EE561: Power Electronics Laboratory

Experiment 4: Study of Flyback Converter and SEPIC Converter using MATLAB/SIMULINK

Objective: The objective of this experiment is to study the operation of Flyback Converter and SEPIC Converter using MATLAB/SIMULINK.

Parameters:

Parameter	Flyback Converter	SEPIC Converter
Input voltage	24 V	48 V
Duty Ratio	1/3	2/3
Load Resistance	5 Ω	10 Ω
Switching frequency	20 kHz	50 kHz
Turns Ratio	1:5	Not Applicable
Capacitor	200 μF	200 μF (Both)
Ripple in Inductor current	20% of the average value (Magnetizing inductor)	20% of the average value (For Both Inductors)

Procedure

1. Calculate the Value of inductance for the given parameters
2. Simulate both the converters and note down the theoretical and simulated values of output voltage, Average inductor current and Ripple in inductor current
3. Take the snapshots of simulation results and prepare the report

Report

The report should contain the following information

Circuit diagram and theoretical waveforms

Design procedure and calculation of theoretical output voltage

Snapshot of the simulated circuit

Simulation results obtained: Input voltage, Output voltage, switching signal, inductor current

Snapshot of the simulation configuration parameters

Note: In Simulink, the circuit has to be simulated using a fixed time-step solver