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Parametric analysis of single boost converter for energy harvester (Conference Paper)

Mustapha, N.A.C., Alam, A.H.M.Z., Khan, S., Azman, A.W.

Department of Electrical and Computer Engineering, International Islamic University Malaysia, Kuala Lumpur, Malaysia

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Abstract

This paper presents a conventional DC-DC **boost converter** for low and wide voltage supply range, suitable for **energy** harvesting purpose. The output voltage can be increased by controlling the transistor switching frequency, duty cycle, inductance, load capacitor, rise, and fall time. Both computer simulation and experiment results are performed in details. Experiment results have shown an error less than 6 % with the simulation. A linear trend of output voltage in the range of 4 V to 49 V is successfully converted from 100 mV to 1.5 V input voltage using low switching frequency of 2 kHz. The circuit parameter for this voltage range are L = 100 µH, D = 50 %, tr = tf = 2.9 µs considering C_L = 10 µF, and R_L = 10 kΩ. This circuit is suitable for medium voltage range application such as in automotive, aircraft, industry, and wireless measurement system. © 2015 IEEE.

Author keywords

boost converter; **energy** harvesting; low frequency; low input; low voltage; medium range

Indexed keywords

Engineering controlled terms: Electric inverters; **Energy** harvesting; Fighter aircraft; Reconfigurable hardware; Switching frequency

BOOST converter; low input; Low voltages; Low-frequency; Medium range

Engineering main heading: DC-DC converters

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