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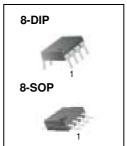
KA3882E/KA3883E SMPS Controller

Features

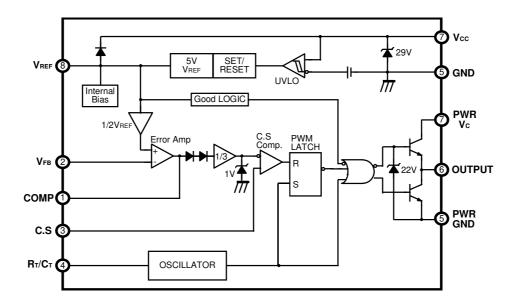
- Low start current 0.2mA (typ)
- Operating range up to 500kHz
- Cycle by cycle current limiting
- Under voltage lock out with hysteresis
- Short shutdown delay time: typ.100ns
- High current totem-pole output
- Output swing limiting: 22V

Description

The KA3882E/KA3883E is a fixed PWM controller for Off-Line and DC to DC converter applications. The internal circuits include a UVLO, a low start-up current circuit, a temperature compensated reference, a high gain error amplifier, a current sensing comparator, and the high current totem-pole output for driving a POWER MOSFET. Also the KA3882E/KA3883E provides low start-up current below 0.3mA and short shutdown delay time typ. 100ns. The KA3882E has UVLO threshold of 16V(on) and 10V(off). The KA3883E is 8.4V(on) and 7.6V(off). The KA3882E and KA3883E can operate within 100% duty cycle.



Internal Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply voltage	Vcc	30	V
Output current	lo	+1	A
Analog inputs (pin2, 3)	VI(ANA)	-0.3 to 6.3	V
Error amp. output sink current	ISINK(EA)	10	mA
Power dissipation	PD	1	W
Thermal resistance, junction-to-air (Note4) 8-SOP 8-DIP	Rθja	280 95	°C/W
Storage temperature	T _{stg}	-65 ~ 150	°C

Electrical Characteristics

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

Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit
REFERENCE SECTION						
Output voltage	VREF	T _J = 25°C, I _O = 1mA	4.9	5.0	5.1	V
Line regulation	RLine	V _{CC} = 12V to 25V	-	6	20	mV
Load regulation	RLOAD	I _O = 1mA to 20mA	-	6	25	mV
Output short circuit	Isc	T _a = 25°C	-	-100	-180	mΑ
OSILLATOR SECTION						
Initial accuracy	Fosc	T _J = 25°C	47	52	57	kHz
Voltage stability	STy	V _{CC} = 12V to 25V	-	0.2	1	%
Amplitude	Vosc	VPIN4, peak to peak	-	1.7	-	V
Discharge current	IDISCHG	T _J = 25°C	7.8	8.3	8.8	mA
CURRENT SENSE SECTION						
Gain	Gy	(Note2, 3)	2.85	3	3.15	V/V
Maximum input signal	VI(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	IBIAS	Vsense = 0V		-2	-10	uA
Delay to output	TD	VPIN3 = 0 V to 2V (Note1) -		100	200	ns

Electrical Characteristics (Continued)

(VCC = 15V, RT = $10k\Omega$, CT = 3.3nF, TA = $0^{\circ}C$ to $+70^{\circ}C$, Unless otherwise specified)

