

POWER MANAGEMENT**Description**

The SC458 is a single chip high-performance PWM controller designed to power advanced processors. On-chip support is provided for Active Voltage Positioning, “VID on-the-fly” transitions, single and dual phase control.

The SC458 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 SC458 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 SC458 changes from dual-phase to single-phase operation whenever DUAL transitions low, providing optimal efficiency across the entire power range. A second low power control pin, DRIFT, allows the output voltage to be discharged by the load during a negative voltage transition.

A 7-bit DAC, accurate to 0.85%, sets the output voltage reference, and implements a 0.300V to 1.500V range. 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, dual (delayed, and not delayed) power good outputs, dynamic current sharing, over voltage and programmable over current protection. The SC458 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 Loss-Less Current Sensing
- ◆ Dynamic Current Sharing
- ◆ Active Voltage Positioning
- ◆ True Differential Remote Sensing
- ◆ Dual Power Good Outputs
- ◆ Programmable Soft-Start and DAC Slew Control
- ◆ Programmable OCP Threshold
- ◆ Supports all Ceramic Decoupling Solutions
- ◆ 44 pin MLP (7x7 mm)
- ◆ Product is WEEE and RoHS Compliant

Applications

- ◆ Graphics and other Processor Cores
- ◆ Notebook PCs
- ◆ Embedded Applications