ISL62882C

Multiphase PWM Regulator for IMVP-6.5™ Mobile CPUs and GPUs

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The ISL62882C is a multiphase PWM buck regulator for microprocessor or graphics processor core power supply. The multiphase buck converter uses interleaved phases to reduce the total output voltage ripple with each phase carrying a portion of the total load current, providing better system performance, superior thermal management, lower component cost, reduced power dissipation, and smaller implementation area. The ISL62882C uses two integrated gate drivers to provide a complete solution. The PWM modulator is based on Intersil's Robust Ripple Regulator (R^3) technology™. Compared with traditional modulators, the $R^{3™}$ modulator commands variable switching frequency during load transients, achieving faster transient response. With the same modulator, the switching frequency is reduced at light load, increasing the regulator efficiency.

The ISL62882C can be configured as CPU or graphics Vcore controller and is fully compliant with IMVP-6.5™ specifications. It responds to PSI# and DPRSLPVR signals by adding or dropping Phase 2, adjusting overcurrent protection threshold accordingly, and entering/exiting diode emulation mode. It reports the regulator output current through the IMON pin. It senses the current by using either discrete resistor or inductor DCR whose variation over temperature can be thermally compensated by a single NTC thermistor. It uses differential remote voltage sensing to accurately regulate the processor die voltage. The unique split LGATE function further increases light load efficiency. The adaptive body diode conduction time reduction function minimizes the body diode conduction loss in diode emulation mode. User-selectable overshoot reduction function offers an option to aggressively reduce the output capacitors as well as the option to disable it for users concerned about increased system thermal stress. The ISL62882C offers the FB2 function to optimize 1-phase performance.

Applications

- Notebook Core Voltage Regulator
- Notebook GPU Voltage Regulator

Features

- Programmable 1- or 2-Phase CPU or GPU Mode Operation
- Precision Multiphase Core Voltage Regulation
  - 0.5% System Accuracy Over-Temperature
  - Enhanced Load Line Accuracy
- Microprocessor Voltage Identification Input
  - 7-Bit VID Input, 0V to 1.500V in 12.5mV Steps
  - Supports VID Changes On-The-Fly
- Supports Multiple Current Sensing Methods
  - Lossless Inductor DCR Current Sensing
  - Precision Resistor Current Sensing
- Supports PSI# and DPRSLPVR modes
- Superior Noise Immunity and Transient Response
- Current Monitor and Thermal Monitor
- Differential Remote Voltage Sensing
- High Efficiency Across Entire Load Range
- Two Integrated Gate Drivers
- Excellent Dynamic Current Balance Between Phases
- Split LGATE1 Drivers Increases Light Load Efficiency
- FB2 Function Optimizes 1-Phase Mode Performance
- Adaptive Body Diode Conduction Time Reduction
- User-selectable Overshoot Reduction Function
- Small Footprint 40 Ld 5x5 TQFN Packages
- Pb-Free (RoHS Compliant)

Related Literature

- See AN1461 for ISL62882/ISL62882C Evaluation Board Application Note “ISL62882EVAL2Z User Guide”
- See TB495, "ISL62882C, ISL62883C Connection Guidelines for 1-Phase Configuration"
- See TB496, "VR_ON Timing Guidelines for ISL6288x Products"

Load Line Regulation