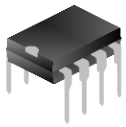
Built-in high-voltage power switch current mode **PWM+PFM** Controller series

description

SD6830 Is a highly integrated current mode PWM+PFM Control chip. Built-in oscillator, built-in high-voltage tube and frequency reduction function, IC With complete self-recovery protection function. The power controller works in a typical flyback topology circuit, which constitutes a concise AC/DC Power converter. in

85V-265V Available in a wide voltage range 12W of Continuous output power.



DIP-8-300-2.54

main feature

- Built-in oscillator
- **Built-in 700V High voltage power switch**
- Quick high pressure start
- Low starting current and low operating current
- Green frequency reduction function, low standby power consumption
- **Comprehensive self-recovery protection functions: overvoltage, undervoltage, short circuit, overload and overtemperature protection**
- Accurate temperature compensation, precise cycle-by-cycle current control
- **Wide voltage output power 12W , Peak output 15W**
- **High voltage output power 15W , Peak output 18W**
- Fewer peripheral components, low overall cost

application

- Power Adapter
- battery charger
- Portable charging power
- Home appliance controller power supply
- DVD/DVB power supply
- ATX Standby power

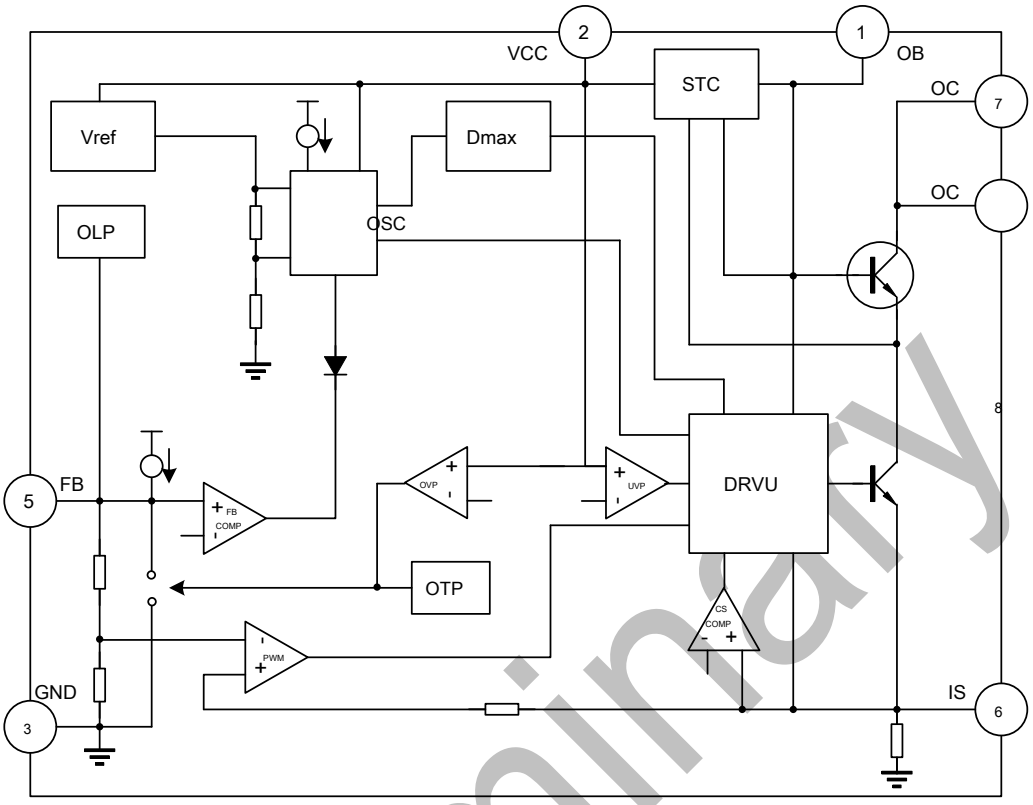
Product specification classification

product name	Package type	Print name	material	package
SD6830	DIP-8-300-2.54	SD6830	Lead-free	Feed tube

