



AS1370 High Performance AC Powered LED Lighting Driver

Descriptions

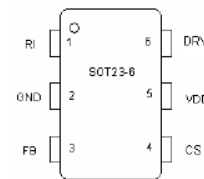
The AS1370 is a highly integrated switching power supply controller optimized for LED solid state lighting applications. The controller provides high efficiency, constant current driver for all 110/220V AC powered LED lighting applications, like T8/T10, E27 and etc. The energy star compliant controller can also be used in high performance battery chargers, AC adapters, Set-Top Box Power Supplies and Open-frame SMPS.

The Leading-edge blanking on current sense (CS) input removes the signal glitch due to snubber circuit diode reverse recovery and thus reduces the RC filtering in the design.

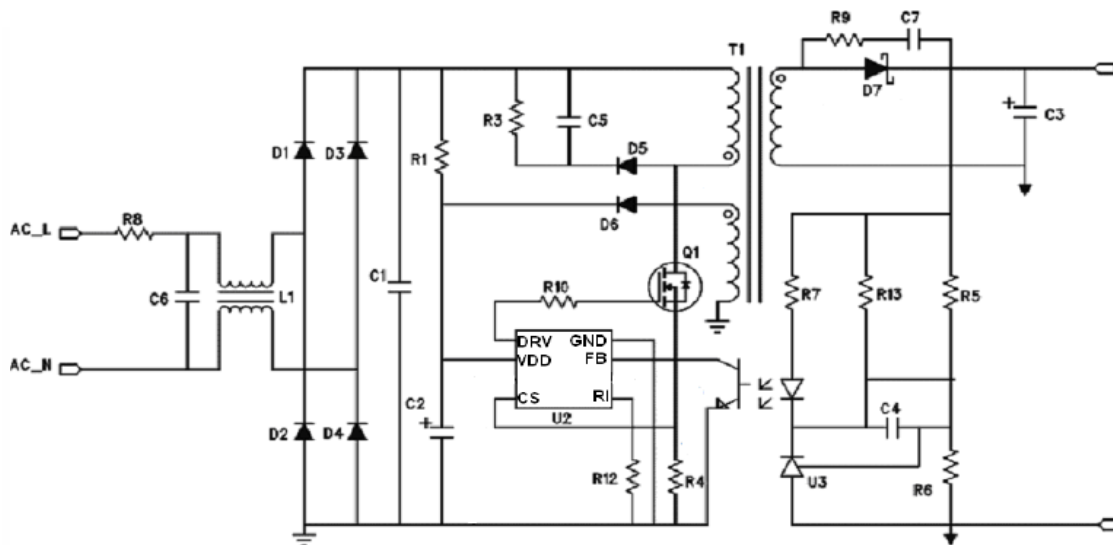
Automatic self-recovery feature including Cycle-by-Cycle over current protection (OCP), over load protection (OLP) and under voltage lockout (UVLO) features. The AC-DC controller also provides short circuit protection function to reduce average short circuit power loss.

General Features

- Energy Star compliance. > 85% IC efficiency
- Output Short-Circuit Protection
- Over current protection
- Under-voltage Lockout
- Over load protection
- Current-Mode with Adjustable Skip-Cycle Capability
- Internal Leading Edge Blanking
- 250mA Peak Current Gate Drive Capability for up to 50W applications.
- Spread spectrum clocking to minimize EMI interference.
- FB direct connect to the opto-coupler
- SOT23-6 package is available



SOT23-6 - Top View



Typical Isolated LED Lighting Application



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Pin	Name	Function
1	RI	Add a resistor on this pin to set the oscillator frequency
2	GND	IC Ground
3	FB	Direct connect to the opto-coupler for controlling the output voltage regulation
4	CS	This pin senses the primary current and routes it to the internal comparator via an L.E.B.
5	VDD	IC Supply. This pin is connected to an external bulk capacitor
6	DRV	The driver's output to an external MOSFET

ELECTRICAL CHARACTERISTICS (For typical values TJ = 25°C, VDD = 10 V unless otherwise noted.)

Characteristic	Symbol	Pin	Min	Typ	Max	Unit
Supply Section						
Turn-on threshold level, VDD going up	VDD(off)	5	14.5	15.35	16	V
Minimum Operating voltage after turn-on	VDD(min)	5	8.5	9	9.5	V
VDD Decreasing Level at which the Latchoff Phase Ends	VDD(latch)	5	6	6.45	7	V
VDD Overvoltage Protection Level	VDD(ovp)	5	17.5	18.65	19.5	V
Startup Current	Istart	5	40	55	70	uA
Normal Operating Current with output switching at output load = 1nF	ICC	5	1.5	1.7	1.9	mA
Internal IC Consumption, Latch-off Phase, VDD = 7.0V	IDD	5	0.7	0.9	1.1	mA
Internal Oscillator						
Oscillator Switching Frequency, RI=100kohm	Fosc	6	52	58	64	kHz
Oscillator Switching Frequency, RI=Unconnected	Fosc_int	6	62	66	70	kHz
Maximum Duty Cycle ^{*(Note 1)}	Dmax	6	76	80	84	%
Frequency Jittering Amplitude in Percentage of Oscillator Frequency ^{*(Note2)}	Amp_jitter	6	±4	±5	±8	%
Frequency Jittering	F_jitter	6		125		Hz
Current Sense Section						
Primary Peak Current Limit Voltage	Vcs	4	0.78	0.83	0.88	V
Minimum On Time in a duty cycle	Ton-min	6		300		ns
Drive Output						
Output Voltage Rise-Time at CL=1nF, 10% to 90% of output signal	Tr	6		70		ns
Output Voltage Fall-Time at CL=1nF, 10% to 90% of output signal	Tf	6		30		ns

Note 1: External Ramp Compensation is needed when the converter running into continuous current mode and the duty cycle > 50%.



Measurement Result

Vin(V)	Vout(V)	Iload(mA)	Pin(W)	Efficiency(%)
115	4.997	0	0.07	
115	4.952	225	1.52	73.3
115	4.964	450	2.95	75.7
115	4.974	675	4.42	76.0
115	4.985	900	5.93	75.7

Average Efficiency (%) = 75.2%

Vin(V)	Vout(V)	Iload(mA)	Pin(W)	Efficiency(%)
230	4.997	0	0.18	
230	4.951	225	1.79	62.2
230	4.963	450	3.2	69.8
230	4.975	675	4.64	72.4
230	4.986	900	6.16	72.8

Average Efficiency (%) = 69.3%

