# FAIRCHILD
SEMICONDUCTOR®

# KA3843AC
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 KA3843AC 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 KA3843AC provide low start up current below 0.3mA and short shutdown delay time typ. 100ns. The KA3843AC is 8.4V(on) and 7.6V(off). The KA3843AC can operate within 100% duty cycle.

8-DIP

1

8-SOP

1
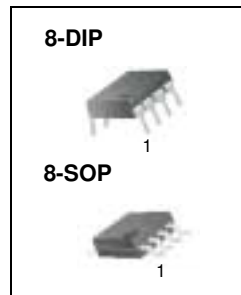
Internal Block Diagram
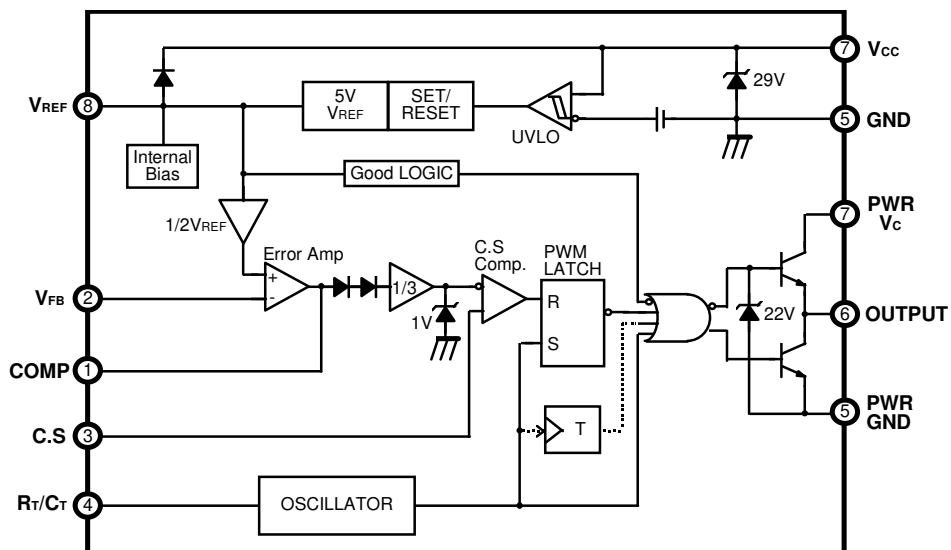
Absolute Maximum Ratings

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

Electrical Characteristics

(V_{CC} = 15V, R_T = 10KW, 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	R_{Line}	V_{CC} = 12V to 25V	-	6	20	mV
Load regulation	R_{LOAD}	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	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}	V_{SENSE}=0V	-	-2	-10	uA
Delay to output	T_D	V_{PIN3} = 0 V to 2V (Note1)	-	100	200	ns

Notes:

1. These parameters, although guaranteed, are not 100% tested in production.
2. Parameter measured at trip point of latch with V_{FB} = 0V.

3. Gain defined as: $G_V = \dfrac{\Delta V_{COMP}}{\Delta V_{SENSE}}; O \leq V_{SENSE} \leq 0.8V$

Electrical Characteristics (Continued)

(V$_{CC}$ = 15V, R$_T$ = 10KW, C$_T$ = 3.3nF, T$_A$ = 0°C to +70°C, Unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
ERROR AMPLIFIER SECTION						
Input voltage	V$_I$	V$_{PIN1}$ = 2.5V	2.42	2.50	2.58	V
Input bias current	I$_{BIAS}$	V$_{FB}$=0V	-	-0.3	- 2	uA
Open loop gain	G$_{VO}$	V$_O$ = 2V to 4V (Note1)	65	90	-	dB
Unity gain bandwidth	GBW	T$_J$= 25°C (Note1)	0.7	1	-	MHz
PSRR	PSRR	V$_{CC}$ = 12V to 25V (Note1)	60	70	-	dB
Output sink current	I$_{SINK}$	V$_{PIN2}$ = 2.7V, V$_{PIN1}$ = 1.1V	2	6	-	mA
Output source current	I$_{SOURCE}$	V$_{PIN2}$ = 2.3V, V$_{PIN1}$ = 5.0V	-0.5	-0.8	-	mA
Output high voltage	V$_{OH}$	V$_{PIN2}$ = 2.3V R1 = 15KΩ to GND	5	6	-	V
Output low voltage	V$_{OL}$	V$_{PIN2}$ = 2.7V R1 = 15kΩ to Vref	-	0.7	1.1	V
OUTPUT SECTION						
Output Low Level	V$_{OL}$	I$_{SINK}$ = 20mA	-	0.1	0.4	V
		I$_{SINK}$ = 200mA	-	1.5	2.2	V
Output high level	V$_{OH}$	I$_{SOURCE}$ = 20mA	13	13.5	-	V
		I$_{SOURCE}$ = 200mA	12	13.5	-	V
Rise time	t$_R$	T$_J$ = 25°C, C1 = 1nF (Note1)	-	40	100	ns
Fall time	t$_F$	T$_J$ = 25°C, C1 = 1nF (Note1)	-	40	100	ns
Output voltage swing limit	V$_{OLIM}$	V$_{CC}$ = 27V, C1 = 1nF	-	22	-	V
UNDER VOLTAGE LOCKOUT SECTION						
Start threshold	V$_{TH}$	KA3882E	15	16	17	V
		KA3883E	7.8	8.4	9.0	V
Min. operating voltage (after turn on)	V$_{TL}$	KA3882E	9	10	11	V
		KA3883E	7.0	7.6	8.2	V
PWM SECTION						
Maximum duty cycle	D$_{MAX}$	KA3882E/KA3883E	94	96	100	%
Minimum duty cycle	D$_{MIN}$	-	-	-	0	%
TOTAL STANDBY CURRENT						
Start-up current	I$_{ST}$	-	-	0.2	0.4	mA
Operating supply current	I$_{CC}$	V$_{PIN2}$ = V$_{PIN3}$ = 0V	-	11	17	mA
V$_{CC}$ zener voltage	V$_Z$	I$_{CC}$ = 25mA	-	29	-	V

