

Transition Mode PFC controller

ADT6011

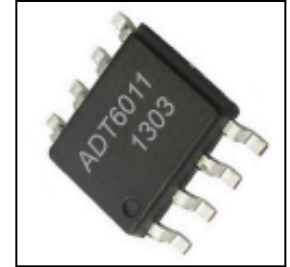
DESCRIPTION

The ADT6011 is a transition mode PFC controller IC and it is very high power factor controller for Pre regulator and LED Lighting applications.

It can operate with wide input voltage range from 90V to 270VAC.

It supports flyback topology and achieves very high power factor.

The internal linear multiplier is able to reduce AC input current distortion, and operates with very low THD.



SOP-8

The output voltage is controlled by feedback with 1% precise internal voltage reference. It provides very accuracy overvoltage protection .

FEATURES

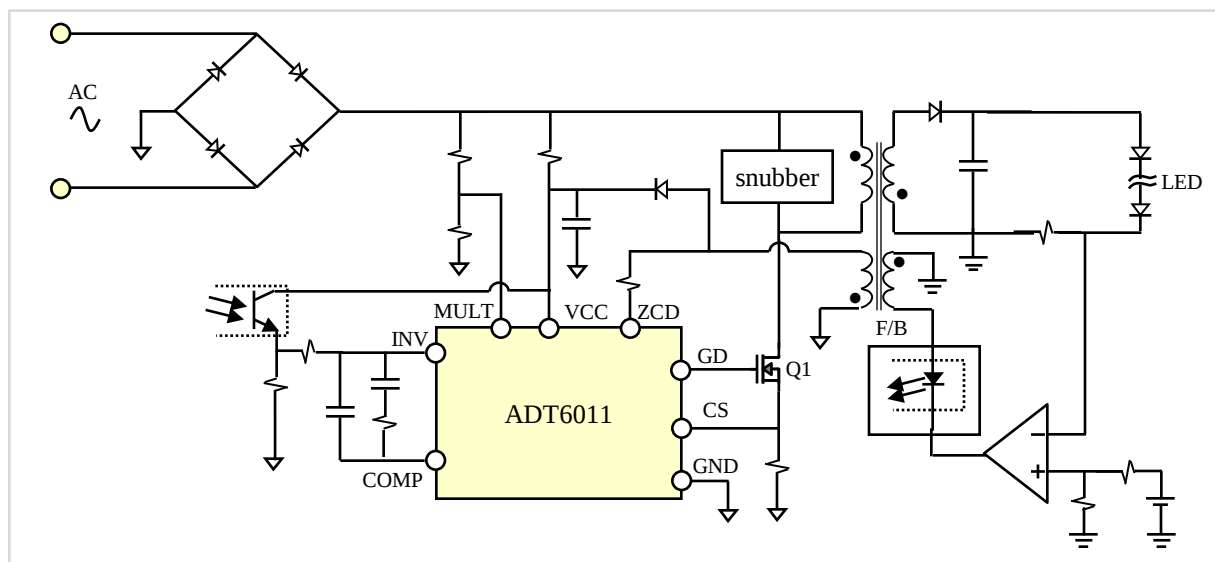
- Transition Mode operation
- Low startup current (10uA)
- Trimmed 1% Internal reference voltage
- Internal startup timer
- Internal Leading edge blanking
- Cycle-by-Cycle current limit
- Under Voltage Lockout
- Very accurate output overvoltage protection
- Totem pole gate driver with voltage clamp
- High Power factor (>0.95) and Low THD (< 20%)
 - * Base TM PFC mode

APPLICATIONS

- PFC pre-regulator
- LED lighting
 - . Single stage high PF Flyback AC/DC SMPS
 - . Single stage offline LED driver
 - . LED lighting power

** This specifications are subject to be changed without notice*

TYPICAL APPLICATION



ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

PARAMETER	SYMBOL	RATING	UNIT
Ground Voltage	GND	-0.3	V
Power Voltage	VCC	40	V
Gate Driver Output	OUT	18	V
All other pins	INV,COMP,MULTI,ZCD	6	V
Power Dissipation	P _D	0.64	W
Junction Temperature	T _j	-40 ~ 150	°C
Storage Temperature	T _{stg}	-65 ~ 150	°C
Thermal Resistance	θ _{JA}	150	°C/W

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ELECTRICAL CHARACTERISTICS

(VCC = 20V, Ta=25°C, Co = 1nF; unless otherwise specified)

