , Yusoff, S.H. (2021) *International Journal of Power Electronics and Drive Systems*
[View details of this citation](#)

Inform me when this document is cited in Scopus:

[Set citation alert >](#)
Related documents

Design of U and i Ferrite Core on Dynamic Wirelless Charging for Electric Vehicle

 Abdullah, A.A. , Yusoff, S.H. , Sulaiman, E. (2021) *Proceedings of the 8th International Conference on Computer and Communication Engineering, ICCCE 2021*

Investigation of magnetic properties for different coil sizes of dynamic wireless charging pads for electric vehicles (EV)

 Zaini, S.A. , Yusoff, S.H. , Abdullah, A.A. (2020) *IIUM Engineering Journal*

Design of circular pad coupler of inductive power transfer for electric vehicle (EV)






 Zaini, S.A. , Yusoff, S.H. , Hanifah, M.S.A. (2021) *Proceedings of the 8th International Conference on Computer and Communication Engineering, ICCCE 2021*

View all related documents based on references

Find more related documents in Scopus based on:

[Authors >](#) [Keywords >](#)

References (19)

[View in search results format >](#) All  [Export](#)  [Print](#)  [E-mail](#)  [Save to PDF](#)  [Create bibliography](#)

-
- 1 Zaini, S.A., Yusoff, S.H., Abdullah, A.A., Khan, S., Rahman, F.A., Nanda, N.N.
Investigation of magnetic properties for different coil sizes of dynamic wireless charging pads for electric vehicles (EV) ([Open Access](#))
- (2020) *IJUM Engineering Journal*, 21 (1), pp. 23-32. Cited 7 times.
<https://journals.iium.edu.my/ejournal/index.php/iiumej/article/download/1108/736/>
doi: 10.31436/iiumej.v21i1.1108
- [View at Publisher](#)
-
- 2 Aditya, K.
Design and Implementation of An Inductive Power Transfer System for Wireless Charging of Future Electric Transportation
(2016) *No. August*, p. 190.
-
- 3 Bosshard, R., Kolar, J.W.
Inductive Power
(2016) *No. September*, pp. 22-30.
-
- 4 Kim, S., Covic, G.A., Boys, J.T.
Triphasic pad for inductive power transfer systems for EV charging
- (2017) *IEEE Transactions on Power Electronics*, 32 (7), pp. 5045-5057. Cited 108 times.
<http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=4712525>
doi: 10.1109/TPEL.2016.2606893
- [View at Publisher](#)
-
- 5 Bojarski, M., Asa, E., Colak, K., Czarkowski, D.
Analysis and control of multiphase inductively coupled resonant converter for wireless electric vehicle charger applications
- (2017) *IEEE Transactions on Transportation Electrification*, 3 (2), art. no. 7469373, pp. 312-320. Cited 39 times.
https://www.ieee.org/membership-catalog/productdetail/showProductDetailPage.html?product=PER473-ELE&utm_source=Mainsite_CSE&utm_medium=CSE_Promotion&utm_campaign=Catalog_Promotion-PER473
doi: 10.1109/TTE.2016.2566921
- [View at Publisher](#)
-
- 6 Sampath, J.P.K., Vilathgamuwa, D.M., Alphones, A.
Efficiency Enhancement for Dynamic Wireless Power Transfer System with Segmented Transmitter Array
- (2016) *IEEE Transactions on Transportation Electrification*, 2 (1), art. no. 7355378, pp. 76-85. Cited 48 times.
https://www.ieee.org/membership-catalog/productdetail/showProductDetailPage.html?product=PER473-ELE&utm_source=Mainsite_CSE&utm_medium=CSE_Promotion&utm_campaign=Catalog_Promotion-PER473
doi: 10.1109/TTE.2015.2508721
- [View at Publisher](#)
-

