

η -Balance™ PWM Power Switch Fixed 50KHz Fsw

FEATURES

- ◆ Built-in 600V Power MOSFET
- ◆ Proprietary η -Balance™ Control to Boost Light Load Efficiency
- ◆ Proprietary “Zero OCP/OPP Recovery Gap” Control
- ◆ Fixed 50KHz Switching Frequency
- ◆ Built-in Soft Start Function
- ◆ Very Low Startup Current
- ◆ Frequency Reduction and Burst Mode Control for Energy Saving
- ◆ Current Mode Control
- ◆ Built-in Frequency Shuffling
- ◆ Built-in Synchronous Slope Compensation
- ◆ Cycle-by-Cycle Current Limiting
- ◆ Built-in Leading Edge Blanking (LEB)
- ◆ Constant Power Limiting
- ◆ Pins Floating Protection
- ◆ Audio Noise Free Operation
- ◆ VDD OVP & Clamp
- ◆ VDD Under Voltage Lockout (UVLO)

APPLICATIONS

Offline AC/DC Flyback Converter for

- ◆ AC/DC Adaptors
- ◆ Open-frame SMPS
- ◆ Set-Top Box Power Supplies
- ◆ ATX Standby Power

GENERAL DESCRIPTION

SF1533 is a high performance, high efficiency, highly integrated current mode PWM power switch for offline flyback converter applications.

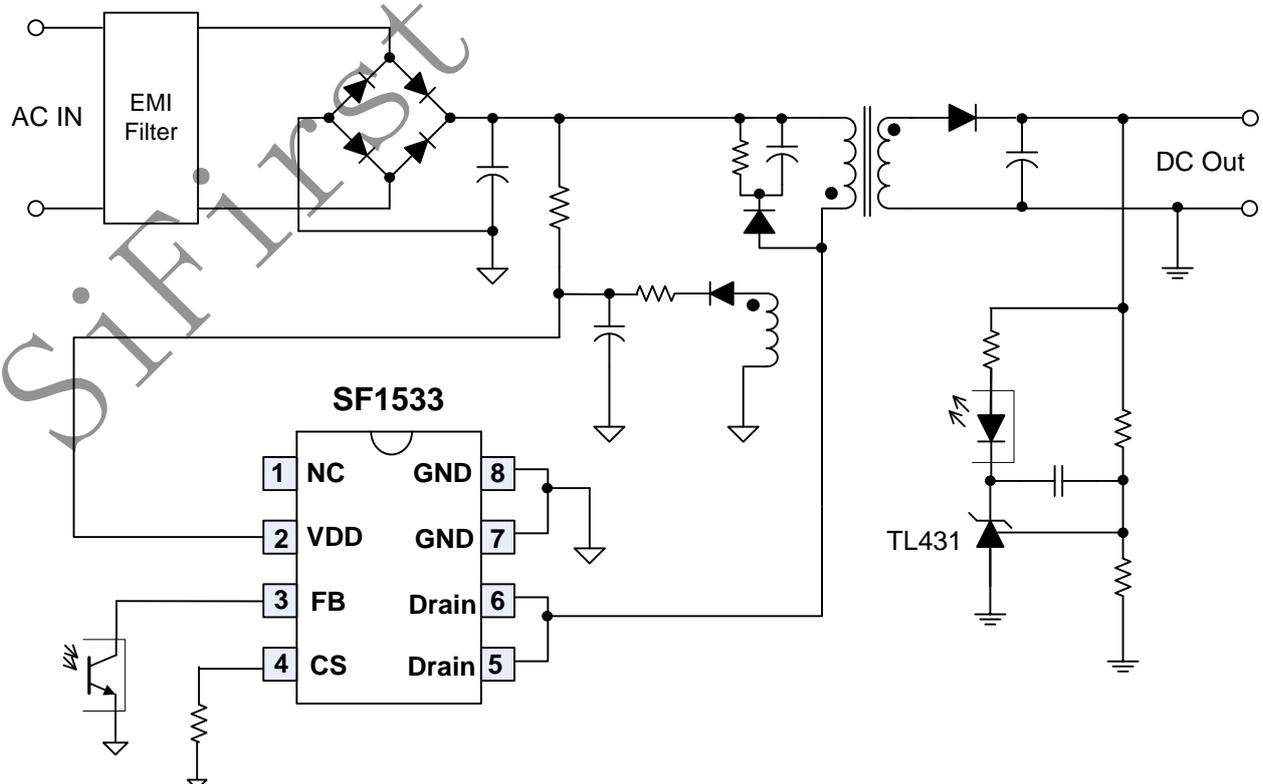
In SF1533, PWM switching frequency with shuffling is fixed to 50KHz and is trimmed to tight range. When the output power demands decrease, the IC decreases switching frequency based on the proprietary η -Balance™ control to boost power conversion efficiency at the light load. When output power falls below a given value, the IC enters into burst mode and provides excellent efficiency without audio noise.