Items	Symbol	Parameter	Condition	Unit	Spec		
					ADT6011		
					Min	Typ	Max
supply current	Istartup	start up	Before turn on, VCC=11V	uA	-	10	40
	Iq	quiescent	After turn on, no switching	mA	-	1.2	4.5
	Icc	Switching	@ 70khz	mA	-	3.5	6
supply voltage	VCC	Operating voltage		V	11	-	37
	UVLO(IC ON)	Start up threshold		V	-	16	-
	UVLO(IC OFF)	UVLO		V	9	10	11
	Hys	UVLO hysteresis		V	5	6	7
	OVP	Over voltage protection		V	37	38.5	40
Error Amp	Vref	EA reference	Ta=25°C	V	2.475	2.5	2.525
	Gv(*)	Voltage gain	Open loop	dB	-	80	-
	Gb(*)	Gain bandwidth		Mhz	-	1	-
	Icomp	Source current	V(COMP)=3.6V, V(INV)=2.4V	mA	-3	-10	-17
		Sink current	V(COMP)=3.6V, V(INV)=2.6V	mA	3	10	17
	Vcomp	Upper clamp voltage	Isource=0.5mA	V	5.3	5.8	6.3
		Low clamp voltage	Isink=0.5mA	V	1.3	1.6	1.9
Static OVP	SOVP	Static OVP threshold voltage		V	2.1	2.25	2.4
Multiplier	Vmulti	Linear operating range		V	0~3	-	-
	$\Delta V_{cs}/\Delta v_{multi}$	Output max. slope	V(MULT)=0 to 0.5V, V(COMP)=Upper clamp	V/V	1.0	1.1	-
	K	Gain	V(MULT)=1 to 2V, V(COMP)=3.5V	1/V	0.27	0.35	0.49
CS Comp	Vcs	CS reference clamp	V(COMP)=4V, V(MULT)=4V	V	0.92	1	1.08
	Tleb	LEB		ns	-	200	-
Zero Current Detector	Vzcd_upper	Upper clamp voltage	I(ZCD)=2.5mA	V	5.1	5.8	6.6
	Vzcd_lower	Lower clamp voltage	I(ZCD)=-2.5mA	V	-	0	-
	Vzcda(*)	Arming voltage(posedge)		V	-	1.4	-
	Vzcdt(*)	Triggering voltage(negedge)		V	-	0.7	-
Startup Timer	Tstart	Re-start timer period		us	60	120	200
Gate Drive	Vol	Low output voltage	Io=100mA	V	-	0.6	1.2
	Voh	High output voltage	Io=-50mA	V	12	14	-
	Tr	Rising time	Cl=1nF	ns	-	60	110
	Tf	Falling time	Cl=1nF	ns	-	30	70

