

KA3842AC

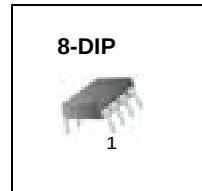
SMPS Controller

Features

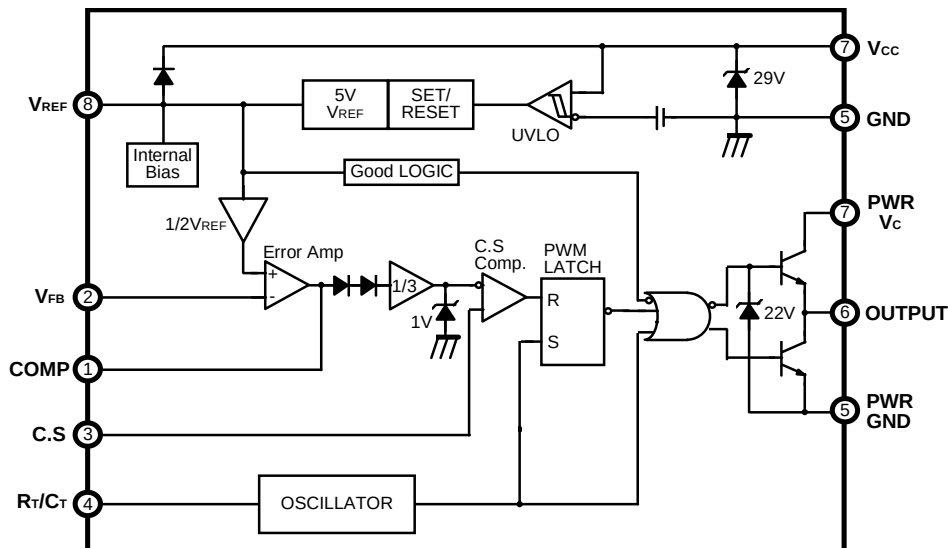
- Low Start Current 0.2mA (Typ)
- Operating Range up to 500kHz
- Cycle by Cycle Current Limiting
- Under Voltage Lock Out With Hysteresis
- Short Shutdown Delay Time: Typ.100ns
- High Current Totem-Pole Output
- Output Swing Limiting: 22V

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 _{CC}	30	V
Output Current	I _O	±1	A
Analog Inputs (Pin2, 3)	V _I (ANA)	-0.3 to 6.3	V
Error Amp. Output Sink Current	I _{SINK} (EA)	10	mA
Power Dissipation	P _D	1	W
Thermal Resistance, Junction-to-Air (Note4)	R _{θja}	95	°C/W

Electrical Characteristics

(V_{CC} = 15V, R_T = 10kΩ, C_T = 3.3nF, T_A = 0°C to +70°C ,Unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
REFERENCE SECTION						
Output Voltage	V _{REF}	T _J = 25°C, I _O = 1mA	4.9	5.0	5.1	V
Line Regulation	ΔV _{REF}	V _{CC} = 12V to 25V	-	6	20	mV
Load Regulation	ΔV _{REF}	I _O = 1mA to 20mA	-	6	25	mV
Output Short Circuit	I _{SC}	T _a = 25°C	-	-100	-180	mA
OSILLATOR SECTION						
Initial Accuracy	F _{OSC}	T _J = 25°C	47	52	57	kHz
Voltage Stability	ST _V	V _{CC} = 12V to 25V	-	0.2	1	%
Amplitude	V _{OSC}	V _{PIN4} , Peak to Peak	-	1.7	-	V
Discharge Current	I _{DISCHG}	T _J = 25°C, Pin4 = 2V	7.8	8.3	8.8	mA
CURRENT SENSE SECTION						
Gain	G _V	(Note2, 3)	2.85	3	3.15	V/V
Maximum Input Signal	V _I (MAX)	V _{PIN1} = 5V(Note2)	0.9	1.0	1.1	V
PSRR	PSRR	V _{CC} = 12V to 25V (Note1, 2)	-	70	-	dB
Input Bias Current	I _{BIAS}	-	-	-2	-10	uA
Delay to Output	T _D	V _{PIN3} = 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
ERROR AMPLIFIER SECTION						
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
OUTPUT SECTION						
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
UNDER VOLTAGE LOCKOUT SECTION						
Start Threshold	VTH	KA3842AC	15	16	17	V
Min. Operating Voltage (After turn on)	VTL	KA3842AC	9	10	11	V
PWM SECTION						
Maximum Duty Cycle	DMAX	KA3842AC	94	96	100	%
Minimum Duty Cycle	DMIN	-	-	-	0	%
TOTAL STANDBY CURRENT						
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

