

Single-Phase Core Regulator for Mobile CPUs

The ISL9505 is a single-phase buck regulator with embedded gate drivers.

The heart of the ISL9505 is the patented R³ Technology™, Intersil's Robust Ripple Regulator modulator. Compared with the traditional multi-phase buck regulator, the R³ Technology™ has faster transient response. This is due to the R³ modulator commanding variable switching frequency during a load transient.

To boost battery life, the ISL9505 supports DPRSLP (deeper sleep) function and maximizes the efficiency via automatically changing operation modes. At heavy load in the active mode, the regulator commands the continuous conduction mode (CCM) operation. When the CPU enters deeper sleep mode, the ISL9505 enables diode emulation to maximize the efficiency at light load. Asserting the FDE pin of the ISL9505 in deeper sleep mode will further decrease the switching frequency at light load and increase the regulator efficiency.

A 7-bit digital-to-analog converter (DAC) allows dynamic adjustment of the core output voltage from 0.300V to 1.500V. The ISL9505 has 0.5% system voltage accuracy over temperature.

A unity-gain differential amplifier provides remote voltage sensing at the CPU die. This allows the voltage on the CPU die to be accurately measured and regulated. Current sensing can be implemented through either lossless inductor DCR sensing or precise resistor sensing. If DCR sensing is used, an NTC thermistor network will thermally compensate the gain and the time constant variations caused by the inductor DCR change.

Features

- Precision single-phase CORE voltage regulator
 - 0.5% system accuracy over temperature
 - Enhanced load line accuracy
- Internal gate driver with 2A driving capability
- Microprocessor voltage identification input
 - 7-Bit VSEL input
 - 0.300V to 1.500V in 12.5mV steps
 - Support VSEL change on-the-fly
- Multiple current sensing schemes supported
 - Lossless inductor DCR current sensing
 - Precision resistive current sensing
- Thermal monitor
- User programmable switching frequency
- Differential remote voltage sensing at CPU die
- Overvoltage, undervoltage, and overcurrent protection
- Pb-free plus anneal available (RoHS compliant)

Ordering Information

PART NUMBER (NOTE)	PART MARKING	TEMP RANGE (°C)	PACKAGE (Pb-free)	PKG. DWG. #
ISL9505HRZ	ISL9505 HRZ	-10 to +100	40 Ld 6x6 QFN	L40.6x6
ISL9505HRZ-T	ISL9505 HRZ	-10 to +100	40 Ld 6x6 QFN Tape and Reel	L40.6x6

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.

All Intersil U.S. products are manufactured, assembled and tested utilizing ISO9001 quality systems.
Intersil Corporation's quality certifications can be viewed at www.intersil.com/design/quality

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