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ISL6215

Precision Multi-Phase Buck PWM Controller for Intel Mobile Voltage Positioning
IMVP-III

FN9051
Rev 0.00
November 2001

The ISL6215 Multi-Phase Buck PWM control IC with ISL6205 half bridge gate drivers provide a precision voltage regulation system for advanced microprocessors in notebook computers. Three-phase operation and discrete external gate drivers address the thermal management issues and load demand of Intel's latest high performance processors. This control IC also features both input voltage feed-forward and average current mode control for excellent dynamic response, lossless current sensing using MOSFET's $R_{DS(ON)}$ and user selectable switching frequencies from 200kHz to 1MHz.

The ISL6215 includes a 5 bit digital-to-analog converter (DAC) that dynamically adjusts the CORE PWM output voltage from 0.600V to 1.70V and conforms to the Intel IMVP III mobile VID specification. The ISL6215 also has logic inputs to detect between Performance / Battery mode and Deep Sleep / Deeper Sleep suspend modes. Single channel PWM, to improve efficiency at light load operation, is available during Deeper Sleep operation. A precision reference, remote sensing and proprietary architecture with integrated processor mode-compensated droop provide excellent static and dynamic CORE voltage regulation.

Another feature of this controller IC is the PGOOD monitor circuit which is held low until CORE voltage increases, during its Soft-Start sequence, to within 10mV of the programmed voltage. The Overvoltage threshold is 1.725V and CORE output voltage above this level results in converter shutting down. Undervoltage, 86% of programmed level, results in PGOOD being pulled low. Overcurrent protection features pulse by pulse current limiting. PGOOD, Overvoltage, Undervoltage and Overcurrent features provide monitoring and protection for the microprocessor and power system.

The ISL6215 IC package is available in 28 lead SSOP.

Ordering Information

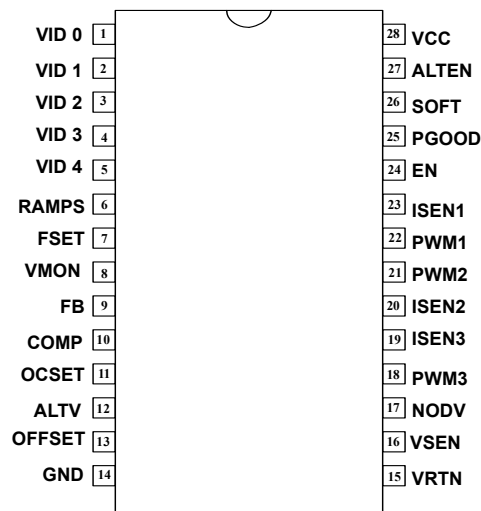| PART NUMBER	TEMP. (^{O}C)	PACKAGE	PKG. NO.
ISL6215CA	-10 to 85	28 Lead SSOP	M28.15
ISL6215CA-T	-10 to 85	28 Lead SSOP Tape and Reel	M28.15

Features

- Multi-Phase Power Conversion
- High Efficiency Current Sensing
  - Option for thermal compensation
  - Optional Current-Sense Resistor for Precision Overcurrent
- Precision CORE Voltage Regulation
  - 1% System Accuracy Over Temperature
- Microprocessor Voltage Identification Input
  - 5-Bit VID Input
  - 1.000V to 1.700V in 50mV steps
  - 0.600V to 1.000V in 25mV steps
  - Programmable Droop Voltage
- ALTEN and ALTV voltage bypass VID code
- OFFSET input for DEEP SLEEP Mode
- Programmable slew rate control on output voltage
- Excellent Dynamic Response
  - Combined Voltage Feed-Forward and Average Current Mode Control
- Over Voltage, Undervoltage and Overcurrent Protection
- 2 or 3 Phase "User Selectable" Operation
- Power-Good Output
- User selectable Switching Frequency of 200kHz -1MHz
  - 400kHz - 3.0MHz Effective Ripple Frequency

Pinout

ISL6215 (28 Lead SSOP)

TOP VIEW

Pin	Name		Pin	Name
1	VID 0		28	VCC
2	VID 1		27	ALTEN
3	VID 2		26	SOFT
4	VID 3		25	PGOOD
5	VID 4		24	EN
6	RAMPS		23	ISEN1
7	FSET		22	PWM1
8	VMON		21	PWM2
9	FB		20	ISEN2
10	COMP		19	ISEN3
11	OCSET		18	PWM3
12	ALTV		17	NODV
13	OFFSET		16	VSEN
14	GND		15	VRTN

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