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Development of a Transistor Analyzer for the Characterization of OFET.

ABSTRACT - Masterthesis

This master thesis report presents a voltage control Switch Mode Power Supply (SMPS). The thesis aspiration is to develop a transistor analyzer for the characterization of Organic Field Effect Transistors (OFET). The thesis work is primarily focused on the design of buck-boost converter by pulse-width-modulation (PWM). The buck-boost converter is mainly deployed for either to increase or decrease the output voltage as compare with input. The aim is to simulate and analyze such kind of SMPS topology and to design a controller to get an optimum output.

Conventionally, the DC-DC converters are operated by Continuous Conduction Mode (CCM) and Discontinuous Conduction Mode (DCM). These two modes are analyzed by DC and small signal performances. A set of mathematical models describes these DC and small signal to explain the converter circuit. The buck-boost converter provides fixed switching frequencies and it is highly efficient. But its performance deteriorates due to parasitic resistances. The output voltage of the converter is changed by varying the duty cycle of PWM. A control unit is integrated into this buck-boost converter to detect the error between desired voltage and output voltage based on a combination of feedback loop and setpoint.