SEMTECH

SC454
Single-Phase Single Chip
IMVP-6/6+ Vcore Power Supply

POWER MANAGEMENT

Description

The SC454 is a single-phase chip, high-performance PWM controller designed to power advanced IMVP-6 and IMVP6+™ processors. On-chip support is provided for all of the IMVP-6/6+ requirements, including Active Voltage Positioning, Geyserville-3 VID transitions, VID-Controlled Deeper Sleep voltage setting, PSI#, DPRSTP#, DPRSLP Control, Fast and Slow C4 Exit, and default Boot Voltage.

The SC454 implements hysteretic control technology which provides the fastest possible transient response while avoiding the stability issues inherent to classical PWM controllers. Eliminating the sense resistors reduces costs and PCB area, plus increases system efficiency. Integrated SmartDriver™ technology initially turns on the high-side driver with 'soft' drive to reduce ringing, EMI, and capacitive turn-on of the low side MOSFET, while also increasing overall efficiency.

Hysteretic operation adaptively reduces the SC454 switching frequency at light loads. Combined with an automatic "power-save" mode which prevents negative current flow in the low-side FET, system efficiency is significantly enhanced during light loading conditions.

A 7-bit DAC, accurate to 0.85%, sets the output voltage reference, and implements the 0.300V to 1.500V range required by the processor. The DAC slew rate is externally programmed to minimize transient currents and audible noise. True differential remote sensing provides accurate point-of-load regulation at the processor die. Other features include programmable soft-start, open-drain IMVP-6/6+ PWRGD and CLKEN# outputs, dynamic current sharing, over-voltage and programmable over-current protection. The SC454 is available in a space-saving 32-pin MLP package.

Features

- Single-Phase Solution with Integrated Drivers
- Hysteretic Control for Fast Transient Response
- VR_TT Support
- Active Voltage Positioning
- True Differential Remote (die) Sensing
- On-Chip Support for all IMVP-6/6+ Power Management Features
- VID Programmed Deeper Sleep Voltage
- Fast/Slow C4E Break Event Support
- Clock Enable (CLKEN#) Output
- Delayed Power Good Signal with Blanking
- Programmable Soft-Start and DAC Slew Control
- Programmable OCP Threshold
- Supports all Ceramic Decoupling Solutions
- 32-pin MLP (5x5)
- Latched Over-Voltage Protection

Applications

- IMVP-6/6+ Notebook PCs
- Embedded Applications