

FSDL0165RN

Green Mode Fairchild Power Switch (FPS™)

Features

- Internal Avalanche Rugged Sense FET
- Consumes only 0.65W at 240VAC & 0.3W load with Advanced Burst-Mode Operation
- Frequency Modulation for low EMI
- Precision Fixed Operating Frequency
- Internal Start-up Circuit
- Pulse by Pulse Current Limiting
- Abnormal Over Current Protection
- Over Voltage Protection
- Over Load Protection
- Internal Thermal Shutdown Function
- Auto-Restart Mode
- Under Voltage Lockout
- Low Operating Current (3mA)
- Adjustable Peak Current Limit
- Built-in Soft Start

Applications

- SMPS for VCR, SVR, STB, DVD & DVCD
- SMPS for Printer, Facsimile & Scanner
- Adaptor for Camcorder

Description

The FSDL0165RN is an integrated Pulse Width Modulator (PWM) and Sense FET specifically designed for high performance offline Switch Mode Power Supplies (SMPS) with minimal external components. This device is an integrated high voltage power switching regulator which combine an avalanche rugged Sense FET with a current mode PWM control block. The integrated PWM controller features include: a fixed oscillator with frequency modulation for reduced EMI, Under Voltage Lock Out (UVLO) protection, Leading Edge Blanking (LEB), optimized gate turn-on/turn-off driver, Thermal Shut Down (TSD) protection, Abnormal Over Current Protection (AOCP) and temperature compensated precision current sources for loop compensation and fault protection circuitry. When compared to a discrete MOSFET and controller or RCC switching converter solution, the FSDL0165RN reduce total component count, design size, weight and at the same time increases efficiency, productivity, and system reliability. This device is a basic platform well suited for cost effective designs of flyback converters.

OUTPUT POWER TABLE				
PRODUCT	230VAC ±15% ⁽³⁾		85-265VAC	
	Adapt-er ⁽¹⁾	Open Frame ⁽²⁾	Adapt-er ⁽¹⁾	Open Frame ⁽²⁾
FSDL321	11W	17W	8W	12W
FSDH321	11W	17W	8W	12W
FSDL0165RN	13W	23W	11W	17W
FSDM0265RN	16W	27W	13W	20W
FSDH0265RN	16W	27W	13W	20W
FSDL0365RN	19W	30W	16W	24W
FSDM0365RN	19W	30W	16W	24W
FSDL321L	11W	17W	8W	12W
FSDH321L	11W	17W	8W	12W
FSDL0165RL	13W	23W	11W	17W
FSDM0265RL	16W	27W	13W	20W
FSDH0265RL	16W	27W	13W	20W
FSDL0365RL	19W	30W	16W	24W
FSDM0365RL	19W	30W	16W	24W

Table 1. Notes: 1. Typical continuous power in a non-ventilated enclosed adapter measured at 50°C ambient. 2. Maximum practical continuous power in an open frame design at 50°C ambient. 3. 230 VAC or 100/115 VAC with doubler.

