

# KA3842AC

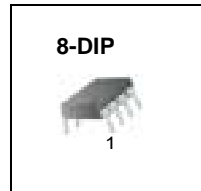
## SMPS Controller

### Features

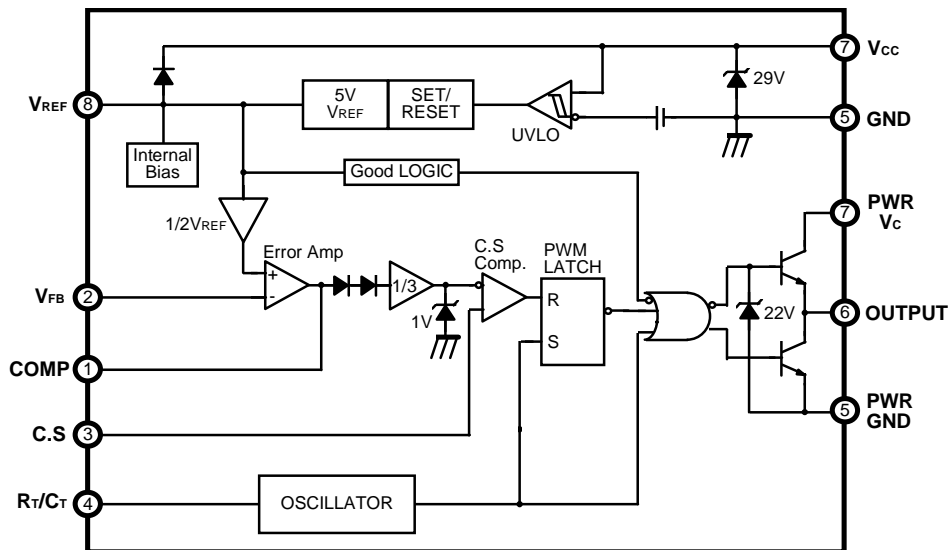
- Low Start Current 0.2mA (Typ)
- Operating Range up to 500kHz
- Cycle by Cycle Current Limiting
- Under Voltage Lock Out With Hysteresis
- Short Shutdown Delay Time: Typ.100ns
- High Current Totem-Pole Output
- Output Swing Limiting: 22V

### Description

The KA3842AC are fixed PWM controller for Off Line and DC to DC converter applications. The internal circuits include UVLO, low start up current circuit, temperature compensated reference, high gain error amplifier, current sensing comparator, and high current totem pole output for driving a POWER MOSFET. Also KA3842AC provides low start up current below 0.3mA and short shutdown delay time typ. 100ns. The KA3842AC has UVLO threshold of 16V(on) and 10V(off). The KA3842AC can operate within 100% duty cycle.



### Internal Block Diagram



## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	30	V
Output Current	I <sub>O</sub>	±1	A
Analog Inputs (Pin2, 3)	V <sub>I(ANA)</sub>	-0.3 to 6.3	V
Error Amp. Output Sink Current	I <sub>SINK(EA)</sub>	10	mA
Power Dissipation	P <sub>D</sub>	1	W
Thermal Resistance, Junction-to-Air (Note4)	R <sub>θja</sub>	95	°C/W