* Adjust V$_{CC}$ above the start threshold before setting at 15V

Notes :

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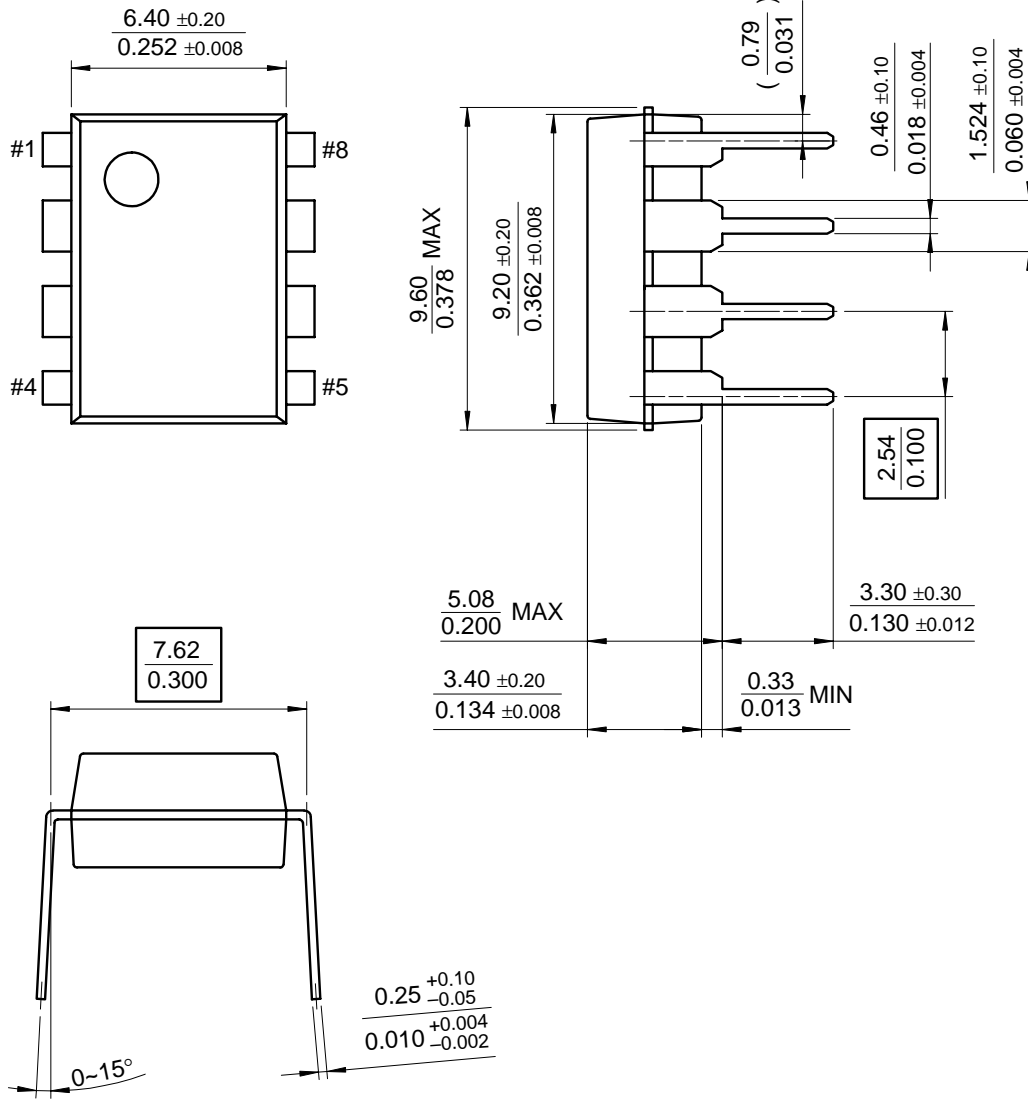2. Parameter measured at trip point of latch with V$_{FB}$ = 0V.

