

## Document details

[< Back to results](#) | [< Previous](#) 2 of 2[Export](#) [Download](#) [Print](#) [E-mail](#) [Save to PDF](#) [Add to List](#) [More... >](#)ARPN Journal of Engineering and Applied Sciences  
Volume 10, Issue 21, 2015, Pages 9744-9747

Open Access

## Medium voltage range energy harvester application using boost converter

(Article)

Mustapha, N.A.C. [✉](#), Zahirul Alam, A.H.M., Khan, S., Azman, A.W. [👤](#)

Department of Electrical and Computer Engineering, IIUM, Kuala Lumpur, Malaysia

## Abstract

[View references \(15\)](#)

Energy obtained from the surrounding is usually very low and scarce. Such energy can be found from the vibration, solar and heat to name few. Often this energy is less than 1.5 V. Based on this motivation, DC-DC boost converter circuit is choose and design to convert low energy to sufficient amount to be used in normal circuit device and system application. This paper introduces a medium range output voltage using conventional DC-DC boost converter for low input supply range. Simulation has been done and compared with the experiment results. The purpose of this paper is to show the possibility of conversion very low energy to up to 50 V and to discuss a brief operation involved. A linear 4 V to 49 V output voltage trend was obtained from the experiment, under low switching frequency, 2 kHz. The targeted input used in this paper is between 0.1 V to 1.5 V suitable for energy harvesting purpose. © 2006-2015 Asian Research Publishing Network (ARPN).

## Author keywords

[Boost converter](#) [Energy harvesting](#) [Low frequency](#) [Low power consumption](#) [Low voltage](#)

## Funding details

Funding number	Funding sponsor	Acronym
	International Islamic University Malaysia	IIUM

ISSN: 18196608

Source Type: Journal

Original language: English

Document Type: Article

Publisher: Asian Research Publishing Network

## References (15)

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

- 1 Hawkes, A.M., Katko, A.R., Cummer, S.A.  
A microwave metamaterial with integrated power harvesting functionality

(2013) *Applied Physics Letters*, 103 (16), art. no. 163901. Cited 46 times.  
doi: 10.1063/1.4824473[View at Publisher](#)Metrics [🔗](#)

0 Citations in Scopus

0 Field-Weighted Citation Impact

PlumX Metrics [▼](#)

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

## Cited by 0 documents

Inform me when this document is cited in Scopus:

[Set citation alert >](#)[Set citation feed >](#)

## Related documents

Parametric analysis of single boost converter for energy harvester

Mustapha, N.A.C. , Alam, A.H.M.Z. , Khan, S. (2016) *2015 IEEE International Conference on Smart Instrumentation, Measurement and Applications, ICSIMA 2015*

Parametric sweep analysis of medium voltage range boost converter for energy harvester application

Mustapha, N.A.C. , Alam, A.H.M.Z. , Khan, S. (2016) *2015 IEEE International WIE Conference on Electrical and Computer Engineering, WIECON-ECE 2015*

Power loss analysis of two-stage PV-PCS using interleaved soft switching DC-DC converter

Kim, J.-H. , Won, C.-Y. , Lee, S.-W. (2009) *2009 IEEE 6th International Power Electronics*

- 2 Richelli, A., Colalongo, L., Tonoli, S., Kovács-Vajna, Z.M.  
A 0.2-1.2 V DC/DC boost converter for power harvesting applications

(2009) *IEEE Transactions on Power Electronics*, 24 (6), pp. 1541-1546. Cited 64 times.  
doi: 10.1109/TPEL.2009.2013224

[View at Publisher](#)

[View all related documents based on references](#)

[Find more related documents in Scopus based on:](#)

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

- 3 Bertacchini, A., Scorcioni, S., Cori, M., Larcher, L., Pavan, P.  
250mV input boost converter for low power applications

(2010) *IEEE International Symposium on Industrial Electronics*, art. no. 5637835, pp. 533-538. Cited 16 times.

ISBN: 978-142446391-6

doi: 10.1109/ISIE.2010.5637835

[View at Publisher](#)

- 4 Mousa, M., Ahmed, M., Orabi, M.  
A switched inductor multilevel boost converter

(2010) *PECon2010 - 2010 IEEE International Conference on Power and Energy*, art. no. 5697692, pp. 819-823. Cited 13 times.

