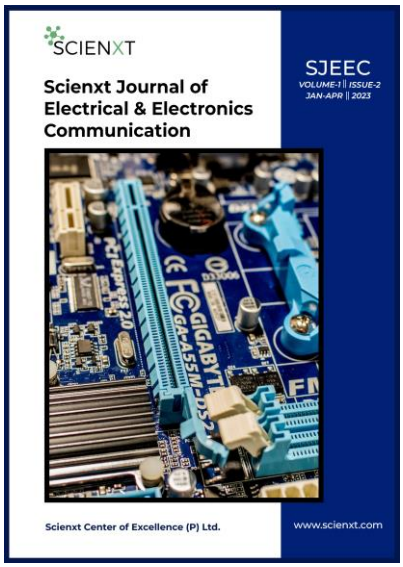

High Power Applications Using a Multi-Stage Soft Switching DC-DC Converter

Deepika. S[1*]
Electrical and Electronic Engineering Department
RV College of Engineering, Bangalore

Dr. Ravichandran. C
Centum Electronics Limited, Bengaluru

Dr. Dinesh. M. N
Electrical and Electronic Engineering Department
RV College of Engineering, Bangalore

Bhoopendra Kumar Singh
Centum Electronics Limited, Bengaluru

Dr. S. G. Srivani
Electrical and Electronic Engineering Department
RV College of Engineering, Bangalore

Vinod Chippalktti
Centum Electronics Limited Bengaluru, India

**Corresponding Author: Deepika. S*
Email: deepikas.epe21@rvce.edu.in

Abstract:

Due to the simplicity of its design and capability to provide total isolation between the input and output, the DC-DC converter topology is highly encouraged for producing power supply units. The development and execution of a multi-stage soft-switching DC-DC converter for high power applications. This technology enables the creation and deployment of a multi-stage soft-switching DC-DC converter, intended for high-power applications, that demonstrates improved efficiency and reduced weight. When contrasted with the conventional active clamped zero-voltage switching (ZVS) buck converter, several notable enhancements are observed. Specifically, the current passing through the freewheeling diode is reduced by fifty percent, while both the clamping voltage and duty cycle losses are similarly halved. The use of novel SiC MOSFETs, which have several intriguing characteristics like a bigger band gap and higher thermal conductivity and are anticipated to have reduced conduction losses and improved converter efficiency, is examined in this study. Using a half-bridge DC-DC converter and a ZVS Buck converter, this study describes two steps of voltage conversion for applications that require considerable power.

Keyword:

ZVS, Soft-switching, SiC MOSFET, Half bridge, Active clamping, Buck, PWM controller