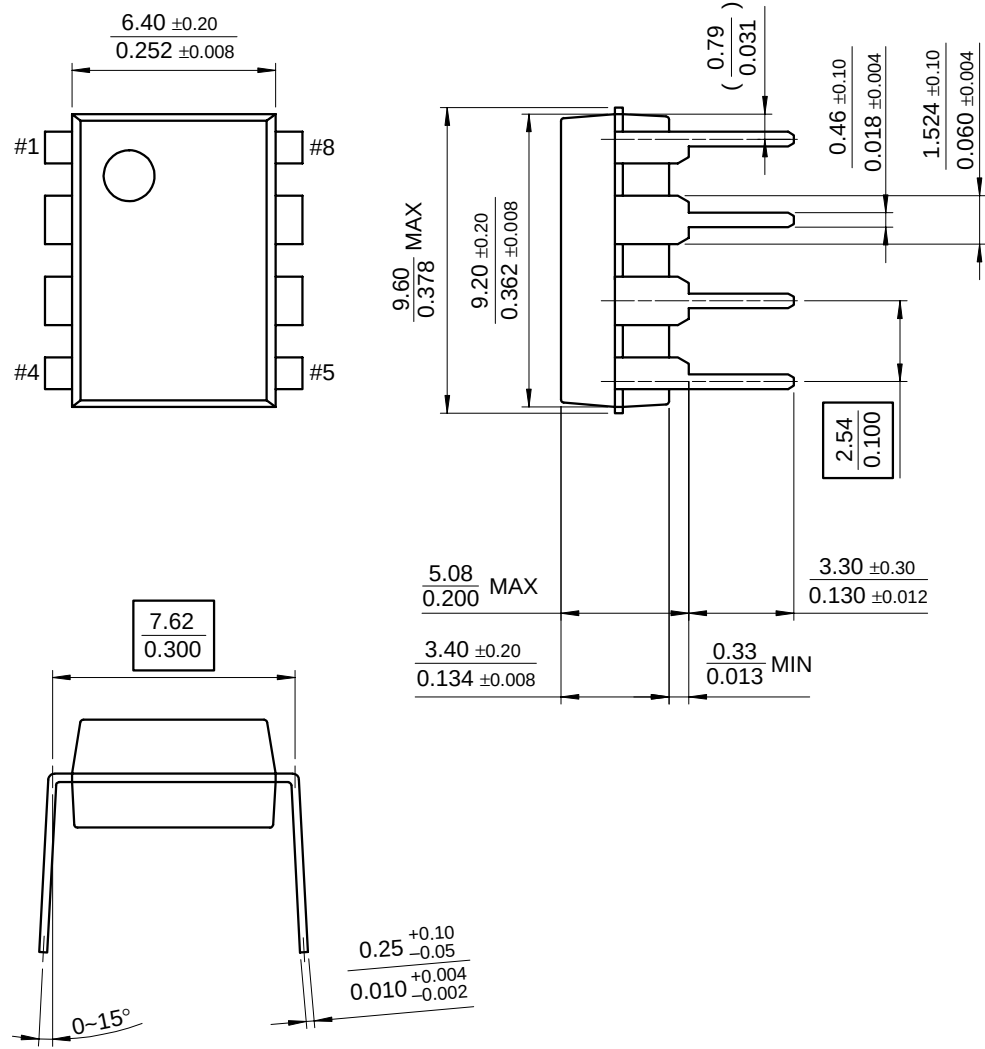
Notes :

- 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 114.3mm² , Ref. : EIA / JSED51-3 and EIA / JSED51-7
- Board structure; Using the single layer PCB.

Mechanical Dimensions

Package

8-DIP



Ordering Information

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

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.