TOP221-227

TOPSwitch®-II Family

Three-terminal Off-line PWM Switch

Product Highlights

- Lowest cost, lowest component count switcher solution
- Cost competitive with linears above 5W
- Very low AC/DC losses – up to 90% efficiency
- Built-in Auto-restart and Current limiting
- Latching Thermal shutdown for system level protection
- Implements Flyback, Forward, Boost or Buck topology
- Works with primary or opto feedback
- Stable in discontinuous or continuous conduction mode
- Source connected tab for low EMI
- Circuit simplicity and Design Tools reduce time to market

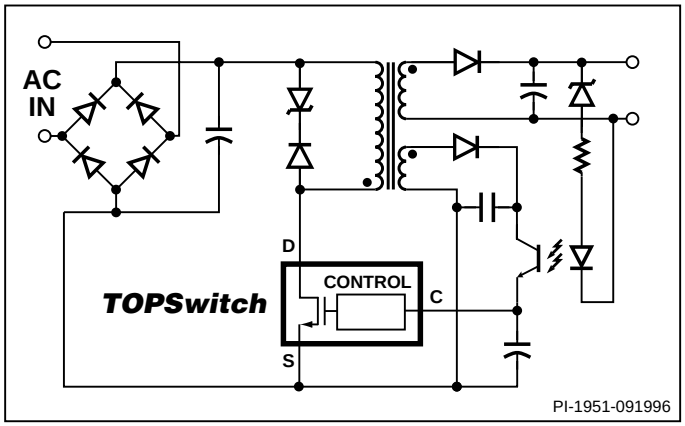

Figure 1. Typical Flyback Application.

Description

The second generation *TOPSwitch-II* family is more cost effective and provides several enhancements over the first generation *TOPSwitch* family. The *TOPSwitch-II* family extends the power range from 100W to 150W for 100/115/230 VAC input and from 50W to 90W for 85-265 VAC universal input. This brings *TOPSwitch* technology advantages to many new applications, i.e. TV, Monitor, Audio amplifiers, etc. Many significant circuit enhancements that reduce the sensitivity to board layout and line transients now make the design even easier. The standard 8L PDIP package option reduces cost in lower power, high efficiency applications. The internal lead frame of this package uses six of its pins to transfer heat from the chip directly to the board, eliminating the cost of a heat sink. *TOPSwitch* incorporates all functions necessary for a switched mode control system into a three terminal monolithic IC: power MOSFET, PWM controller, high voltage start up circuit, loop compensation and fault protection circuitry.

OUTPUT POWER TABLE

TO-220 (Y) Package[1]			8L PDIP (P) or 8L SMD (G) Package[2]		
PART ORDER NUMBER	Single Voltage Input[3] 100/115/230 VAC ±15% P_{MAX}[4,6]	Wide Range Input 85 to 265 VAC P_{MAX}[4,6]	PART ORDER NUMBER	Single Voltage Input[3] 100/115/230 VAC ±15% P_{MAX}[5,6]	Wide Range Input 85 to 265 VAC P_{MAX}[5,6]
TOP221Y	12 W	7 W	TOP221P or TOP221G	9 W	6 W
TOP222Y	25 W	15 W	TOP222P or TOP222G	15 W	10 W
TOP223Y	50 W	30 W	TOP223P or TOP223G	25 W	15 W
TOP224Y	75 W	45 W	TOP224P or TOP224G	30 W	20 W
TOP225Y	100 W	60 W			
TOP226Y	125 W	75 W			
TOP227Y	150 W	90 W			

Notes: **1**. Package outline: TO-220/3 **2**. Package Outline: DIP-8 or SMD-8 **3.** 100/115 VAC with doubler input **4**. Assumes appropriate heat sinking to keep the maximum *TOPSwitch* junction temperature below 100 °C. **5**. Soldered to 1 sq. in.(6.45 cm^2), 2 oz. copper clad (610 gm/m^2) **6**. P_{MAX} is the maximum practical continuous power output level for conditions shown. The continuous power capability in a given application depends on thermal environment, transformer design, efficiency required, minimum specified input voltage, input storage capacitance, etc. **7**. Refer to key application considerations section when using *TOPSwitch-II* in an existing *TOPSwitch* design.