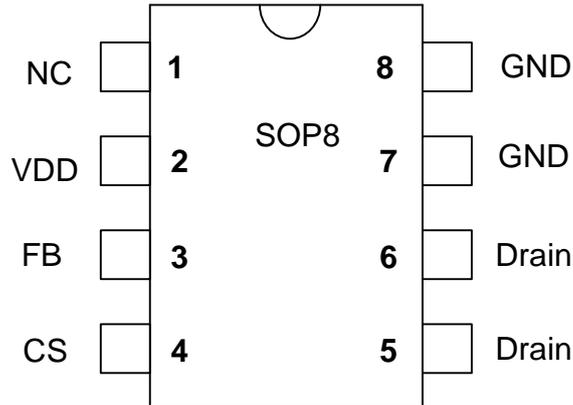
The IC can achieve “Zero OCP/OPP Recovery Gap” using SiFirst’s proprietary control algorithm. Meanwhile, the OCP/OPP variation versus universal line input is compensated.

The IC has built-in synchronized slope compensation to prevent sub-harmonic oscillation at high PWM duty output. The IC also has built-in soft start function to soften the stress on the MOSFET during power on period.

SF1533 integrates functions and protections of Under Voltage Lockout (UVLO), VCC Over Voltage Protection (OVP), Cycle-by-cycle Current Limiting (OCP), Pins Floating Protection, Over Load Protection (OLP), VCC Clamping, Leading Edge Blanking (LEB), etc.

SF1533 is available in SOP8 packages.

TYPICAL APPLICATION


Pin Configuration

Ordering Information

| Part Number | Top Mark | Package | | Tape & Reel |
|-------------|----------|---------|-------|-------------|
| SF1533SG | SF1533SG | SOP8 | Green | |
| SF1533SGT | SF1533SG | SOP8 | Green | Yes |

Output Power Table⁽¹⁾

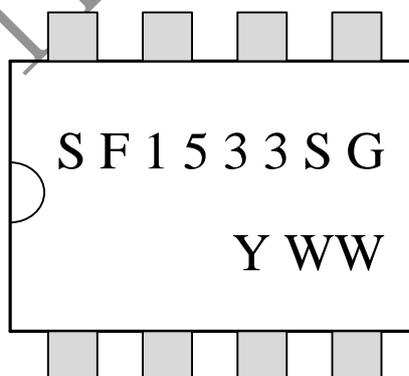
| Part Number | 230VAC \pm 15% ⁽²⁾ | 85-265VAC |
|-------------|---------------------------------|------------------------|
| | Adapter ⁽³⁾ | Adapter ⁽³⁾ |
| SF1533 | 7W | 5.5W |

