A Self-Oscillating Control Scheme for a Boost Converter Providing a Controlled Output Current

Most switched mode power supplies provide a regulated voltage at their output. However, there are applications requiring a controlled current. Among others are battery chargers, test equipment for converters driven by solar cells, and LED drivers. This paper describes a dc–dc power converter realizing such a current source. The converter is based on a boost converter, supplied by a voltage source and acting as a current source. The boost converter can increase the output voltage above the input voltage. The converter provides a high control bandwidth based on a self-oscillating current loop. As additional practical features, soft start and output overvoltage limitation are included and described in this paper. The modulator, the control, and the power stage are described in detail and verified by the experiment.

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