## Electrical Characteristics

(V<sub>CC</sub> = 15V, R<sub>T</sub> = 10kΩ, C<sub>T</sub> = 3.3nF, T<sub>A</sub> = 0°C to +70°C, Unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>REFERENCE SECTION</b>						
Output Voltage	V <sub>REF</sub>	T <sub>J</sub> = 25°C, I <sub>O</sub> = 1mA	4.9	5.0	5.1	V
Line Regulation	ΔV <sub>REF</sub>	V <sub>CC</sub> = 12V to 25V	-	6	20	mV
Load Regulation	ΔV <sub>REF</sub>	I <sub>O</sub> = 1mA to 20mA	-	6	25	mV
Output Short Circuit	I <sub>SC</sub>	T <sub>a</sub> = 25°C	-	-100	-180	mA
<b>OSILLATOR SECTION</b>						
Initial Accuracy	F <sub>OSC</sub>	T <sub>J</sub> = 25°C	47	52	57	kHz
Voltage Stability	ST <sub>V</sub>	V <sub>CC</sub> = 12V to 25V	-	0.2	1	%
Amplitude	V <sub>OSC</sub>	V <sub>PIN4</sub> , Peak to Peak	-	1.7	-	V
Discharge Current	I <sub>DISCHG</sub>	T <sub>J</sub> = 25°C, Pin4 = 2V	7.8	8.3	8.8	mA
<b>CURRENT SENSE SECTION</b>						
Gain	G <sub>V</sub>	(Note2, 3)	2.85	3	3.15	V/V
Maximum Input Signal	V <sub>I(MAX)</sub>	V <sub>PIN1</sub> = 5V(Note2)	0.9	1.0	1.1	V
PSRR	PSRR	V <sub>CC</sub> = 12V to 25V (Note1, 2)	-	70	-	dB
Input Bias Current	I <sub>BIAS</sub>	-	-	-2	-10	uA
Delay to Output	T <sub>D</sub>	V <sub>PIN3</sub> = 0 V to 2V (Note1)	-	100	200	ns

**Electrical Characteristics** (Continued)

(VCC = 15V, RT = 10kΩ, CT = 3.3nF, TA = 0°C to +70°C, Unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>ERROR AMPLIFIER SECTION</b>						
Input Voltage	VI	TPIN1 = 2.5V	2.42	2.50	2.58	V
Input Bias Current	IBIAS	-	-	-0.3	-2	uA
Open Loop Gain	GVO	VO = 2V to 4V (Note1)	65	90	-	dB
Unity Gain Bandwidth	GBW	TJ = 25°C (Note1)	0.7	1	-	MHz
PSRR	PSRR	VCC = 12V to 25V (Note1)	60	70	-	dB
Output Sink Current	ISINK	VPIN2 = 2.7V VPIN1 = 1.1V	2	6	-	mA
Output Source Current	ISOURCE	VPIN2 = 2.3V VPIN1 = 5.0V	-0.5	-0.8	-	mA
Output High Voltage	VOH	VPIN2 = 2.3V R1 = 15kΩ to GND	5	6	-	V
Output Low Voltage	VOL	VPIN2 = 2.7V R1 = 15kΩ to Pin8	-	0.8	1.1	V
<b>OUTPUT SECTION</b>						
Output Low Level	VOL	ISINK = 20mA	-	0.1	0.4	V
		ISINK = 200mA	-	1.5	2.2	V
Output High Level	VOH	ISOURCE = 20mA	13	13.5	-	V
		ISOURCE = 200mA	12	13.5	-	V
Rise Time	tR	TJ = 25°C, C1 = 1nF (Note1)	-	40	100	ns
Fall Time	tF	TJ = 25°C, C1 = 1nF (Note1)	-	40	100	ns
Output Voltage Swing Limit	VOLIM	VCC = 27V, C1 = 1nF	-	22	-	V
<b>UNDER VOLTAGE LOCKOUT SECTION</b>						
Start Threshold	VTH	KA3842AC	15	16	17	V
Min. Operating Voltage ( After turn on )	VTL	KA3842AC	9	10	11	V
<b>PWM SECTION</b>						
Maximum Duty Cycle	DMAX	KA3842AC	94	96	100	%
Minimum Duty Cycle	DMIN	-	-	-	0	%
<b>TOTAL STANDBY CURRENT</b>						
Start-Up Current	IST	-	-	0.2	0.4	mA
Operating Supply Current	ICC	VPIN2 = VPIN3 = 0V	-	11	17	mA
VCC Zener Voltage	VZ	ICC = 25mA	-	29	-	V