Note 1. The Max. output power is limited by junction temperature

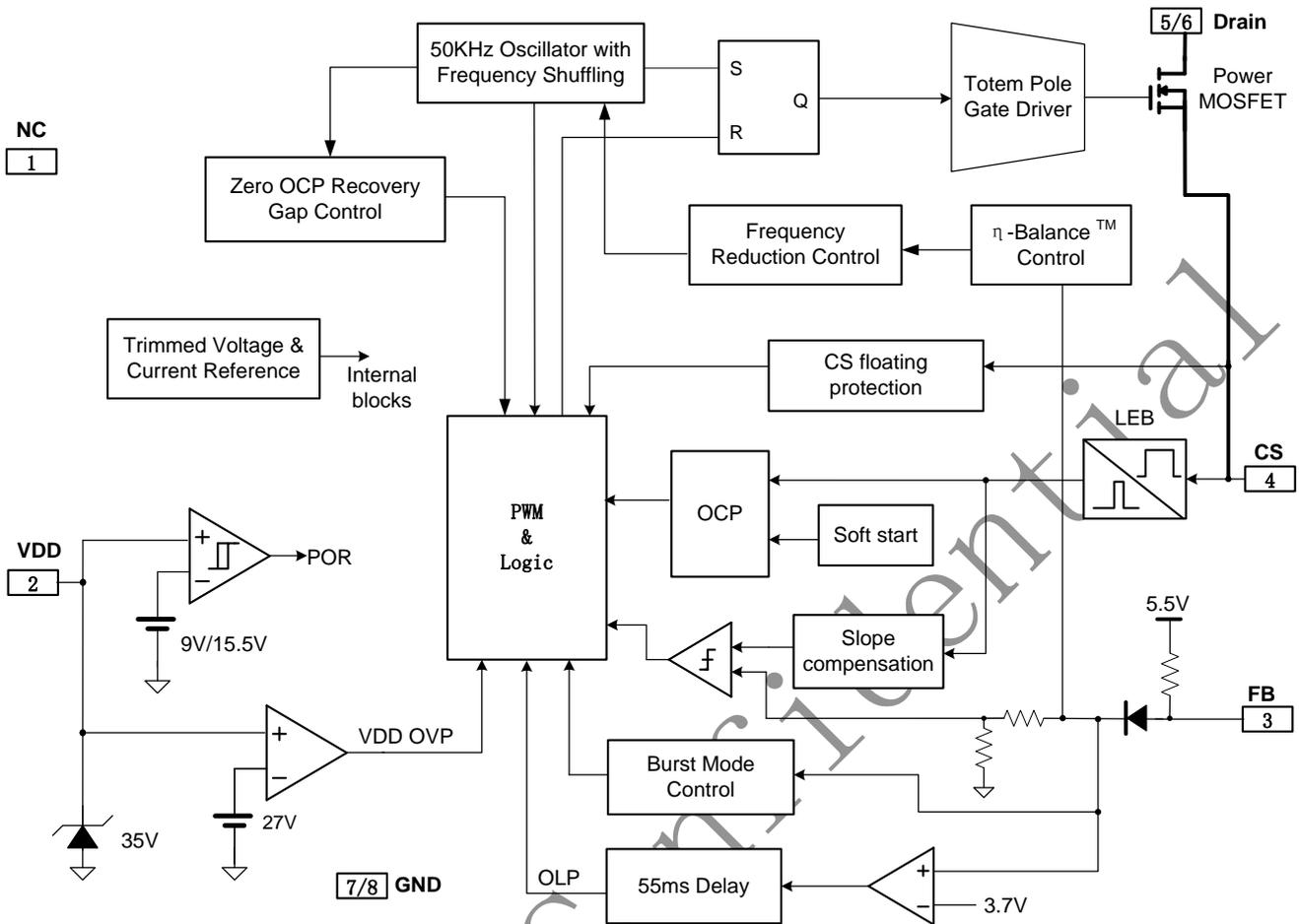
Note 2. 230VAC or 100/115VAC with doublers

Note 3. Typical continuous power in a non-ventilated enclosed adapter with sufficient drain pattern as a heat sink at 50°C ambient.

Note 4. Max. practical continuous power in a open-frame design with sufficient drain pattern as a heat sink at 50°C ambient.

Marking Information


YWW: Year&Week code

Block Diagram

Pin Description

| Pin Num | Pin Name | I/O | Description |
|---------|----------|-----|--|
| 1 | NC | -- | No connect. |
| 2 | VDD | P | IC power supply pin. |
| 3 | FB | I | Voltage feedback pin. The loop regulation is achieved by connecting a photo-coupler to this pin. PWM duty cycle is determined by this pin voltage and the current sense signal at Pin 4. |
| 4 | CS | I | Current sense input pin. |
| 5-6 | Drain | P | High voltage power MOSFET drain connection. |
| 7-8 | GND | P | Ground. |

Absolute Maximum Ratings (Note 5)

| Parameter | Value | Unit |
|--|-------------|------|
| VDD DC Supply Voltage | 35 | V |
| VCC DC Clamp Current | 10 | mA |
| Drain pin | -0.3 to 600 | V |
| FB, CS voltage range | -0.3 to 7 | V |
| Package Thermal Resistance (SOP-8) | 150 | °C/W |
| Maximum Junction Temperature | 150 | °C |
| Operating Temperature Range | -40 to 85 | °C |
| Storage Temperature Range | -65 to 150 | °C |
| Lead Temperature (Soldering, 10sec.) | 260 | °C |
| ESD Capability, HBM (Human Body Model) | 3 | kV |
| ESD Capability, MM (Machine Model) | 250 | V |