

High performance Off-line PWM switching power controller——AP8012H

DESCRIPTION

AP8012H is a high-performance off-line PWM switching power supply controller, which meets the requirement of green environmental protection. The circuit has built-in high-voltage start loop, soft start loop and multiple protection functions, with simplified application periphery and high reliability. Under certain operating conditions, the circuit can also be used as a non-isolated application scheme.

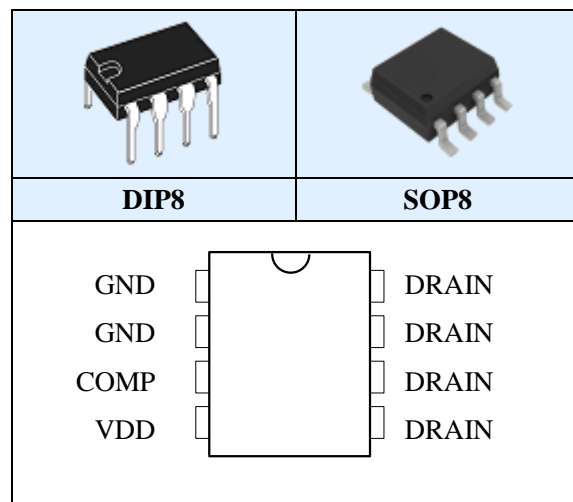
Available in DIP-8/SOP-8 Package. AP8012H can be widely used in all kinds of economical switching power supply.

FEATURES

- Build-in 750V power MOSFET
- Built-in high voltage start-up circuit
- AC input voltage range:85V ~ 265V
- Latch pulse width modulation, pulse current limiting detection
- Soft start
- Built-in over-load protection(OLP),over temperature protection(OTP),VDD over-voltage protection(OVP), output open/short circuit protection function

- With functions of frequency modulation and vibrating frequency for low EMI
- No-load power consumption is less than 0.15W

PIN CONFIGURATION





TYPICAL APPLICATION

- Small household application power supplies
- Electromagnetic oven power supplies
- Used throughout the voltage range of 6W

PIN DESCRIPTION

PIN	SYMBOL	DESCRIPTION	PIN	SYMBOL	DESCRIPTION
1.	GND	Ground	5.	DRAIN	Internal MOSFET drain
2.			6.		
3.	COMP	Output Feedback	7.		
4.	VDD	Power Supply	8.		

ORDERING INFORMATION

DEVICE	PACKAGE	MARKING	PACKING	
AP8012H	DIP8	 AP8012H XXXxX	Tube	10K/Small Box
AP8012H	SOP8	 AP8012H XXXxX	T&R	4K/reel

BLOCK DIAGRAM

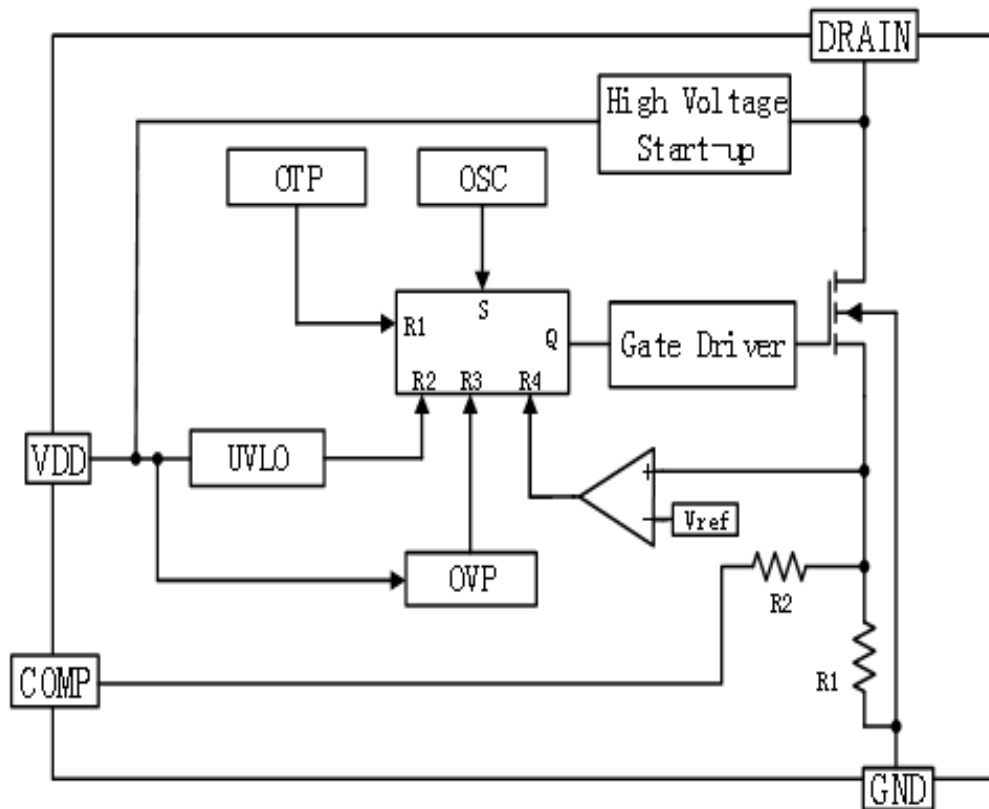


Figure.1 Functional block diagram of AP8012H

ABSOLUTE MAXIMUM RATINGS (TA=25°C)

