Smart rectifier

What is smartrectifiertm?

IR's SmartRectifierTM family offers simple high eficiency secondary side synchronous rectificationfor all operating modes over a broad array of topologies. IR1163 is a smart secondary-side driver IC designed to drive N-Channel power MOSFETs used as synchronous rectifiers in isolated Flyback,Forward,LLC,Half-bridge or full-bridge converters.

Can a bridge rectifier be replaced with a MOSFET?

In a full bridge rectifier,each diode can be replaced by the LM74670-Q1 and a MOSFET. Diodes used in bridge rectifiers cause high power losses associated with the forward voltage drop of each diode. In each cycle of sinusoidal AC voltage,two diodes conduct at the same time.

How does the smartrectifiertm control technique work?

The SmartRectifierTM Control Technique is based on sensing the voltage across the MOSFET and comparing it with two negative thresholds to determine the turn on and off transition for the device. A higher negative threshold, VTH2, detects current through the body diode and hence, controls the turn on transition for the power device.

How a MOSFET senses a rectifier current?

The rectifier current is sensed by the input comparator using the power MOSFET RDSon as a shunt resistanceand the GATE pin of the MOSFET is driven accordingly depending on the level of the sensed voltage with respect to the 3 thresholds shown in Figure 3.

8.1 Typical Rectifier Application The LM74670-Q1 can be used with appropriate N-channel MOSFET to replace a diode in a typical rectifier application. The rectifier could be industrial ...

The IR1168(2) is a dual smart secondary-side rectifier driver IC designed to drive two N-Channel power MOSFETs used as synchronous rectifiers in resonant converter applications.

For the first time, a smart power synchronous rectifier (SPSR), which is a two-terminal MOS rectifier, is designed to overcome this difficulty. The SPSR integrates a simple control unit with a power ...

This smart function is implemented by a fast cycle-after-cycle logic control mechanism, based on a high

frequency oscillator, synchronized by the clock signal. This anticipation is externally ...

The integration of smart technology in half wave rectifier design presents several technical challenges that need to be addressed. One of the primary obstacles is the efficient conversion of ...

A monolithically integrated smart rectifier has been presented first in this work. The smart rectifier, which integrates a power MOSFET, gate driver and control circuitry, operates in a self-synchronized ...

References [1] IR1167S Smart Rectifier control IC datasheet, International Rectifier, February 2006 [2] M.T. Zhang, M. Jovanovic, F. Lee, "Design considerations and performance ...

The MP6923 is a dual, fast turn-off, intelligent rectifier for synchronous rectification in LLC resonant converters. The IC drives two N-channel MOSFETs and regulates their forward voltage drop to about ...

The IR1169 high speed synchronous rectifier (SR) controller from International Rectifier suits flyback, forward and half-bridge converters used in AC-DC adapter, PC, server and Telecom ...

Description The STRG02 smart driver implements a control scheme specific to secondary-side synchronous rectification in STVCOT TM based resonant converters.

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