Typical Circuit

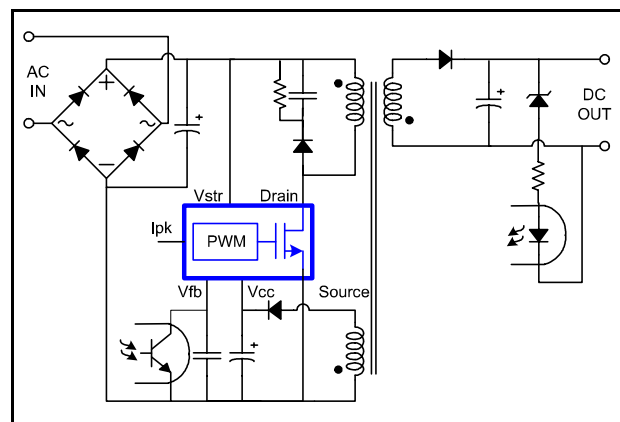


Figure 1. Typical Flyback Application

Internal Block Diagram

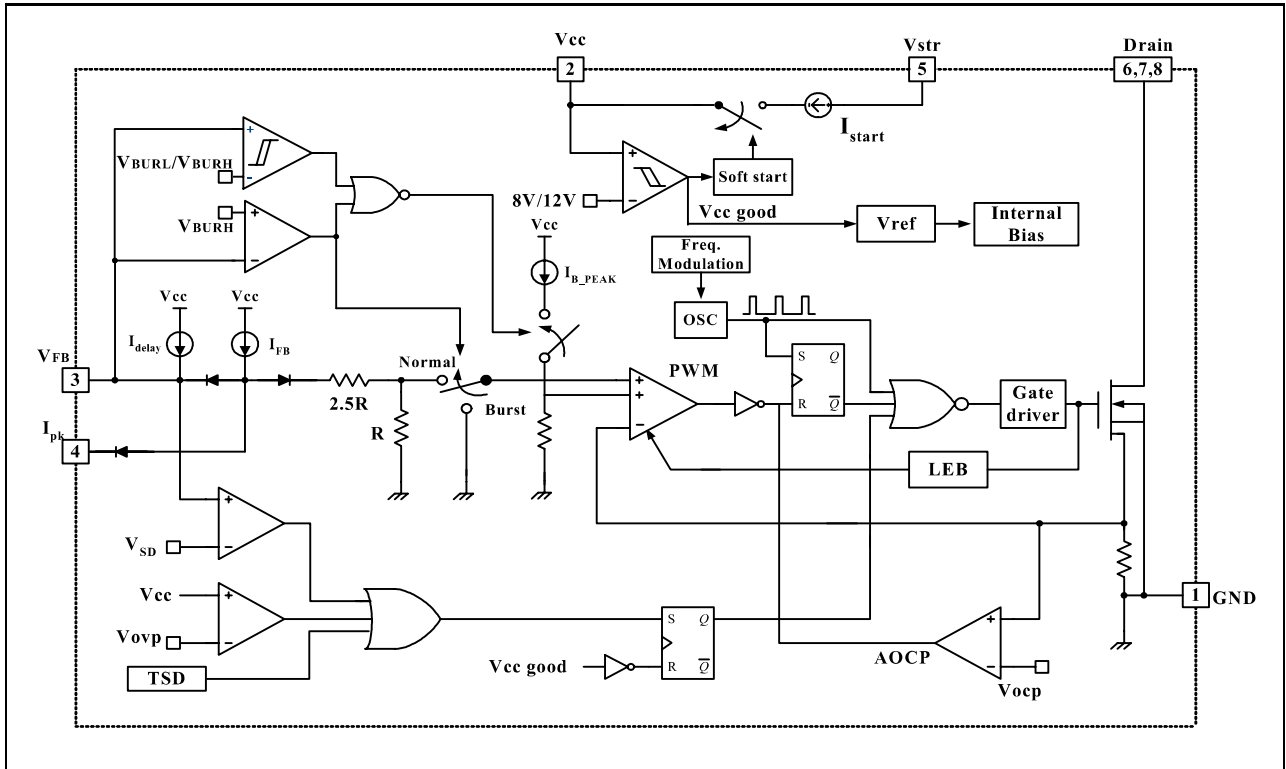


Figure 2. Functional Block Diagram of FSDL0165RN

Pin Definitions

Pin Number	Pin Name	Pin Function Description
1	GND	Sense FET source terminal on primary side and internal control ground.
2	Vcc	Positive supply voltage input. Although connected to an auxiliary transformer winding, current is supplied from pin 5 (Vstr) via an internal switch during startup (see Internal Block Diagram section). It is not until Vcc reaches the UVLO upper threshold (12V) that the internal start-up switch opens and device power is supplied via the auxiliary transformer winding.
3	Vfb	The feedback voltage pin is the non-inverting input to the PWM comparator. It has a 0.9mA current source connected internally while a capacitor and optocoupler are typically connected externally. A feedback voltage of 6V triggers over load protection (OLP). There is a time delay while charging between 3V and 6V using an internal 5uA current source, which prevents false triggering under transient conditions but still allows the protection mechanism to operate under true overload conditions.
4	l _{pk}	Pin to adjust the current limit of the Sense FET. The feedback 0.9mA current source is diverted to the parallel combination of an internal 2.8kΩ resistor and any external resistor to GND on this pin to determine the current limit. If this pin is tied to Vcc or left floating, the typical current limit will be 1.2A.
5	Vstr	This pin connects directly to the rectified AC line voltage source. At start up the internal switch supplies internal bias and charges an external storage capacitor placed between the Vcc pin and ground. Once the Vcc reaches 12V, the internal switch is disabled.
6, 7, 8	Drain	The Drain pin is designed to connect directly to the primary lead of the transformer and is capable of switching a maximum of 650V. Minimizing the length of the trace connecting this pin to the transformer will decrease leakage inductance.

Pin Configuration

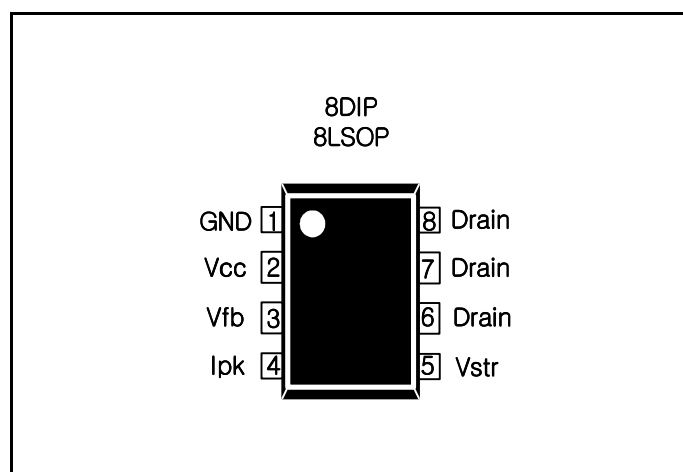


Figure 3. Pin Configuration (Top View)