PARAMETER	SYMBOL	VALUE		UNIT
VDD Pin Voltage	V _{DD}	-0.3~45.0		V
COMP terminal voltage	V _{COMP}	-0.3~6.0		V
DRAIN terminal voltage	V _{DRAIN}	-0.3~750		V
PN junction to ambient thermal resistance	θ _{JA}	SOP	85	°C/W
		DIP	55	
Operating Temperature	T _J	0 ~150		°C
Storage Temperature	T _{STG}	-55~150		°C
ESD(Human Body Model)	—	2		KV

Note: Instant maximum ratings specified will not cause permanent damage to the product, while long maximum ratings specified applied will do and may affect product reliability.

ELECTRICAL CHARACTERISTICS (TA=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
VDD Voltage Section						
Working power range	V _{DD}	—	10	—	35	V
Start-up Voltage	V _{DD_ON}	—	13	15	17	V
Shut Down	V _{DD_OFF}	—	7	8	9	V
VDD Restart Voltage	V _{DD_RST}	—	—	6.0	—	V
VDD Over-voltage Protection Voltage	V _{DD_OVP}	—	36	40	44	V
VDD Start-up Charging Current	I _{HV}	V _{AC} =85V~265V	—	1.25	—	mA
Start-up Current	I _{START}	V _{DD} = V _{DD_ON} -1V	—	300	—	μA
Operating Current	I _{CC}	V _{DD} = V _{DD_ON} +1V V _{COMP} =0.5V	—	3.5	6	mA
OSCILLATOR Section						
Initial Accuracy	OSC	—	38	43	48	kHz
Frequency Variation	F _D	—	—	±5	—	kHz
Current detection Section						
Output Limiting Current	I _S	—	500	600	700	mA
COMP Sense Section						
COMP Shut Down	V _{COMP_SP}	—	1.1	1.2	1.3	V

COMP Pin Input Impedance	R_{COMP}	—	—	1.0	—	k Ω
Pulse width modulation Section						
Maximum Duty Cycle	D_{MAX}	—	—	—	90	%
Minimum Duty Cycle	D_{MIN}	—	5	—	—	%
Minimum Turn On Time	T_{LEB}	—	—	400	—	nS
Minimum Turn On Time	T_{onmin}	—	—	800	—	nS
Temperature protection Sense Section						
Thermal protection temperature	T_{SD}	—	—	150	—	$^{\circ}C$
Thermal protection hysteresis temperature	T_{SD_DLY}	—	—	30	—	$^{\circ}C$
Power MOSFET Section						
MOSFET Drain Source Voltage Withstand	V_{BVDSS}	$V_{GS}=0V,$ $I_D=0.25mA$	750	—	—	V
MOSFET On Resistance	R_{dson}	$I_D=1A$	—	17	—	Ω