Typical output power capability

product	190~265V		85~265V	
	adapter	Open	adapter	Open
SD6830	12W	15W	10W	12W

Internal block diagram



Limit parameter

Ginseng number	symbol	Parameter range	unit
OC Collector withstand voltage	$V_{OC,MAX}$	700	V
Peak switching current	$I_{OC,MAX}$	1	A
Supply voltage	$V_{CC,MAX}$	18	V
Total power dissipation	P_D	1	W
Operating temperature	T_{ORG}	-20~+85	° C
Storage temperature	T_{STG}	-55~+150	° C
Welding temperature	T_W	+260,10s	° C

Note: 1. The pulse width is determined by the maximum junction temperature;

2. L=51mH , T_J= 25 ° C(Start).

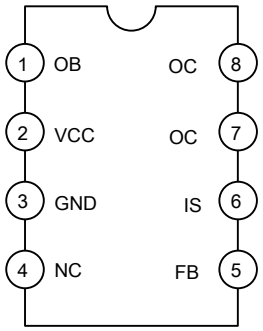
Recommended working conditions

Ginseng number	symbol	Minimum value	Typical value	Maximum	unit
OC Collector withstand voltage	V_{OC}	--	--	600	V
Peak switching current	I_{OC}	--	--	0.8	A
Supply voltage	V_{CC}	5	6	12	V

Electrical parameters (unless otherwise specified, T_a= 25 ° C , V_{CC}= 7.0V , R_{IS}= 1 Ω)

Ginseng number	symbol	Test Conditions	Minimum Typica	Value Maximum Unit		
Output section						
Switch tube maximum withstand voltage	V_{OCM}	V_{CC}= 0V, I_{OC}= 2mA	700	-	-	V
Turn on saturation pressure drop	V_{OCS}	I_{OC}= 600mA	-	-	1	V
Output rise time	T_R	C_L= 1nF	-	-	75	ns
Output fall time	T_F	C_L= 1nF	-	-	75	ns
Switch off delay	T_{OFF}	L_p= 1.2mH	-	500	-	ns
High voltage start current source	I_{CHAGE}		1	-	-	mA
Oscillator section						
Oscillation frequency	f		-	61	-	KHz
Rate of change of frequency with voltage		V_{FB}= 2.5V	-	-	1	%
Frequency change rate with temperature		T_a= 0~85°C	-	-	1	%
Feedback section						
Feedback pull-up current	I_{FB}	V_{FB}= 2.5V	-	0.50	-	mA
Feedback pull-down resistor	R_{FB}		-	13	-	KΩ
Power supply rejection ratio		V_{CC}= 5~9V	-	60	70	dB
Current sampling section						
Current sampling threshold	V_{IS}		-	0.625	-	V
IS Resistance to ground	R_{IS}		-	20	-	Ω
Power supply rejection ratio			-	60	70	dB
Transmission delay	T_{DELAY}		-	150	250	ns
Pulse Width Modulation						
Maximum duty cycle	D_{MAX}	V_{FB} > 4.5V	52	57	62	%
Minimum duty cycle	D_{MIN}		-	1.5	-	%
Power supply current						
Starting quiescent current	I_{OP}		-	15	50	μA
Quiescent Current	I_{SP}	V_{FB}= 0.2V	-	2.8	-	mA
Starting voltage	V_{START}		-	9.0	-	V
Undervoltage protection voltage	V_{STOP}		-	3.45	-	V
Restart voltage	V_{AS}		-	2.1	-	V
Overvoltage protection threshold	V_{OVP}		11.0	12.0	13.0	V