\* Adjust VCC above the start threshold before setting at 15V

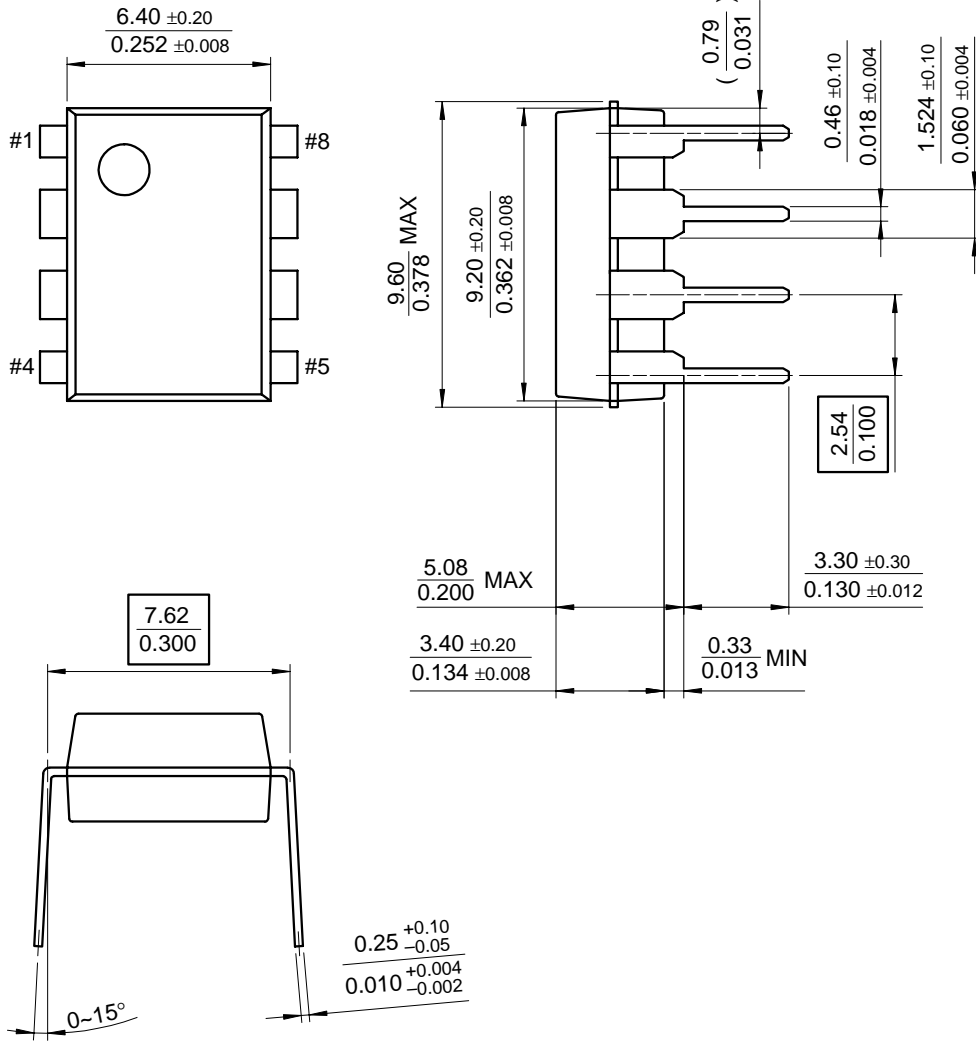
**Notes :**

- These parameters, although guaranteed, are not 100% tested in production.
  - Parameter measured at trip point of latch with V2 = 0V.
  - Gain defined as:  $G_V = \Delta V_{PIN1} / \Delta V_{PIN3}$  (VPIN3 = 0 to 0.8V)
  - Junction-to-air thermal resistance test environments.
- PCB information ;  
Board thickness : 1.6mm , Board dimension : 76.2 X 114.3mm<sup>2</sup> , Ref. : EIA / JSED51-3 and EIA / JSED51-7
- Board structure; Using the single layer PCB.

# Mechanical Dimensions

## Package

### 8-DIP



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## Ordering Information

Product Number	Package	Operating Temperature
KA3842AC	8-DIP	0 ~ +70°C

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