APPLICATION CIRCUIT

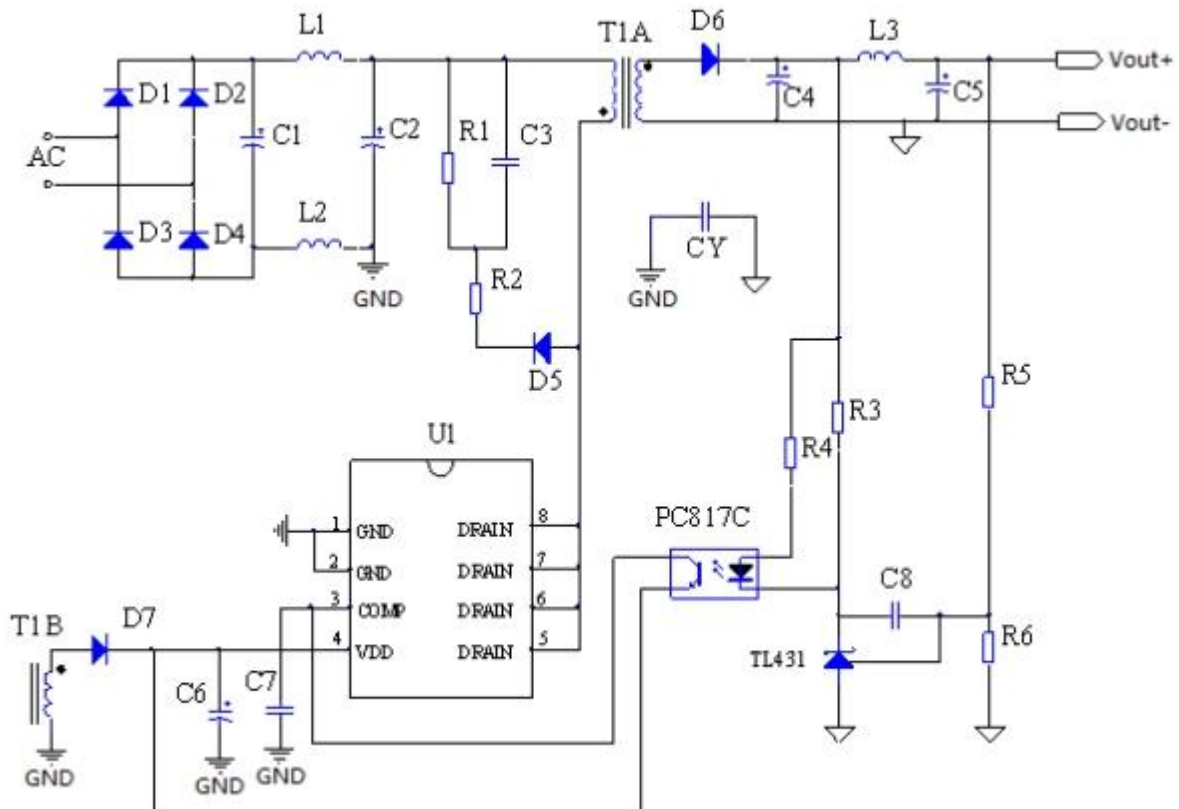
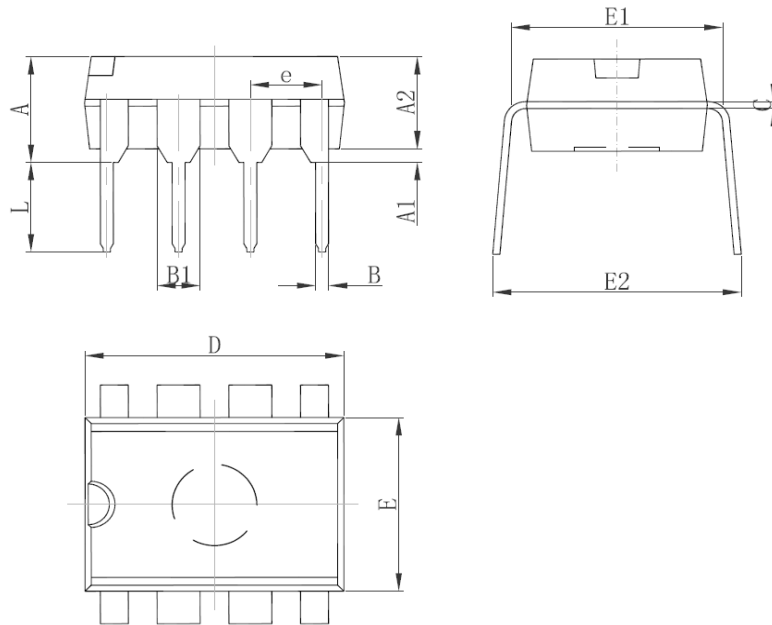


Figure.2 typical application diagram

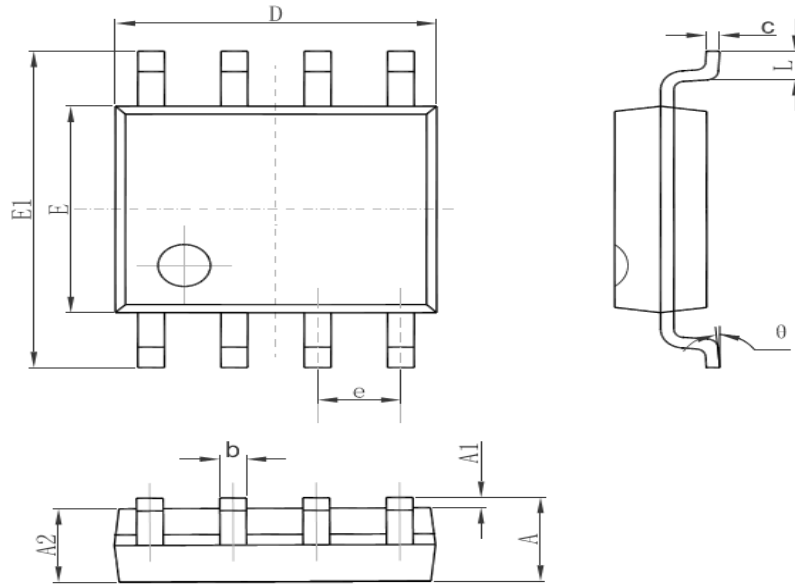
OUTLINE DRAWING

DIP8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524(BSC)		0.060(BSC)	
C	0.204	0.360	0.008	0.014
D	9.000	9.400	0.354	0.370
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540(BSC)		0.100(BSC)	
L	3.000	3.600	0.118	0.142
E2	7.620	9.000	0.300	0.354

SOP8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.700	4.100	0.150	0.157
E1	5.800	6.200	0.228	0.224
e	1.270(BSC)	0.050(BSC)		
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°