Parameter	Symbol	Conditions		Тур.	Max.	Unit
ERROR AMPLIFIER SECTION					•	
Input voltage	VI	VPIN1 = 2.5V	2.42	2.50	2.58	V
Input bias current	IBIAS	V _{FB} =0V	-	-0.3	- 2	uA
Open loop gain	Gvo	Vo = 2V to 4V (Note1)	65	90	-	dB
Unity gain bandwidth	GBW	T _J = 25°C (Note1)	0.7	1	-	MHz
PSRR	PSRR	Vcc = 12V to 25V (Note1)	60	70	-	dB
Output sink current	ISINK	V _{PIN2} = 2.7V, V _{PIN1} = 1.1V	2	6	-	mA
Output source current	ISOURCE	VPIN2 = 2.3V, VPIN1 = 5.0V	-0.5	-0.8	-	mA
Output high voltage	Voн	V_{PIN2} = 2.3 V , R1 = 15 $k\Omega$ to GND	5	6	-	V
Output low voltage	Vol	V_{PIN2} = 2.7V, R1 = 15kΩ to Vref	-	0.8	1.1	V
OUTPUT SECTION				•	•	•
Output low lovel	VoL	ISINK = 20mA	-	0.1	0.4	V
Output low level	VOL	ISINK = 200mA	-	1.5	2.2	V
Output high lovel	Voн	ISOURCE = 20mA	13	13.5	-	V
Output high level	VOH	ISOURCE = 200mA	12	13.5	-	V
Rise time	tR	T _J = 25°C, C1 = 1nF (Note1)	-	40	100	ns
Fall time	tF	T _J = 25°C, C1 = 1nF (Note1)	-	40	100	ns
Output voltage swing limit	Volim	V _{CC} = 27V, C1 = 1nF	-	22	-	V
UNDER VOLTAGE LOCKOUT SECTION						
Start threshold	VTH	KA3882E	15	16	17	V
	VIH	KA3883E	7.8	8.4	9.0	V
Min. operating voltage (after turn on)	VTL	KA3882E	9	10	11	V
	VIL	KA3883E	7.0	7.6	8.2	V
PWM SECTION			•	•	•	•
Maximum duty cycle	DMAX	KA3882E/KA3883E	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:

- 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:
$$G_V = \frac{\Delta V_{COMP}}{\Delta V_{SENSE}}$$
: $0 \le V_{SENSE} \le 0.8V$

- 4. Junction-to-air thermal resistance test enviroments.
- -. PCB information;

Board thickness: 1.6mm, Board dimension: 76.2 X 114.3mm 2 , Ref.: EIA / JSED51-3 and EIA / JSED51-7

-. Board structure; Using the single layer PCB.

Mechanical Dimensions

Package

Dimensions in millimeters

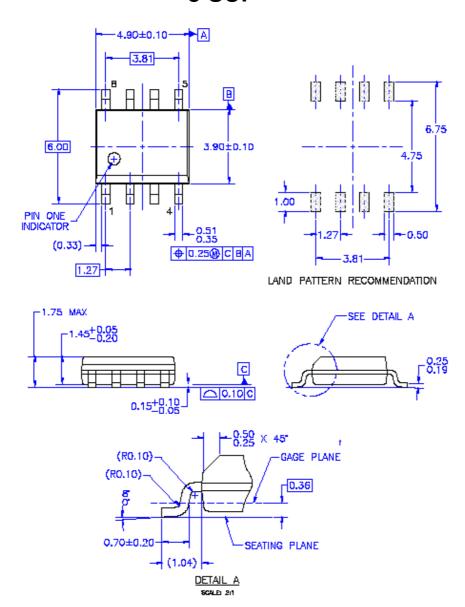
8-DIP 6.40 ±0.20 0.252 ±0.008 1.524 ± 0.10 0.46 ± 0.10 0.060 ± 0.004 0.018 ± 0.004 #8 9.20 ±0.20 0.362 ±0.008 2.54 3.30 ±0.30 $\frac{5.08}{0.200}$ MAX 0.130 ±0.012 7.62 0.300 $\frac{0.33}{0.013}\,\text{MIN}$ 3.40 ±0.20 0.134 ±0.008 $0.25^{\,+0.10}_{\,-0.05}$ 0.010 +0.004 -0.002 0~15°

Mechanical Dimensions (Continued)

Package

Dimensions in millimeters

8-SOP



Ordering Information

Product Number	Package	Operating Temperature
KA3882E	8-DIP	
KA3882ED	8-SOP	0 ~ +70°C
KA3883E	8-DIP	0 ~ +70 C
KA3883ED	8-SOP	

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