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Mechanical Dimensions
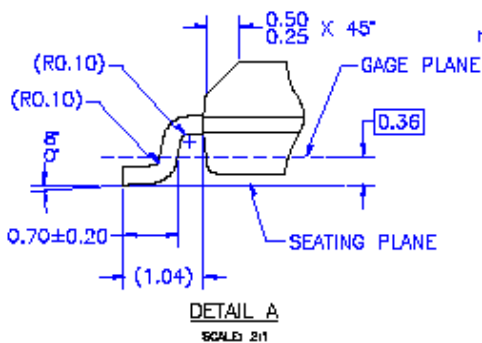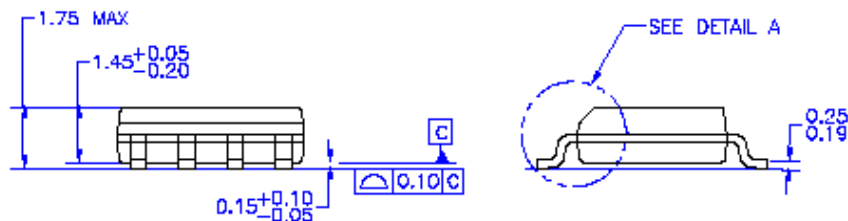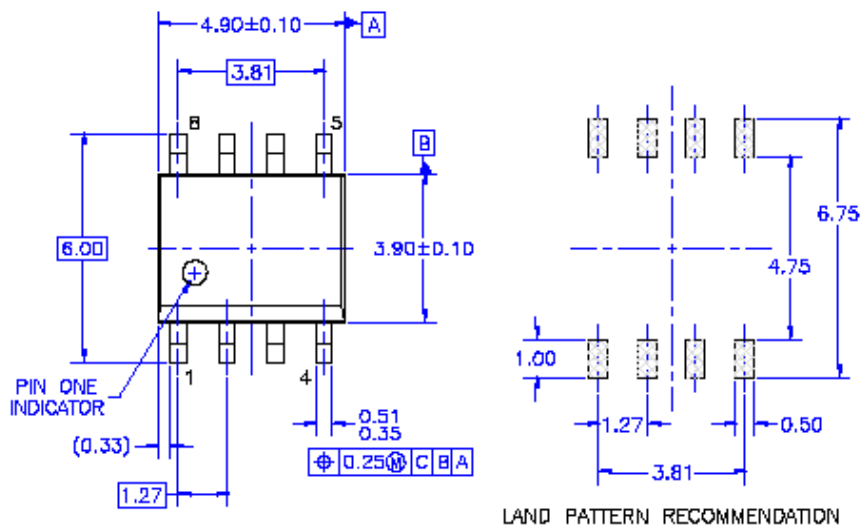
Package

Dimensions in millimeters

8-DIP

$\frac{6.40 \pm 0.20}{0.252 \pm 0.008}$

#1   #8

#4   #5

$\frac{9.60}{0.378}$ MAX

$\frac{9.20 \pm 0.20}{0.362 \pm 0.008}$

$\left(\frac{0.79}{0.031}\right)$

$\frac{0.46 \pm 0.10}{0.018 \pm 0.004}$

$\frac{1.524 \pm 0.10}{0.060 \pm 0.004}$

$\frac{2.54}{0.100}$

$\frac{5.08}{0.200}$ MAX

$\frac{3.30 \pm 0.30}{0.130 \pm 0.012}$

$\frac{7.62}{0.300}$

$\frac{3.40 \pm 0.20}{0.134 \pm 0.008}$

$\frac{0.33}{0.013}$ MIN

$\frac{0.25 \;^{+0.10}_{-0.05}}{0.010 \;^{+0.004}_{-0.002}}$

0~15°

Mechanical Dimensions (Continued)

Package

Dimensions in millimeters

8-SOP

LAND PATTERN RECOMMENDATION

DETAIL A
SCALE: 2/1

Ordering Information

Product Number	Package	Operating Temperature
KA3843AC	8-DIP	0 ~ +70°C
KA3843ACD	8-SOP	

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KA3843A
SMPS Controller

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General description

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- Short Shutdown Delay Time: Typ.100ns
- High Current Totem-Pole Output
- Output Swing Limiting: 22V

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Product status/pricing/packaging **BUY**

Product	Product status	Pb-free Status	Pricing*	Package type	Leads	Packing method

KA3843ACS	Full Production	Full Production	$0.445	DIP	8	RAIL

* Fairchild 1,000 piece Budgetary Pricing
** A sample button will appear if the part is available through Fairchild's on-line samples program. If there is no sample button, please contact a Fairchild distributor to obtain samples

Indicates product with Pb-free second-level interconnect. For more information click here.

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KA3843ACS

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