MAXIM

Quick-PWM Master Controllers for Voltage-Positioned CPU Core Power Supplies (IMVP-IV)

General Description

The MAX1907A/MAX1981A are single-phase, Quick-PWM™ master controllers for IMVP-IV™ CPU core supplies. Multi-phase operation is achieved using a Quick-PWM slave controller (MAX1980). Multiphase operation reduces input ripple current requirements and output voltage ripple while easing component selection and layout difficulties. The MAX1907A/MAX1981A include active voltage positioning with adjustable gain and offset, reducing power dissipation and bulk output capacitance requirements.

The MAX1907A/MAX1981A are intended for two different notebook CPU core applications: either bucking down the battery directly, or 5V system supply to create the core voltage. The single-stage conversion method allows these devices to directly step down high-voltage batteries for the highest possible efficiency. Alternatively, two-stage conversion (stepping down the 5V system supply instead of the battery) at higher switching frequency provides the minimum possible physical size.

The MAX1907A/MAX1981A meet the IMVP-IV specifications and include logic to interface with the CPU power good signals from the V_{CCP} and V_{CCMCH} rails within the system. The regulator features power-up sequencing, automatically ramping up to the Intel-specified boot voltage. The MAX1907A/MAX1981A feature independent four-level logic inputs for setting the boot voltage (B0–B2) and the suspend voltage (S0–S2).

The MAX1907A/MAX1981A include output undervoltage protection, thermal protection, and system power-OK (SYSPOK) input/output. When any of these protection features detect a fault, the MAX1907A/MAX1981A immediately shut down. Additionally, the MAX1907A includes overvoltage protection.

The MAX1907A/MAX1981A are available in a thin 40-pin QFN package.

Applications

IMVP-IV™ Notebook Computers

Single-Phase CPU Core Supply

Multiphase CPU Core Supply

Voltage-Positioned Step-Down Converters

Servers/Desktop Computers

Typical Operating Circuit appears at end of data sheet.

Quick-PWM is a trademark of Maxim Integrated Products, Inc.
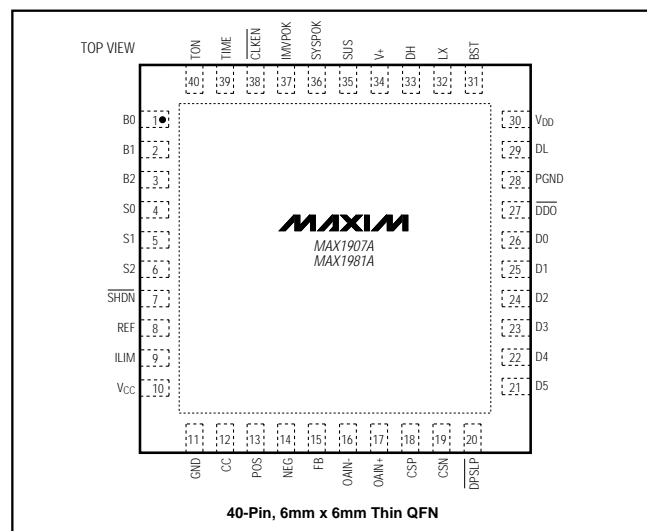
IMVP-IV is a trademark of Intel Corp.

Features

♦ **Quick-PWM Master Controllers**

♦ **Multiphase Conversion with Slave Controller (MAX1980)**

♦ **Active Voltage Positioning with Adjustable Gain and Offset**

♦ **Adjustable Slew Rate Control**

♦ **±0.75% V_{OUT} Accuracy Over Line, Load, and Temperature**

♦ **6-Bit On-Board DAC (16mV Increments)**

♦ **0.700V to 1.708V Output Adjust Range**

♦ **Selectable 200kHz/300kHz/550kHz/1000kHz Switching Frequency**

♦ **2V to 28V Battery Input Voltage Range**

♦ **Drive Large Synchronous Rectifier MOSFETs**

♦ **Output Overvoltage Protection (MAX1907A Only)**

♦ **Undervoltage and Thermal Fault Protection**

♦ **Power Sequencing and Selectable Boot Voltage**

♦ **Low-Profile 40-Pin Thin QFN, 6mm × 6mm Package**

Ordering Information

PART	TEMP RANGE	PIN-PACKAGE
MAX1907AETL	-40°C to +100°C	40-QFN Thin 6mm x 6mm
MAX1981AETL	-40°C to +100°C	40-QFN Thin 6mm x 6mm

Pin Configuration

40-Pin, 6mm x 6mm Thin QFN

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