POWER MANAGEMENT

Description

The SC452 is a single chip high-performance PWM controller designed to power advanced IMVP-6™ processors. On-chip support is provided for all of the IMVP-6 requirements, including Active Voltage Positioning, Geyserville-3 VID transitions, VID-controlled Deeper Sleep voltage setting, PSI# and DPRSL control, fast/slow C4 exit, and default Boot voltage.

The SC452 implements hysteretic control technology which provides the fastest possible transient response while avoiding the stability issues inherent to classical PWM controllers. Semtech's proprietary Combi-Sense® technology provides a loss-less current sensing scheme which is extremely robust and easy to lay out. 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 SC452 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. The SC452 changes from dual-phase to single-phase operation whenever PSI# asserts, providing optimal efficiency across the entire power range.

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 IMVP6_PWRGD and CLKEN# outputs, dynamic current sharing, over-voltage and programmable over-current protection. The SC452 is available in a space-saving 44 pin MLP package.

Features

◆ Dual-Phase Solution with Integrated Drivers
◆ Hysteretic Control for Fast Transient Response
◆ Combi-Sense Provides Loss-Less Current Sensing
◆ Dynamic Current Sharing
◆ Active Voltage Positioning
◆ True Differential Remote (die) Sensing
◆ On-Chip Support for all IMVP-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
◆ 44 pin MLP (7x7)
◆ Lead-free Package

Applications

◆ IMVP-6/6+ Notebook PCs
◆ Embedded Applications
◆ Graphics and Other Processor Cores