

KA3882E/KA3883E

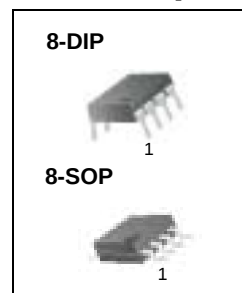
SMPS Controller

Features

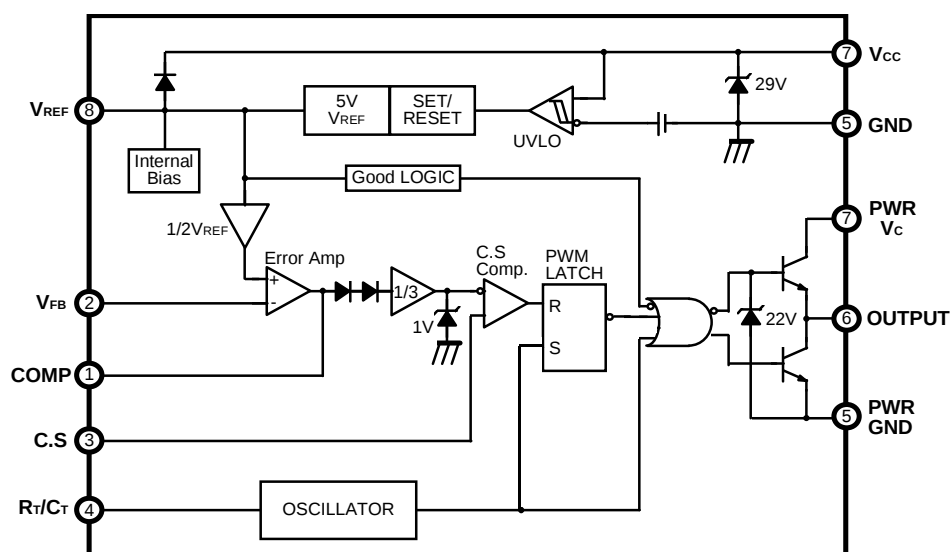
- Low start current 0.2mA (typ)
- Operating range up to 500kHz
- Cycle by cycle current limiting
- Under voltage lock out with hysteresis
- Short shutdown delay time: typ.100ns
- High current totem-pole output
- Output swing limiting: 22V

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	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) 8-SOP 8-DIP	R _{θja}	280 95	°C/W
Storage temperature	T _{stg}	-65 ~ 150	°C

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	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

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	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 V _{ref}	-	0.8	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 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 VFB = 0V.
- Gain defined as: $G_V = \frac{\Delta V_{COMP}}{\Delta V_{SENSE}}$; $0 \leq V_{SENSE} \leq 0.8V$
- 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.

Ordering Information

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

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