ISBN: 978-142448946-6

doi: 10.1109/PECON.2010.5697692

[View at Publisher](#)

- 5 Lee, J.-H., Kim, J.-H., Won, C.-Y., Jang, S.-J., Jung, Y.-C.  
Soft switching multi-phase boost converter for photovoltaic system

(2008) *2008 13th International Power Electronics and Motion Control Conference, EPE-PEMC 2008*, art. no. 4635546, pp. 1924-1928. Cited 11 times.

ISBN: 978-142441742-1

doi: 10.1109/EPEPEMC.2008.4635546

[View at Publisher](#)

- 6 Mudliyar, K., Suryanarayana, K., Rao, H.  
Analysis of high frequency multi-phase multi-stage boost converter  
(2013) *International Journal Advance Electr. Electron. Engineering*, 2 (1), pp. 45-51. Cited 4 times.

- 7 Taufik, T., Gunawan, T., Dolan, D., Anwari, M.  
Design and analysis of Two-Phase Boost DC-DC converter

(2010) *World Academy of Science, Engineering and Technology*, 43, pp. 912-916. Cited 4 times.

<https://www.waset.org/journals/waset/v43/v43-165.pdf>

- 8 Huang, T.-C., Leu, Y.-G., Chang, Y.-C., Hou, S.-Y., Li, C.-C.  
An energy harvester using self-powered feed forward converter charging approach

(2013) *Energy*, 55, pp. 769-777. Cited 12 times.

[www.elsevier.com/inca/publications/store/4/8/3/](http://www.elsevier.com/inca/publications/store/4/8/3/)

doi: 10.1016/j.energy.2013.01.041

[View at Publisher](#)

- 9 Gendensuren, M., Park, J.-W., Lee, C.-S., Kim, N.-S.  
Low power integrated 0.35  $\mu$ m CMOS voltage-mode DC-DC boost converter

(2013) *International Conference on Power Engineering, Energy and Electrical Drives*, art. no. 6635659, pp. 502-505.

ISBN: 978-146736392-1

doi: 10.1109/PowerEng.2013.6635659

[View at Publisher](#)

□ 10 Cheng, S., Sathe, R., Natarajan, R.D., Arnold, D.P.

A voltage-multiplying self-powered AC/DC converter with 0.35 V minimum input voltage for energy harvesting applications

(2011) *Conference Proceedings - IEEE Applied Power Electronics Conference and Exposition - APEC*, art. no. 5744763, pp. 1311-1318. Cited 6 times.

ISBN: 978-142448084-5

doi: 10.1109/APEC.2011.5744763

[View at Publisher](#)

□ 11 Rao, Y., Arnold, D.P.

An input-powered vibrational energy harvesting interface circuit with zero standby power

(2011) *IEEE Transactions on Power Electronics*, 26 (12), art. no. 5958614, pp. 3524-3533. Cited 60 times.

doi: 10.1109/TPEL.2011.2162530

[View at Publisher](#)

□ 12 Cheng, S., Jin, Y., Rao, Y., Arnold, D.P.

An active voltage doubling AC/DC converter for low-voltage energy harvesting applications

(2011) *IEEE Transactions on Power Electronics*, 26 (8), art. no. 5654594, pp. 2258-2265. Cited 48 times.

doi: 10.1109/TPEL.2010.2096234

[View at Publisher](#)

□ 13 Ang, S.S., Oliva, A.

(2005) *Power-switching converters*, pp. 27-36.

2<sup>nd</sup> Ed. Taylor & Francis. Boca Raton, FL

□ 14 (2004) 'Boost switching converter design equations'

Daycounter, Inc. [Accessed: 19-Nov-2012]

<http://www.daycounter.com/LabBook/BoostConverter/Boost-Converter-Equations.phtml>

□ 15 Emadi, A., Khaligh, A., Nie, Z., Lee, J.

(2009) *Integrated power electronics converters and digital control*, pp. 8-12. Cited 32 times.

CRC Press/Taylor & Francis. Boca Raton, FL

🔍 Mustapha, N.A.C.; Department of Electrical and Computer Engineering, IIUM, Kuala Lumpur, Malaysia;

email:nurularfah@yahoo.com

© Copyright 2015 Elsevier B.V., All rights reserved.

[← Back to results](#) | [← Previous](#) 2 of 2

[^ 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](#)

