

降压型 DC-DC 转换器的二次斜坡补偿电路设计

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摘 要: 考虑到传统线性斜坡补偿对开关电源系统带载能力和瞬态响应的影响, 利用与频率成正比的充放电电流形成一次斜坡电流, 再利用其一次特性与双极性晶体管的输入、输出特性实现了一种工作频率可变的, 斜坡峰值电流随占空比变化的二次特性的斜坡补偿, 使斜坡补偿所带来的不足有效减小. 最后利用 HHNEC 0.35 μm 的 BCD 工艺, 及 Hspice 仿真软件对电路进行了仿真验证.

关键词: 一次斜坡补偿; 二次斜坡补偿; 带负载能力; 瞬态响应

Design of a Quadratic Slope Compensation Circuit for

Buck DC-DC Converter

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Abstract: Considering the influence on load capacity and transient response caused by the traditional linear slope compensation. The proportional to the frequency of the charge and discharge current is used to form the first order slope current, then use it together with the input and output of the bipolar transistor characteristics realize quadratic slope compensation circuit which can work in different frequency and slope peak current changed with the duty cycle was proposed. The lack of the slope compensation effectively reduced. its performances have been verified by Hspice simulation using the 0.5 μm BCD process.

Key words: first-order slope compensation; quadratic slope compensation; load capacity; transient response

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