Pin arrangement



Pin description

Pin number	Pin name	I/O	Functional description
1	OB	I	Start power input, external start resistance
2	VCC	I	Power input pin
3	GND	I	Ground pin
4	NC	--	Dangling feet
5	FB	I/O	Feedback foot
6	IS	I/O	Cycle by cycle current sampling pin, external current sampling resistor
7 , 8	OC	O	High voltage switch output pin, connected to transformer primary coil

Functional description

SD6830 Is used in off-line switching power supply integrated circuits. The controller includes an oscillation frequency generator and various protection functions. by IS The terminal resistance can adjust the limit peak current. At light load, the circuit adopts green mode, which can effectively reduce the standby power consumption of the circuit. Protection functions include: undervoltage, overvoltage, overload, short circuit and temperature protection. use SD6830 Can reduce peripheral components, increase efficiency and system reliability.

1. Start control

During the startup phase, the internal reference, oscillator, and various protection circuits did not start working. AC Input electricity Voltage through the starting resistor to give a base current to the power tube, using the amplification function of the transistor, OE The starting current is input by the power tube to VCC . when VCC Voltage reached 9V After the chip starts working, it enters the normal working state.

2. PWM control

VCC Normal operating voltage range 5-9V . The peak current of the switch is determined by FB The voltage is determined. This voltage is generated by the internal resistor divider to generate a reference, and IS Compare ramp voltages to achieve PWM control. At the same time, the output duty cycle is also subject to the limit of the maximum duty cycle. FB The control can be achieved through an internal control circuit and an external feedback circuit.

3. VCC Overvoltage protection

Integrated inside the chip VCC Overvoltage protection circuit, when VCC Voltage is greater than 12V , Through the internal control circuit, put FB The voltage of the foot is pulled down, so as to turn off the output; VCC Voltage back 12V the following, The chip resumes output. This control method, the highest VCC Voltage clamped at 12V ,Guarantee IC Work reliably.

4. Current limit

when IS Of the sampling voltage exceeds the current limit threshold, 0.625V Time, turn off the output and limit the power.

5. Green mode control

Under no load or light load, the output voltage rises, FB When the voltage is lowered, when FB The oscillator period will increase when it drops to a certain value, FB The smaller the oscillator period, the wider the oscillation period until the oscillator stops.

