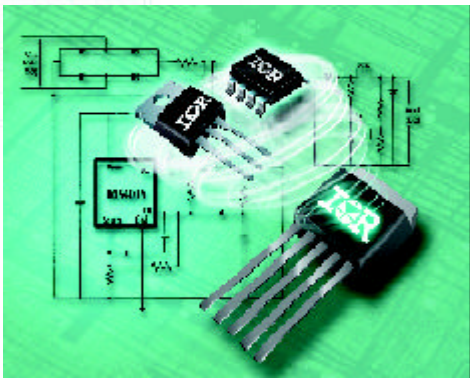
IRIS INTEGRATED SWITCHERS

THE IR ADVANTAGE

- Improve efficiency by up to 4.5% compared to industry-best integrated devices with equivalent ratings
- Improve efficiency by 1.5% compared to a discrete solution with equivalent MOSFET ratings
- Cut PCB area and component count by 25% compared to discrete-based circuits
- <1W stand-by power meets Blue Angel requirements

APPLICATIONS

- Universal and single input, AC-DC and DC-DC SMPS
- 30 to 180W flyback converters
- Monitors, adaptors, DVD players, fax machines, printers, set-top boxes and other high volume consumer applications
- Housekeeping power supplies for large power supplies and motor drives



The IRIS Series integrated switchers combine a low-loss HEXFET® power MOSFET with a dual-mode voltage and current control IC and MOSFET gate drivers in a single 5-pin TO-220 or TO-262 package. The devices are optimized for flyback topologies in universal- and single-input, 30 to 180W switched mode power supplies (SMPS).

Designed to simplify design, decrease cost, and reduce size and weight in high-volume consumer applications, the integrated switchers reduce PCB area and component count by 25% with better efficiency than discrete-based circuits. To allow design flexibility and ruggedness, the IRIS Series integrated switchers include over-voltage protection as well as over-temperature and variable over-current protection.

These devices have an on-resistance ($R_{DS(on)}$) as low as 0.9 Ohm to reduce conduction losses. By combining a rugged, fully characterized avalanche energy HEXFET® power MOSFET and controller IC into a single package, circuit stray inductance due to the PCB and the discrete packages is reduced, which results in lower switching losses at higher PWM frequencies. In-circuit testing demonstrates that IRIS Series integrated switchers improve efficiency by up to 1.5% compared to a discrete solution with equivalent MOSFET ratings and up to 4.5% compared to industry-best devices.

The IRIS Series integrated switchers can operate in either a quasi-resonant or pulse ratio control (PRC) mode. In quasi-resonant mode, switching is done when the drain voltage is at the lowest point of oscillation to reduce switching losses, which increases the overall efficiency at high load conditions. PRC mode is preferred when a low-current standby mode may be required. The IRIS devices can be made to switch between PRC and quasi-resonant modes to achieve higher efficiency and reduced switching losses.

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For technical support call our Technical Assistance Center in
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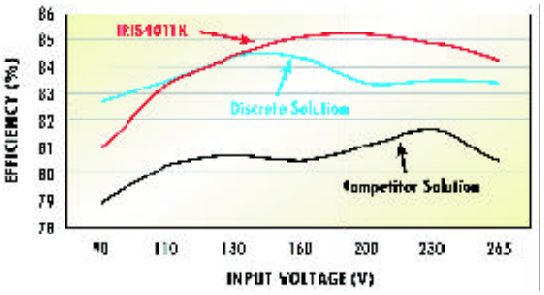
Up to 4.5% Improvement Over Competitor Solutions



FEATURES AT A GLANCE

- MOSFET with controller IC in a single package
- Primary current mode control, and secondary voltage mode control
- Built-in variable frequency oscillator
- Quasi-resonant and pulse-ratio control modes
- Temperature compensated pulse-by-pulse over-current protection (OCP)
- Latched over-voltage protection (OVP)
- Latched thermal shut-down protection (TSD)
- Fully characterized avalanche energy MOSFET
- Low operation circuit current before start-up (100µA max)
- Active low-pass filter for improved stability at light load
- Built-in soft start circuit
- Regulated gate drive
- Adjustable switching speed by external components for EMI control

SPECIFICATIONS

Part Number	Voltage (V)	Package (5-lead)	$R_{DS(on)}$ (Ω)	Max Switching Current (A)	Power Output (Closed Frame) (W)	Power Output (Open Frame) (W)
AC-DC						
IRIS4009	650	TO-220	8	1.25	15	30
IRIS4009K	650	TO-262	8	1.25	15	30
IRIS4011	650	TO-220	3.95	2.5	30	60
IRIS4011K	650	TO-262	3.95	2.5	30	60
IRIS4013	650	TO-220	1.95	5.1	60	120
IRIS4013K	650	TO-262	1.95	5.1	60	120
IRIS4015	650	TO-220	0.9	8	100	180
IRIS4015K	650	TO-262	0.9	8	100	180
DC-DC						
IRIS4007	200	TO-220	0.4	4	N/A	30
IRIS4007K	200	TO-262	0.4	4	N/A	30

IRISMPS3

Fully Tested and Documented Reference Designs

Part Number	IC	Description
IRISMPS1	IRIS4007	DC-DC Flyback Power Supply, 48V input, $5V_{OUT}$, 5A I_{OUT}
IRISMPS2	IRIS4011	AC-DC Flyback Power Supply, Universal input, $12V_{OUT}$, 2A I_{OUT}
IRISMPS3	IRIS4013	AC-DC Flyback Power Supply, Universal input, $15V_{OUT}$, 4A I_{OUT}

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