ISL68312

Scalable Single Output Digital PWM Controller with Integrated Driver and PMBus

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The ISL68312 is a PMBus compliant, single-phase digital DC/DC controller optimized for use with discrete MOSFETs.

The ISL68312 uses the Renesas fully digital ChargeMode™ control modulation scheme to achieve both industry leading performance and ease of use. ChargeMode control provides an inherently stable control loop that can respond to load transients in a single switching cycle and significantly decrease output capacitor requirements.

A dedicated current share bus allows for paralleling up to eight devices in a current share configuration to provide support for a wide range of load currents.

The ISL68312 is capable of complex sequencing and fault spreading in conjunction with many other Renesas digital controllers. The Digital-DC™ (DDC) bus is a single-wire serial bus that provides high performance inter-device communication without the need for external sequencers and reduces overall system costs.

The PMBus interface facilitates device configuration, and provides supply telemetry and detailed fault reporting including a parametric capture tool (SnapShot). All of these features are conveniently accessible through the PowerNavigator™ software tool. Additionally, a wide array of common configuration options are independently configurable through use of pin-strap resistors.

The ISL68312 supports a comprehensive fault management system with dedicated hardware support for cycle-by-cycle overcurrent, overvoltage, undervoltage, and temperature faults. The configurable fault response system can latch off or restart the output on a fault-by-fault basis. Integrated LDOs for device and gate driver bias allow for single supply operation.

Features

- Unique compensation-free design that is always stable
- Output voltage range: 0.45V to 5.5V
- Input voltage range: 4.75V to 16V or 4.5V to 5.5V
- 0.5% output voltage accuracy over line, load, and temperature
- ChargeMode control achieves fast transient response, reduced output capacitance, and provides output stability without compensation
- Single-channel output can be paralleled with up to eight devices in a single droop-less current sharing output
- Switching frequency range: 200kHz to 1MHz
- Proprietary single-wire DDC serial bus enables voltage sequencing and fault spreading with other Renesas digital power ICs
- Cycle-by-cycle inductor peak current protection
- Digital fault protection for output voltage UV/OV, input voltage UV/OV, and temperature
- Cycle-by-cycle output current measurement with adjustable gain settings for sensing with high current, low DCR inductors
- Monitor ADC measures input voltage, input current, output voltage, and internal temperature
- Nonvolatile memory (NVRAM) for storing operating parameters and fault events
- PMBus compliant, supports 108 PMBus commands

Applications

- Servers and storage equipment
- Telecom and datacom equipment
- Power supplies (FPGA, ASIC, DSP, memory)

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