Device Information

ISL6364

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Dual 4-Phase + 1-Phase PWM Controller for VR12/IMVP7 Applications

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Datasheet

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V_{IN} (min) (V)	4.75
V_{IN} (max) (V)	5.25
V_{OUT} (min) (V)	.25
V_{OUT} (max) (V)	1.52
I_{OUT} (max) (A)	130
V_{BIAS} (V)	5
Applications	VR12/IMVP7
Max # of outputs	2
Max # of phases	4
Droop	Y
Integrated MOSFET Driver	N

Product Information

Key Features

Intel VR12/IMVP7 Compliant
- SerialVID with Programmable IMAX, TMAX, BOOT, ADDRESS OFFSET Registers

Intersils Proprietary Enhanced Active Pulse Positioning (EAPP) Modulation Scheme, Patented
- Voltage Feed-forward and Ramp Adjustable Options
- High Frequency and PSI Compensation Options
- Variable Frequency Control During Load Transients to Reduce Beat Frequency Oscillation
- Linear Control with Evenly Distributed PWM Pulses for Better Phase Current Balance During Load Transients

Dual Outputs
- Output 1 (VR0): 1 to 4-Phase, Coupled Inductor Compatibility, for Core or Memory
- Output 2 (VR1): Single Phase for Graphics, System Agent, or Processor I/O
- Differential Remote Voltage Sensing
- ±0.5% Closed-loop System Accuracy Over Load, Line and Temperature
- Phase Doubler Compatibility (NOT Phase Dropping)

Proprietary Active Phase Adding and Dropping with Diode Emulation Scheme For Enhanced Light Load Efficiency

Programmable Slew Rate of Fast Dynamic VID for VR0

Dynamic VID Compensation (DVS) for VR1 at No Droop

Droop and Diode Emulation Options

Programmable 1 or 2-Phase Operation in PSI1/2/3 Mode

Programmable Standard or Coupled-Inductor Operation

Precision Resistor or DCR Differential Current Sensing
- Integrated Programmable Current Sense Resistors
- Integrated Thermal Compensation
- Accurate Load-Line (Droop) Programming
- Accurate Channel-Current Balancing
- Accurate Current Monitoring

Average Overcurrent Protection and Channel Current Limit With Internal Current Comparators

Precision Overcurrent Protection on IMON & IMONS Pins

Independent Oscillators, up to 1MHz Per Phase, for Cost, Efficiency, and Performance Optimization

Dual Thermal Monitoring and Thermal Compensation

Start-up Into Pre-Charged Load

Pb-Free (RoHS Compliant)

Description

The ISL6364 is a dual PWM controller; its 4-phase PWMs control the microprocessor core or the memory voltage regulator, while its single-phase PWM controls the peripheral voltage regulator for graphics, system agent, or processor I/O.

The ISL6364 utilizes Intersils proprietary Enhanced Active Pulse Positioning (EAPP) modulation scheme to achieve the extremely fast transient response with fewer output capacitors.

The ISL6364 is designed to be compliant to Intel VR12/IMVP7 specifications. It accurately monitors the load current via the IMON pin and reports this information via the IOUT register to the microprocessor, which sends a PSI# signal to the controller at low power mode via SVID bus. The controller enters 1- or 2-phase operation in low power mode (PSI1); in the ultra low power mode (PSI2,3), it can further drop the number of phases and then enable the diode emulation of the operational phase. In low power modes, the magnetic core and switching losses are significantly reduced, yielding high efficiency at light load. After the PSI# signal is de-asserted, the dropped phase(s) are added back to sustain heavy load transient response and efficiency.

Todays microprocessors require a tightly regulated output voltage position versus load current (droop). The ISL6364 senses the output current continuously by measuring the voltage across the dedicated current sense resistor or the DCR of the output inductor. The sensed current flows out of the FB pin to develop the precision voltage drop across the feedback resistor for droop control. Current sensing circuits also provide the needed signals for channel-current balancing, average overcurrent protection and individual phase current limiting. The TM and TMS pins are to sense an NTC thermistors temperature, which is internally digitized for thermal monitoring and for integrated thermal compensation of the current sense elements of the respective regulator.

The ISL6364 features remote voltage sensing and completely eliminates any potential difference between remote and local grounds. This improves regulation and protection accuracy. The threshold-sensitive enable input is available to accurately coordinate the start-up of the ISL6364 with other voltage rails.

Pricing / Packaging / Samples / Ordering

	iBuy direct from Intersil		iBuy direct - out of stock		Request samples
	Check distributor inventory	**Pb**	Available in RoHS/Pb-Free		

Part No.	Design-In Status	Temp.	Package	MSL	Price US $	**Pb**			
ISL6364CRZ	Active	Comm	48 Ld QFN	3		✔	🔴	🟡	🔵
ISL6364CRZ-T	Active	Comm	48 Ld QFN T+R	3		✔	🔴	🟡	
ISL6364IRZ	Active	Ind	48 Ld QFN	3		✔	🔴	🟡	🔵
ISL6364IRZ-T	Active	Ind	48 Ld QFN T+R	3		✔		🟡	

The price listed is the manufacturer's suggested retail price for quantities of 1K units. However, prices in today's market are fluid and may change without notice.

MSL = Moisture Sensitivity Level - per IPC/JEDEC J-STD-020

SMD = Standard Microcircuit Drawing

Technical Documentation

Datasheet(s):

EN Dual 4-Phase + 1-Phase PWM Controller for VR12/IMVP7 Applications

Tools And Support

iSim Design Simulation

No Models Available

Application Block Diagrams

Blade PC

Game Console

Related Devices   **PT** Parametric Table

ISL6353	Multiphase PWM Regulator for VR12 DDR Memory Systems
ISL6363	Multiphase PWM Regulator for VR12™ Desktop CPUs
ISL6364C	Dual 4-Phase + 1-Phase PWM Controller for VR12 Desktop Applications
ISL6366	Dual 6-Phase + 1-Phase PWM Controller for VR12/IMVP7 Applications
ISL95831	3+1 Voltage Regulator for IMVP-7/VR12 CPUs
ISL95835	3+1 and 1+1 Voltage Regulator for IMVP-7/VR12™ CPUs
ISL95837	3+1 and 1+1 Voltage Regulator for IMVP-7/VR12™ CPUs

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