ISSN: 0975-766X
CODEN: IJPTFI
Available Online through *Research Article*
www.ijptonline.com

ANALYSIS OF BUCK CONVERTER USING POWER FACTOR PREREGULATOR MATLAB SIMULINK

K.Suvarchala*[1],R.Thangam[2]
U.G.Students, Department of Electrical Engineering, Saveetha School of Engineering, Chennai[1].
Assistant Professor, Department of Electrical Engineering, Saveetha School of Engineering, Thandalam, Chennai[2].
Email: suvarchalareddy99gmail.com

Received on 10-08-2016 *Accepted on 06-09-2016*

Abstract:

Buck-type converters are analyzed for application as which the IEC 1000-3- 2 gauges are met is figured power component preregulators. Two step-down converters are proposed, which agree to EMC principles on account of a helper fly back stage which employments the same switches of the primary converter in addition to a little power switch commutated at the line recurrence. With legitimate outline, the voltage anxiety of the primary switch continues as before with respect to a customary buck topology. Recreations and trial results are accounted for to approve the hypothetical investigation.

Keywords: Preregulator, Buck converter, Fly back, Mat lab Simulink.

I. Introduction

In ac-to- dc conversion, device having a rated modern less than 16A/phase must compare with IEC a 1000-3- 2 widespread which limits the harmonic content of the modern absorbed from the mains [1]. For this cause, many converter topologies have been analyzed within the literature for use as energy thing preregulators i.e. to provide nearly sinusoidal modern absorption and regulated dc output voltage [2-5]. Among them, the maximum popular is without a doubt the raise preregulator, which offers the following advantages: simplicity, inherent input modern-day filtering due to the input inductance, almost harmony energy element while running in CCM with average modern mode control [5]. still, it has a few drawbacks, particularly, no hindrance of the inrush present day at begin-up, loss of quick-circuit safety and output voltage greater than height enter voltage (VO= 380-400V for frequent enter voltage range).Those barriers can be triumph over by means of using a greenback-kind preregulator which but, shows a pulsed input modern-day and some line contemporary distortion, due to the notches round zero crossing of the road voltage. Despite the fact that, on the grounds that EC 1-3- 2 requirements permit a certain quantity of line modern-

day distortion [1,6],normally a strength variety exists in which the buck-kind preregulator meets the standards. Thispower variety is calculated, inside the first a part of the paper, for different voltage conversionratios and modulation strategies. Inside the 2d component, step-down topologies are proposed which encompass a chief buck converter and auxiliary fly back stage. This latter is used to take in cutting-edge even all through the time durations wherein the principle greenback converteris inactive. on this way, the enter modern-day distortion is reduced, thus growing the beneficial energy variety. Otherwise from the scheme proposed in [7], the fly back degree uses the identical switches of the main converter for the modulation and calls for handiest additional line-frequeney commutated stitches. Moreover, this auxiliary converter is rated for a fraction of the overall energy. Ultimately, simulation and experimental effects are stated which the

II. The Buck-Type Preregulator

The basic scheme of a buck converter used as a Preregulator is shown in Fig. 1. It consists of a diode bridge rectifier followed by a standard buck converter.

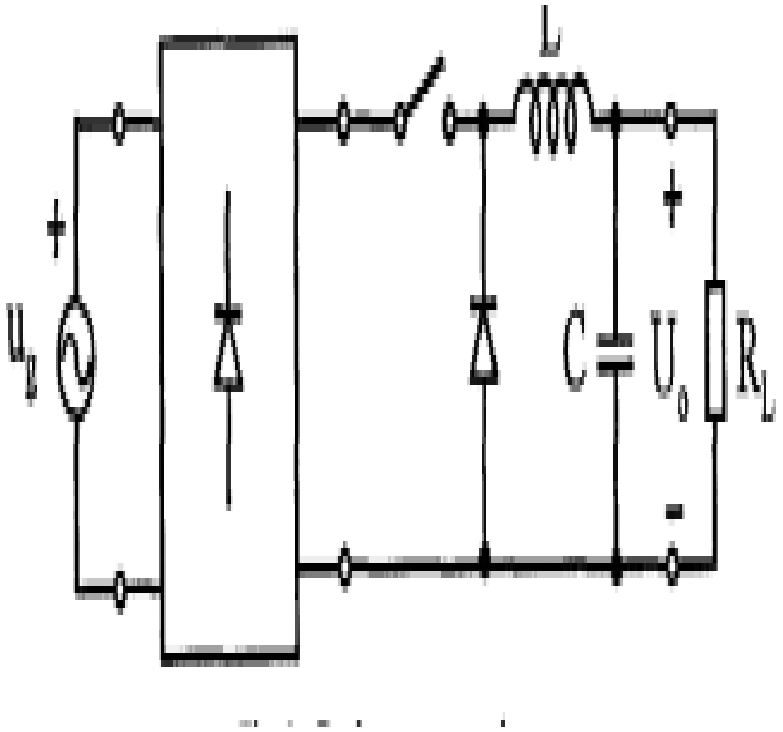

Fig. 1- Buck-type preregulator

As in buck-type preregulator, the output capacitor filters out the low-frequency components of the enter power. However, unlike the buck converter, the converter shown in Fig. 1 is able to draw contemporary from the line most effective while the input voltage is greater than the output voltage. As a zero outcome, notches seem inside the line contemporary around zero crossing of the line voltage, causing distortion.

