

## ISL9500

### Precision Multi-Phase Buck PWM Controller

FN9248

Rev 0.00

December 2, 2005

The ISL9500 multi-phase Buck PWM control IC, with integrated half bridge gate drivers, provides a precision voltage regulation system for microprocessors in notebook computers. Two-phase operation eases the thermal management issues and load demand of high performance processors. This control IC also features both input voltage feed-forward and average current mode control for excellent dynamic response, "Loss-less" current sensing using MOSFET  $r_{DS(ON)}$  and user selectable switching frequencies from 250kHz to 1MHz per phase.

The ISL9500 includes a 6-bit digital-to-analog converter (DAC) that dynamically adjusts the CORE PWM output voltage. The ISL9500 also has logic inputs to select Active, Deep Sleep and Deeper Sleep modes of operation. A precision reference, remote sensing and proprietary architecture, with integrated, processor-mode, compensated "Droop", provide excellent static and dynamic CORE voltage regulation.

To improve efficiency at light loading, the ISL9500 can be configured to run in single phase PWM in Active, Deep or Deeper Sleep modes of operation. Also, in Deep and Deeper sleep modes the ISL9500 will operate in diode emulation.

Another feature of this IC controller is the PGOOD monitor circuit that is held low until CORE voltage increases, during its soft-start sequence, to within 12% of the "Boot" voltage. This PGOOD signal is masked during VID changes. Output overcurrent, overvoltage and undervoltage are monitored and result in the converter latching off and PGOOD signal being held low.

The overvoltage and undervoltage thresholds are 112% and 84% of the VID, Deep or Deeper Sleep setpoint, respectively. Overcurrent protection features a 32 cycle overcurrent shutdown. PGOOD, overvoltage, undervoltage and overcurrent provide monitoring and protection for the microprocessor and power system. The ISL9500 IC is available in a 38 lead TSSOP.

### Features

- Diode Emulation Functionality in Deep and Deeper Sleep Modes for Improved Light Load Efficiency
- Single and/or Two-phase Power Conversion
- "Loss-less" Current sensing for Improved Efficiency and Reduced Board Area
  - Optional Discrete Precision Current Sense Resistor
- Internal Gate-Drive and Boot-Strap Diodes
- Precision CORE Voltage Regulation
  - 0.8% System Accuracy Over Temperature
- 6-Bit Microprocessor Voltage Identification Input
- Programmable "Droop" and CORE Voltage Slew Rate
- Direct Interface with System Logic for Deep and Deeper Sleep modes of operation
- Easily Programmable Voltage Setpoints for Initial "Boot", Deep Sleep and Deeper Sleep Modes
- Excellent Dynamic Response
  - Combined Voltage Feed-Forward and Average Current Mode Control
- Overvoltage, Undervoltage and Overcurrent Protection
- Power-Good Output with Internal Blanking during VID and Mode Changes
- User programmable Switching Frequency of 250kHz - 1MHz
- Pb-Free Plus Anneal Available (RoHS Compliant)

### Ordering Information

PART NUMBER	PART MARKING	TEMP RANGE (°C)	PACKAGE	PKG. DWG. #
ISL9500CVZ (See Note)	ISL9500CVZ	-10 to 85	38 Ld TSSOP (Pb-free)	M38.173
ISL9500CVZ-T (See Note)	ISL9500CVZ	-10 to 85	38 Ld TSSOP Tape and Reel (Pb-free)	M38.173

**NOTE:**

Intersil Pb-free plus anneal products employ special Pb-free material sets; molding compounds/die attach materials and 100% matte tin plate termination finish, which are RoHS compliant and compatible with both SnPb and Pb-free soldering operations. Intersil Pb-free products are MSL classified at Pb-free peak reflow temperatures that meet or exceed the Pb-free requirements of IPC/JEDEC J STD-020.

**© Copyright Intersil Americas LLC 2005. All Rights Reserved.**  
**All trademarks and registered trademarks are the property of their respective owners.**

For additional products, see [www.intersil.com/en/products.html](http://www.intersil.com/en/products.html)

---

Intersil products are manufactured, assembled and tested utilizing ISO9001 quality systems as noted in the quality certifications found at [www.intersil.com/en/support/qualandreliability.html](http://www.intersil.com/en/support/qualandreliability.html)

---

*Intersil products are sold by description only. Intersil may modify the circuit design and/or specifications of products at any time without notice, provided that such modification does not, in Intersil's sole judgment, affect the form, fit or function of the product. Accordingly, the reader is cautioned to verify that datasheets are current before placing orders. Information furnished by Intersil is believed to be accurate and reliable. However, no responsibility is assumed by Intersil or its subsidiaries for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Intersil or its subsidiaries.*

---

For information regarding Intersil Corporation and its products, see [www.intersil.com](http://www.intersil.com)

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».



**JONHON**

«**JONHON**» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«**FORSTAR**» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А