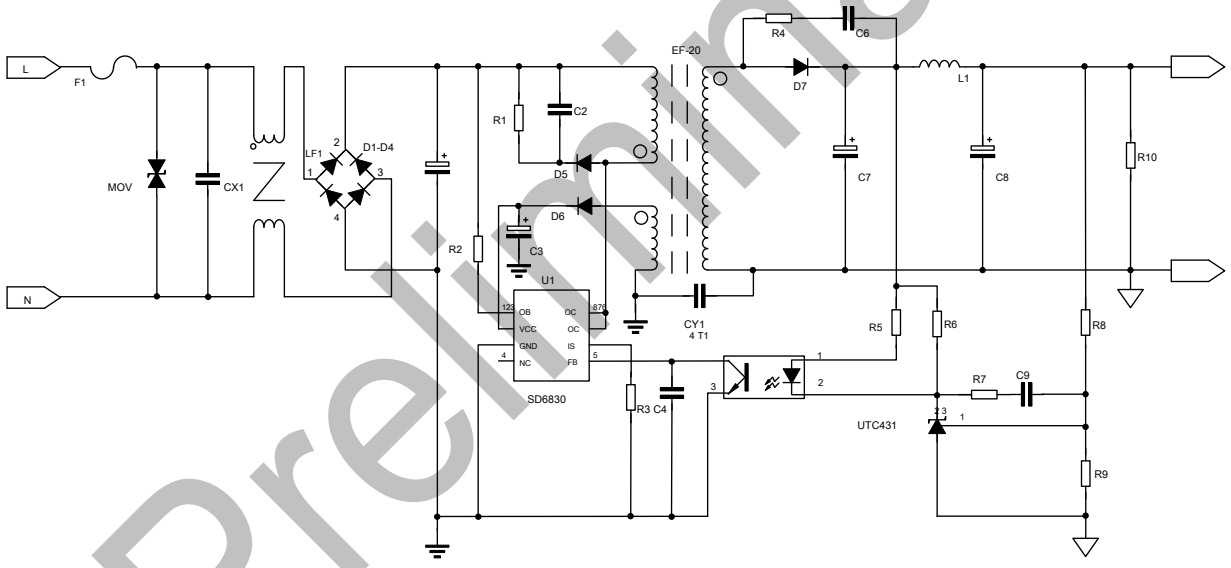
6. Power tube drive

Open cycle, OB Provide base current for power tube, OE Pull down the emitter of the power tube to IS , And the base uses proportional current drive (base drive current is IS As a function of voltage, when the load is reduced, reduce the drive to reduce losses), if IS detected FB The specified current enters the off period; the off period, OB Pull down, turn off the power tube.

7. Over temperature protection

A high-precision temperature protection module is integrated inside the chip. When the internal temperature of the chip is higher than 150°C Later, through the internal control circuit, put FB Pull down the voltage to adjust the period of the oscillator to reduce or turn off the output power so that the chip temperature will not exceed 160°C . Through this control method, the chip is prevented from burning out.

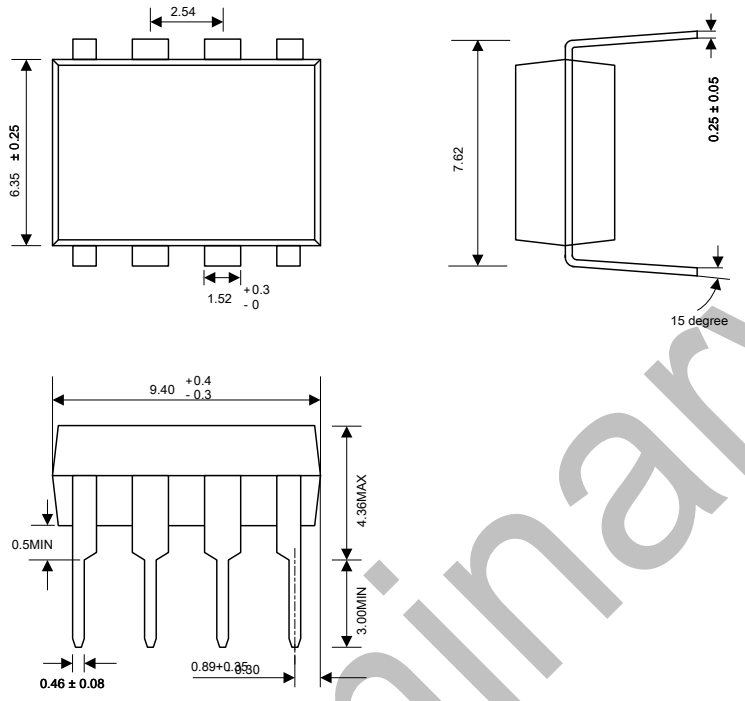
Typical application circuit diagram

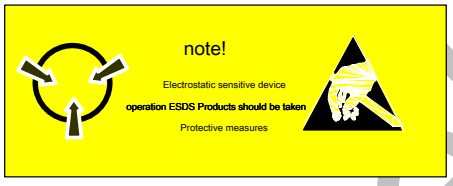


Note: The above lines and parameters are for reference only, please set the parameters on the basis of sufficient actual measurement for the actual application circuit.

Package outline drawing

DIP-8-300-2.54 unit: **mm**





MOS Notes on circuit operation:

Static electricity will be generated in many places. Take the following precautions to effectively prevent MOS Circuit damage due to electrostatic discharge:

- The operator must be grounded through an anti-static wrist strap.
- The device casing must be grounded.
- Tools used during assembly must be grounded.
- Conductor packaging or antistatic materials must be used for packaging or transportation.

statement:

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