Matlab simulation diagram for buck converter using pre-regulator:

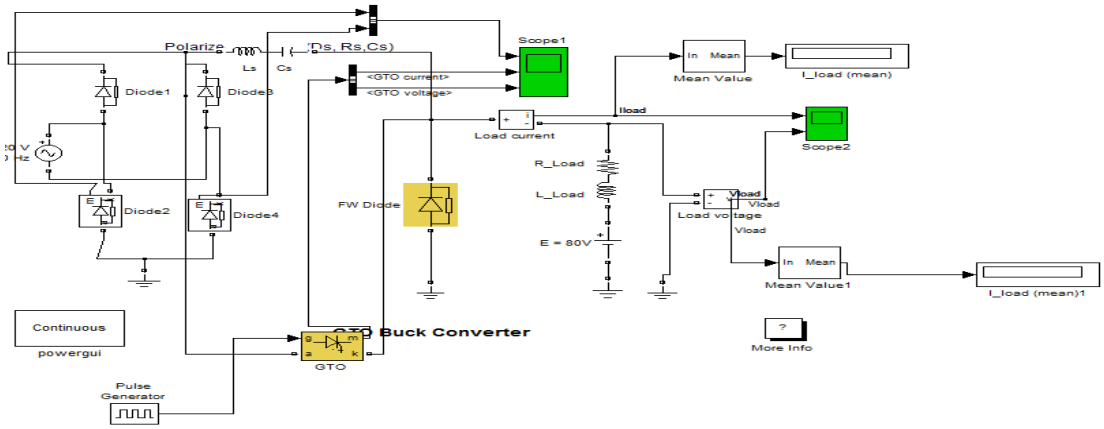

Fig .2: simulation circuit for buck converter using preregulator.

Matlab Result:

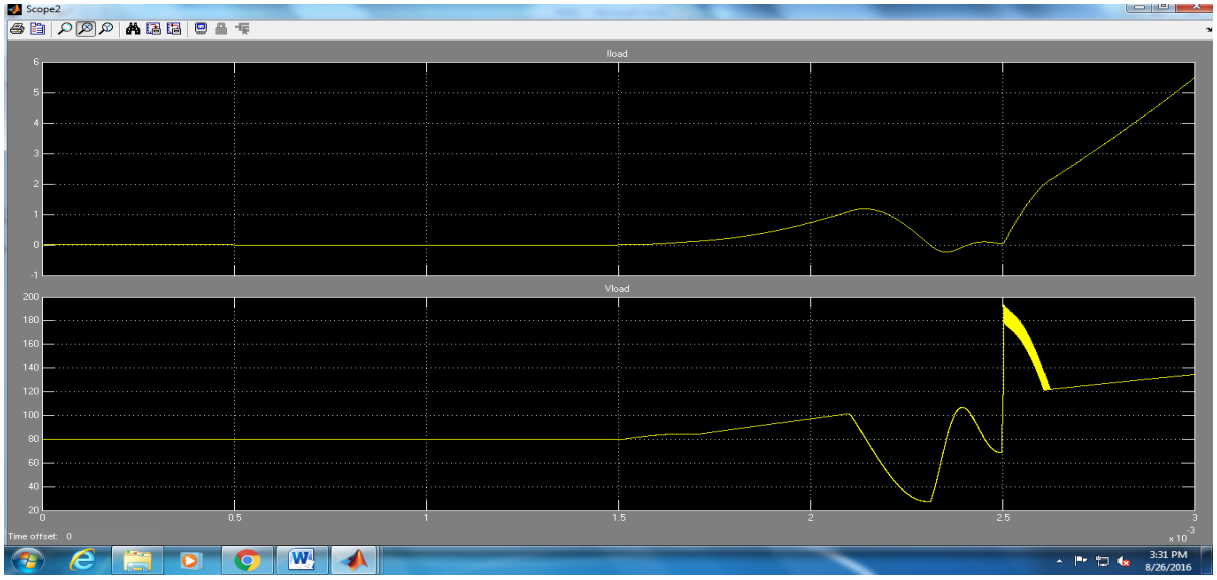

Fig.2. Output for rectifier.