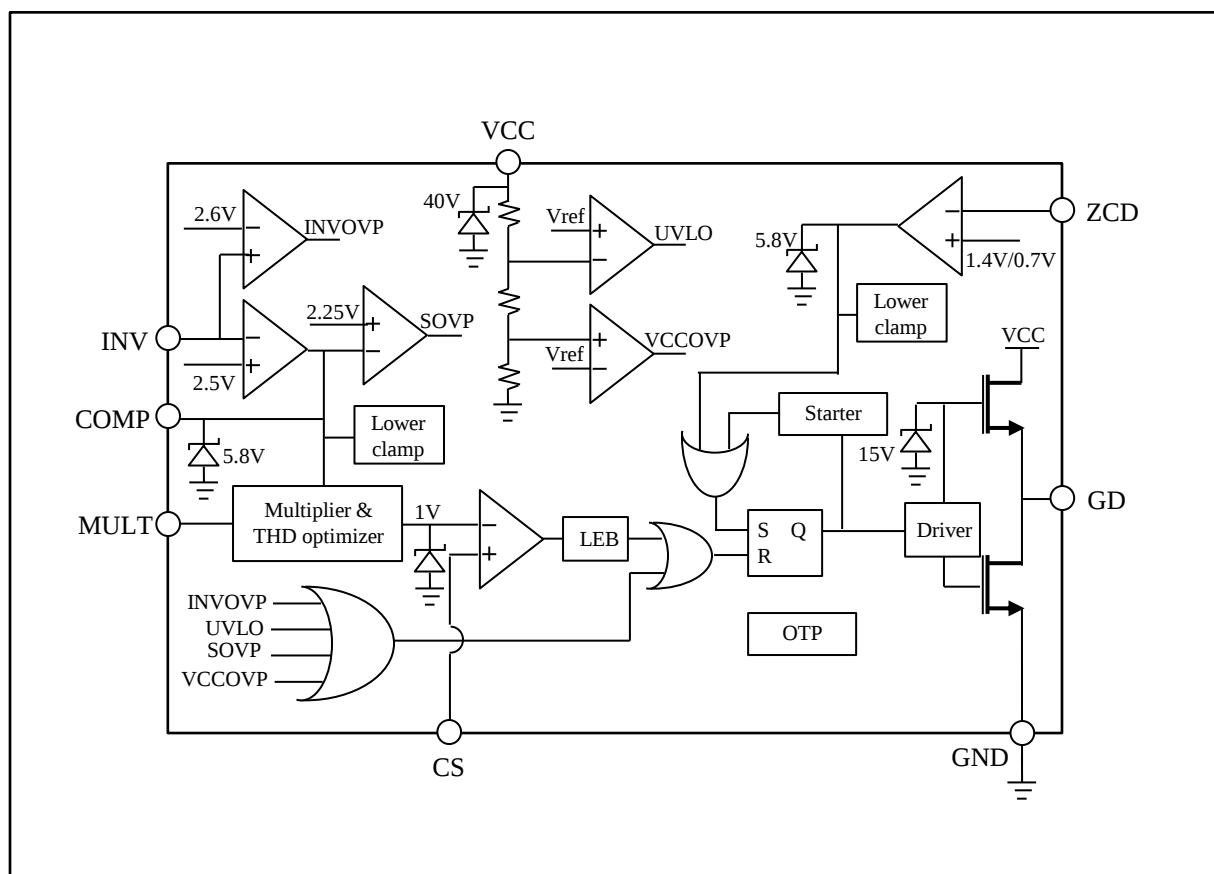
Note 1 : The parameter is guaranteed by design. It is not tested in production.

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PIN DESCRIPTION

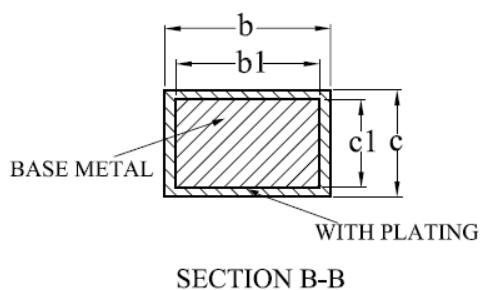
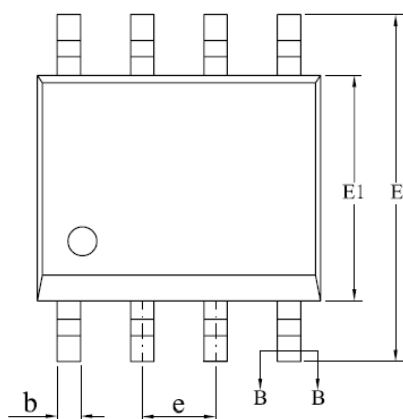
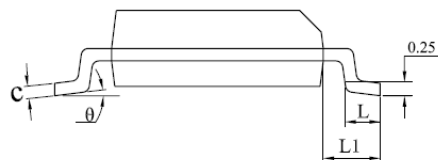
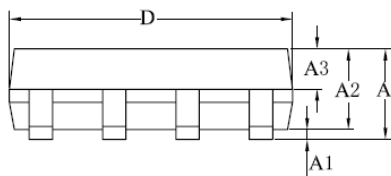
Pin No.	Pin Name	Description
1	INV	Inverting input of the error amplifier.
2	COMP	Output of Error amplifier. The compensation network is placed between INV and COMP pin.
3	MULT	Main input of the multiplier. Connected to the rectified main voltage via a resistor divider and provides the sinusoidal reference to the current loop.
4	CS	Current sense input and one input of internal PWM comparator.
5	ZCD	Zero Current Detection input. A negative edge triggers MOSFET' turn on.
6	GND	Ground.
7	GD	Gate driver output.
8	VCC	Supply voltage input.

BLOCK DIAGRAM



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PACKAGE DIMENSTION



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.77
A1	0.08	0.18	0.28
A2	1.20	1.40	1.60
A3	0.55	0.65	0.75
b	0.39	—	0.48
b1	0.38	0.41	0.43
c	0.21	—	0.26
c1	0.19	0.20	0.21
D	4.70	4.90	5.10
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27BSC		
L	0.50	0.65	0.80
L1	1.05BSC		
θ	0	—	8°

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