se visit www.intersil.com/products/isl6247

A Mobile Multi-Phase PWM Controller with Precision Current Sensing

The ISL6247 provides microprocessor core-voltage regulation by driving up to four interleaved synchronous-rectified buck-converter channels in parallel. Multi-phase buck converter architecture uses interleaved timing to multiply ripple frequency and reduce input and output ripple currents. The reduction in ripple results in fewer components, lower component cost, reduced power dissipation, and smaller implementation area. The ISL6247 multi-phase controller together with ISL6207 gate drivers forms the basis for a portable power supply solution to power Intel's next generation mobile microprocessors.

Intel Mobile Voltage Positioning (IMVP) is a smart voltage regulation technology which effectively reduces power dissipation in Intel® Pentium® Processors. The ISL6247 supports the IMVP-5 mobile processor voltage regulation specifications. To boost battery life, the ISL6247 operates in Active, Deep Sleep, or Deeper Sleep modes, depending upon the logic levels at the DSEN# and DRSEN pins. A 6-bit digital-to-analog converter (DAC) allows dynamic adjustment of the core output voltage from 0.8375V to 1.6V. The controller features a thermal monitor which sends a signal to the microprocessor to reduce the load before power system components exceed their maximum thermal limits, reducing the thermal design complexity and overall core-voltage regulation cost.

To improve efficiency, the ISL6247 allows users to select one of two popular lossless current sense techniques. The ISL6247 supports detection via inductor coil resistance (DCR), or the $r_{DS(ON)}$ of the lower MOSFET. Either cost and space-saving method provides feedback for precision droop, channel current balancing, and individual channel over-current protection. A unity gain, differential amplifier is provided for remote voltage sensing. The differential amplifier eliminates errors due to potential differences between remote and local grounds. Eliminating ground differences improves regulation and protection accuracy. The channel switching frequency is adjustable in the range of 200kHz to 1.0MHz, providing flexibility in managing the balance between high-speed response, target efficiency, and good thermal management.

Ordering Information

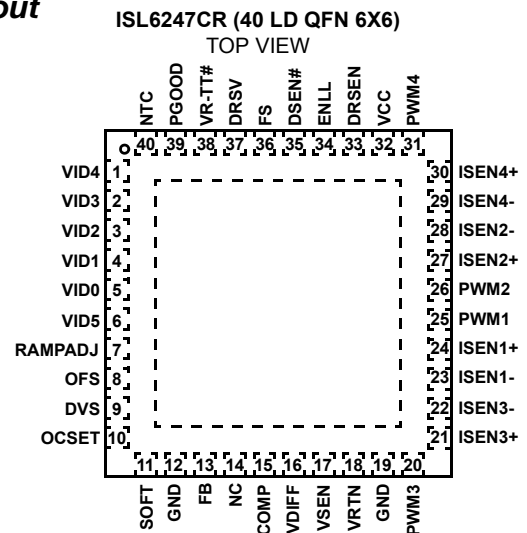| PART NUMBER	TEMP. (°C)	PACKAGE	PKG. DWG. #
ISL6247CR	-10 to 100	40 Ld 6x6 QFN	L40.6X6
ISL6247CR-T	40 Lead 6x6 QFN Tape and Reel		
Lead-Free Packaging (Pb Free)			
ISL6247CRZ	-10 to 100	40 Ld 6x6 QFN	L40.6X6
ISL6247CRZ-T	40 Lead 6x6 QFN Tape and Reel		

Features

- Precision Multi-Phase Core Voltage Regulation
  - ±0.6% System Accuracy Over Temperature
- Microprocessor Voltage Identification Input
  - 6-Bit VID Input
  - 0.8375V to 1.600V in 12.5mV Steps
  - Supports VID Changes During Operation
- Multiple Current Sensing Approaches Supported
  - Lossless DCR Current Sensing
  - Precision Resistive Current Sensing
  - Low Cost $R_{DS(on)}$ Current Sensing
- Excellent Dynamic Response
  - Combined Input Voltage Feed-Forward and Pulse-by-Pulse Average Current Mode
- DSEN# and DRSEN Logic Inputs for Low Power States
- DSV Voltage Input for DEEP SLEEP Mode
- DRSV Voltage Input for DEEPER SLEEP Mode
- Thermal Monitor
- Active Channel Current Balancing
- Differential Remote Voltage Sensing
- Individual Channel Over-Current, Over-Voltage, and Under-Voltage Protection
- 2, 3, or 4-Phase Operation
- User selectable Switching Frequency of 200K - 1.0MHz
  - 400kHz - 4MHz Effective Ripple Frequency
- QFN Package Option
  - QFN Compliant to JEDEC PUB95 MO-220 QFN - Quad Flat No Leads - Product Outline
  - QFN Near Chip Scale Package Footprint; Improves PCB Efficiency, Thinner in Profile

Applications

- Notebook Computer IMVP-5 DC/DC converter

Pinout

ISL6247CR (40 LD QFN 6X6)
TOP VIEW

intersil

intersil™