- 7 Miller, J.M., Daga, A.
Elements of Wireless Power Transfer Essential to High Power Charging of Heavy Duty Vehicles
(2015) *IEEE Transactions on Transportation Electrification*, 1 (1), art. no. 7103359, pp. 26-39. Cited 78 times.
https://www.ieee.org/membership-catalog/productdetail/showProductDetailPage.html?product=PER473-ELE&utm_source=Mainsite_CSE&utm_medium=CSE_Promotion&utm_campaign=Catalog_Promotion-PER473
doi: 10.1109/TTE.2015.2426500
View at Publisher
-
- 8 Aditya, K., Sood, V.K., Williamson, S.S.
Magnetic characterization of unsymmetrical coil pairs using archimedean spirals for wider misalignment tolerance in ipt systems
(2017) *IEEE Transactions on Transportation Electrification*, 3 (2), art. no. 7862888, pp. 454-463. Cited 41 times.
https://www.ieee.org/membership-catalog/productdetail/showProductDetailPage.html?product=PER473-ELE&utm_source=Mainsite_CSE&utm_medium=CSE_Promotion&utm_campaign=Catalog_Promotion-PER473
doi: 10.1109/TTE.2017.2673847
View at Publisher
-
- 9 Covic, G.A., Boys, J.T.
Inductive power transfer (Open Access)
(2013) *Proceedings of the IEEE*, 101 (6), art. no. 6492113, pp. 1276-1289. Cited 739 times.
<http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=5>
doi: 10.1109/JPROC.2013.2244536
View at Publisher
-
- 10 Nanda, N.N., Yusoff, S.H., Toha, S.F., Hasbullah, N.F., Roszaidie, A.S.
A brief review: Basic coil designs for inductive power transfer (Open Access)
(2020) *Indonesian Journal of Electrical Engineering and Computer Science*, 20 (3), pp. 1703-1716. Cited 6 times.
<http://ijeecs.iaescore.com/index.php/IJECS/article/view/22837/14411>
doi: 10.11591/ijeecs.v20.i3.pp1703-1716
View at Publisher
-
- 11 Nayak, P.S.R., Kishan, D.
Performance analysis of series/parallel and dual side LCC compensation topologies of inductive power transfer for EV battery charging system
(2020) *Frontiers in Energy*, 14 (1), pp. 166-179. Cited 6 times.
<http://www.springerlink.com/content/2095-1701/>
doi: 10.1007/s11708-018-0549-z
View at Publisher
-
- 12 Yusoff, S., De Lillo, L., Zanchetta, P., Wheeler, P.
Predictive Control of a direct AC/AC matrix converter power supply under non-linear load conditions
(2012) *15th International Power Electronics and Motion Control Conference and Exposition, EPE-PEMC 2012 ECCE Europe*, art. no. 6397340, pp. DS3c.41-DS3c.46. Cited 13 times.
ISBN: 978-146731971-3
doi: 10.1109/EPEPEMC.2012.6397340
View at Publisher
-
- 13 Yusoff, S., De Lillo, L., Zanchetta, P., Wheeler, P., Cortes, P., Rodriguez, J.
PREDICTIVE CONTROL OF A DIRECT AC /AC MATRIX CONVERTER for POWER SUPPLY APPLICATIONS
-
- 14 Liu, C.
Overview of Coil Designs for Wireless Charging of Electric Vehicle
(2017), pp. 15-18.

- 15 Mohammad, M., Choi, S.
Optimization of ferrite core to reduce the core loss in double-D pad of wireless charging system for electric vehicles
(2018) *Conference Proceedings - IEEE Applied Power Electronics Conference and Exposition - APEC*, 2018-March, pp. 1350-1356. Cited 16 times.
ISBN: 978-153861180-7
doi: 10.1109/APEC.2018.8341192
[View at Publisher](#)
-
- 16 Ahmad, A., Alam, M.S., Chabaan, R.
A Comprehensive Review of Wireless Charging Technologies for Electric Vehicles
(2017) *IEEE Transactions on Transportation Electrification*, 4 (1), pp. 38-63. Cited 241 times.
https://www.ieee.org/membership-catalog/productdetail/showProductDetailPage.html?product=PER473-FL&utm_source=Mainsite_CSE&utm_medium=CSE_Promotion&utm_campaign=Catalog_Promotion-PER473
doi: 10.1109/TTE.2017.2771619
[View at Publisher](#)
-
- 17 Madawala, U.K., Thrimawithana, D.J.
A bidirectional inductive power interface for electric vehicles in V2G systems
(2011) *IEEE Transactions on Industrial Electronics*, 58 (10), art. no. 5711663, pp. 4789-4796. Cited 529 times.
doi: 10.1109/TIE.2011.2114312
[View at Publisher](#)
-
- 18 Strauch, L., Pavlin, M., Bregar, V.B.
Optimization, design, and modeling of ferrite core geometry for inductive wireless power transfer ([Open Access](#))
(2015) *International Journal of Applied Electromagnetics and Mechanics*, 49 (1), pp. 145-155. Cited 17 times.
<http://www.iospress.nl/>
doi: 10.3233/JAE-150029
[View at Publisher](#)
-
- 19 Djuric, S., Stojanovic, G., Damjanovic, M., Radovanovic, M., Laboure, E.
Design, modeling, and analysis of a compact planar transformer
(2012) *IEEE Transactions on Magnetics*, 48 (11), art. no. 6332565, pp. 4135-4138. Cited 29 times.
doi: 10.1109/TMAG.2012.2202642
[View at Publisher](#)

© Copyright 2021 Elsevier B.V., All rights reserved.

< Back to results | 1 of 1

^ Top of page

About Scopus

What is Scopus
Content coverage
Scopus blog
Scopus API
Privacy matters

Language

日本語に切り替える
切换到简体中文
切换到繁體中文
Русский язык

Customer Service

Help
Contact us