

Hot-Swap N+1 Redundant XPhase® Controller for High-Reliability DC/DC

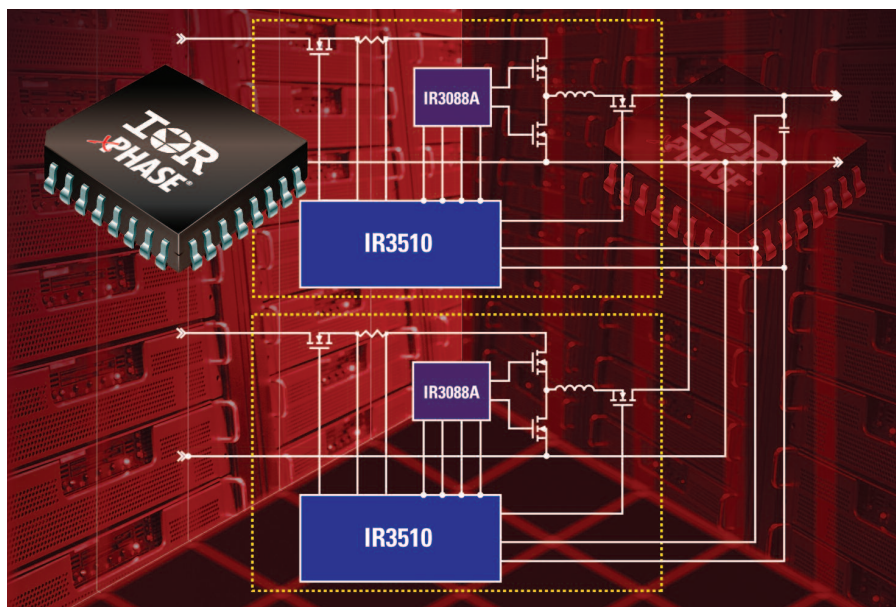
IR3510/IR3088A CHIPSET FEATURES:

- Input isolation control for hot-swap applications
- Output OR-ing capability for N+1 redundant applications
- Gen 2 XPhase® PWM control Architecture

APPLICATIONS:

- High-availability CPUs
- High-end Servers
- Hot-Swap voltage regulators
- N+1 Redundant voltage regulators

This chipset combination results in an ideal solution for powering high-availability CPUs and servers in fault tolerant applications where live insertion is required.



International Rectifier's N+1 redundant POL technology sets new standards in DC-DC converters by maximizing system uptime and reliability. The Hot-Swap N+1 redundant XPhase® Controller, IR3510, combines input isolation control for hot-swap applications along with XPhase® VRM/VRD control and output OR-ing capability for N+1 redundant applications. It also interfaces directly with a microcontroller and XPhase® phase ICs to provide a full featured VRM control, including soft-start, voltage regulation, constant current limit, remote sense and open sense leads protection and is a flexible multi-phase solution. The IR3510 is ideal for powering high-availability CPUs and servers in fault tolerant applications where live insertion is required.

Hot-Swap N+1 redundant AC-DC and DC-DC converters using transformer based power topologies have been available for many years to provide board level bulk power in server, telecommunication and Netcom systems, however, transformer based topologies are no longer a viable solution for directly powering digital ICs due to decreasing digital IC operating voltage, related increases in current, and the proliferation of the number of required power rails. Until now, POLs have been unable to provide N + 1 redundant power along with the required input to output isolation.

The new hot-swap N+1 redundant POL power converter technology based upon the new IR3510 XPhase® Control IC implements a simple and efficient synchronous buck topology combined with input MOSFETs for hot-swapping and output MOSFETs for ORing to ensure complete system protection against failures such as high or low side FET short

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circuit. To maximize MTBF average current mode control is used to implement droop sharing between converters without any single point failure modes. The topology is fully scalable to support output current above 300A and output voltage less than 1V.

About XPhase® Architecture

XPhase® is IR's distributed multiphase architecture that consists of control ICs and phase ICs that communicate using a simple five-wire bus scheme. Phases can be added or removed without changing the fundamental design. The five-wire analog bus consists of bias voltage, phase timing, average current, error amplifier output and VID voltage. By eliminating point-to-point wiring between the control and the phase ICs, the five-wire bus shortens interconnections, and reduces parasitic inductance and noise. This simplifies PCB layout and gives a more robust design.

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