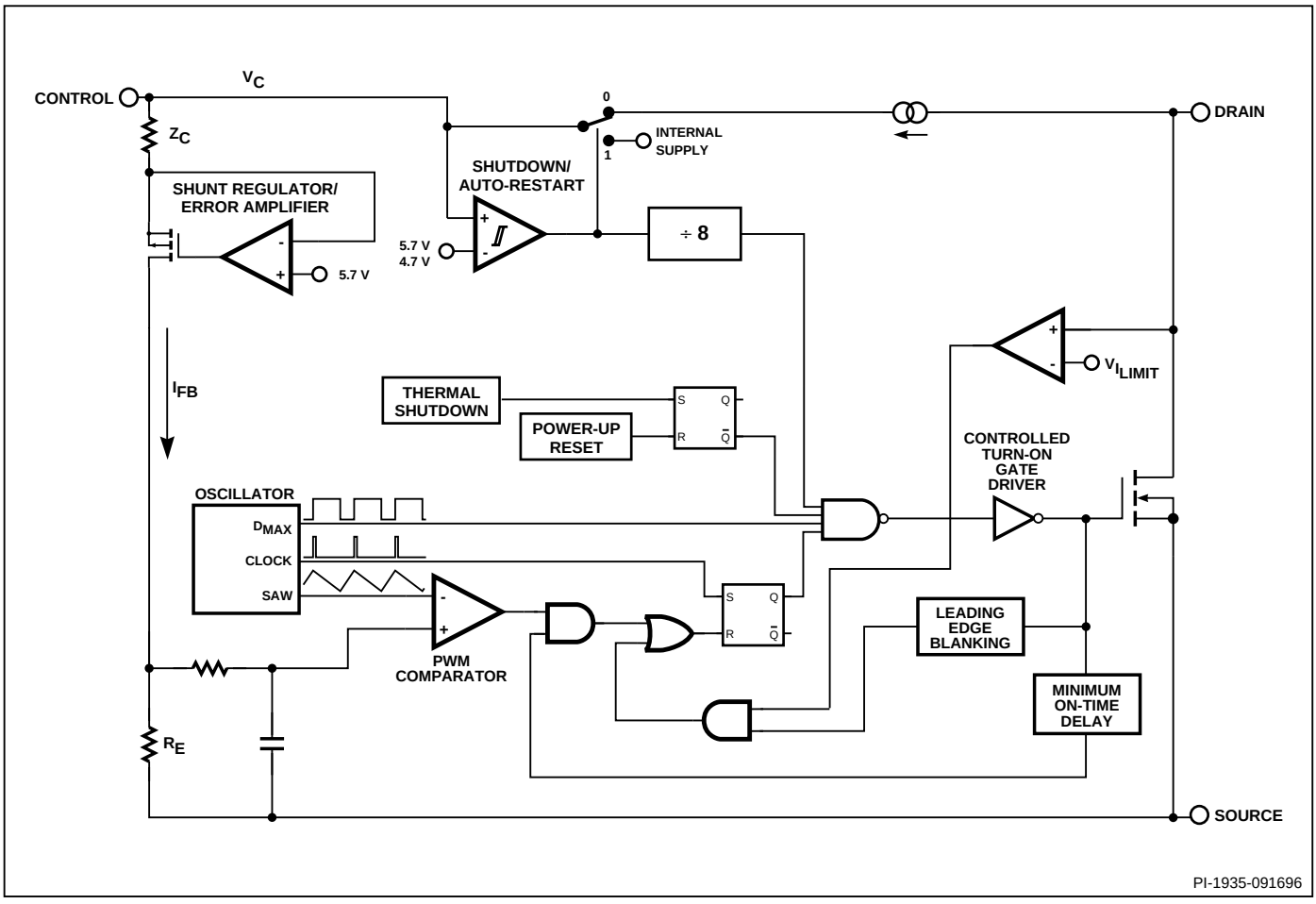

Figure 2. Functional Block Diagram.

Pin Functional Description

DRAIN Pin:
Output MOSFET drain connection. Provides internal bias current during start-up operation via an internal switched high-voltage current source. Internal current sense point.

CONTROL Pin:
Error amplifier and feedback current input pin for duty cycle control. Internal shunt regulator connection to provide internal bias current during normal operation. It is also used as the connection point for the supply bypass and auto-restart/ compensation capacitor.

SOURCE Pin:
Y package – Output MOSFET source connection for high voltage power return. Primary side circuit common and reference point.

P and G package – Primary side control circuit common and reference point.

SOURCE (HV RTN) Pin: (P and G package only)
Output MOSFET source connection for high voltage power return.

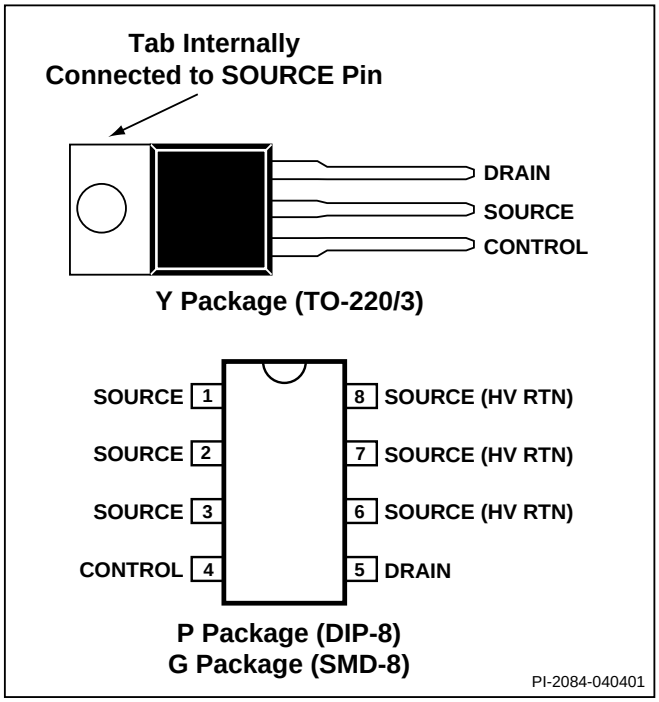

Figure 3. Pin Configuration.