National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: A Dual Output High-gain Flyback Converter for DC Microgrid Application
Speaker	: Ananya Pritilagna Biswal (520ee3018)
Supervisor	: Prof. Krishna Roy
Venue	: Seminar Room, EE-205
Date and Time	: 22 Jan 2025 (5:15 PM)
Abstract	: The demand for electrical energy utilization is immense and continues to rise. The market for non conventional, renewable energy sources is expanding rapidly to meet this growing demand. Among the various renewable energy resources, electrical energy generated from photovoltaic (PV) cells stands out as one of the most reliable and effective options for power generation. The increasing adoption of DC microgrids can be attributed to integrating renewable energy sources like solar photovoltaic systems and fuel cells. However, these DC power generators typically have low output voltages. To effectively connect them to the DC microgrid, there is a need for highly efficient, high-gain DC-DC converters that can boost the low input voltages to the required higher levels. The paper introduces a novel dual-output flyback converter topology that can be employed for various high-voltage applications. Conventionally, a flyback converter consists of one primary winding and one secondary winding. However, the proposed new topology incorporates an additional tertiary winding, which enables the generation of multiple outputs on the secondary side of the converter for bipolar DC microgrid applications. The proposed DC-DC converter is able to achieve higher gain at a lower duty ratio while providing galvanic isolation. The proposed high-gain converter topology is validated by MATLAB/Simulink platform simulations. The results obtained from this platform demonstrate the feasibility and sustainability of the proposed converter design.