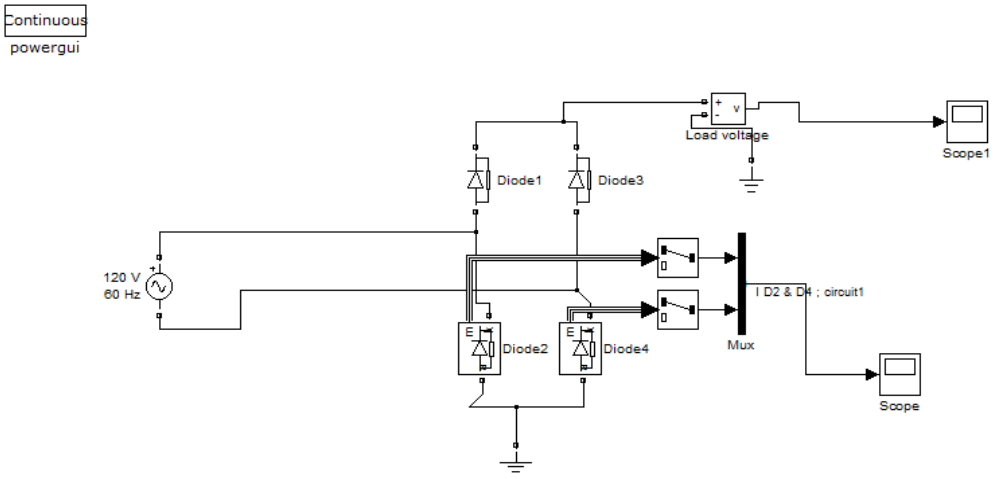

Fig .3: Circuit diagram for rectifier.

Simulation Result:

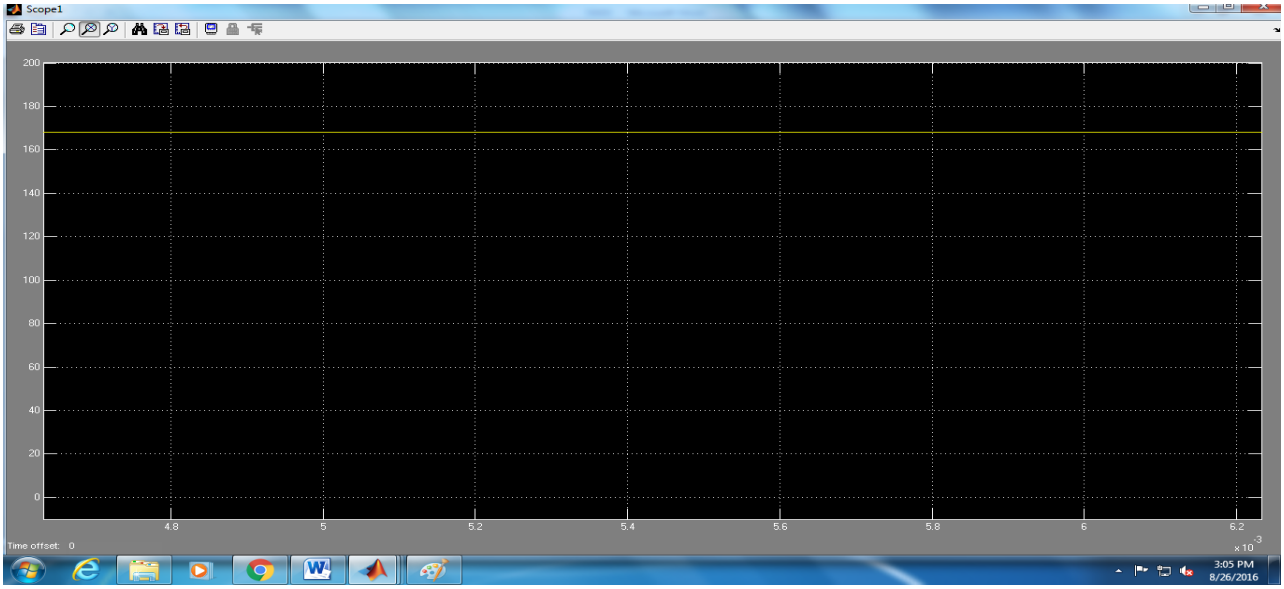

Fig.4. Output for rectifier.

Reference

1. Cavallaro, C.; Musumeci, S.; Santonocito, C.; Pappalardo, M. "Smart photovoltaic UPS system for domestic appliances"Clean Electrical Power, 2009 International Conference on Volume,Issue,91June2009Page(s):699-704.
2. B. Sahan, A.N. Vergara, N. Henze, A.Engler, P. Zacharias, "A Single-Stage PV Module Integrated Converter Based on a Low-Power Current-Source Inverter", IEEE Transactions on Industrial Electronics, Vol. 55, No. 7, July 2008.
3. R. Faranda and S. Leva, Energy Comparison of MPPT techniques for PV Systems, WSES Transaction on Power Systems, Vol. 3, pp. 446-455, 2008.