

ON Semiconductor

Is Now

onsemi™

To learn more about onsemi™, please visit our website at
www.onsemi.com

onsemi and **onsemi** and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi** product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner. Other names and brands may be claimed as the property of others.



KA3882C/KA3883C

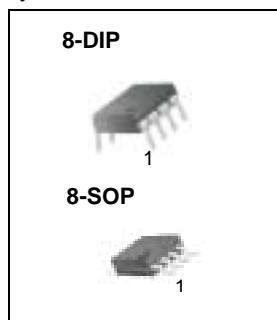
SMPS Controller

Features

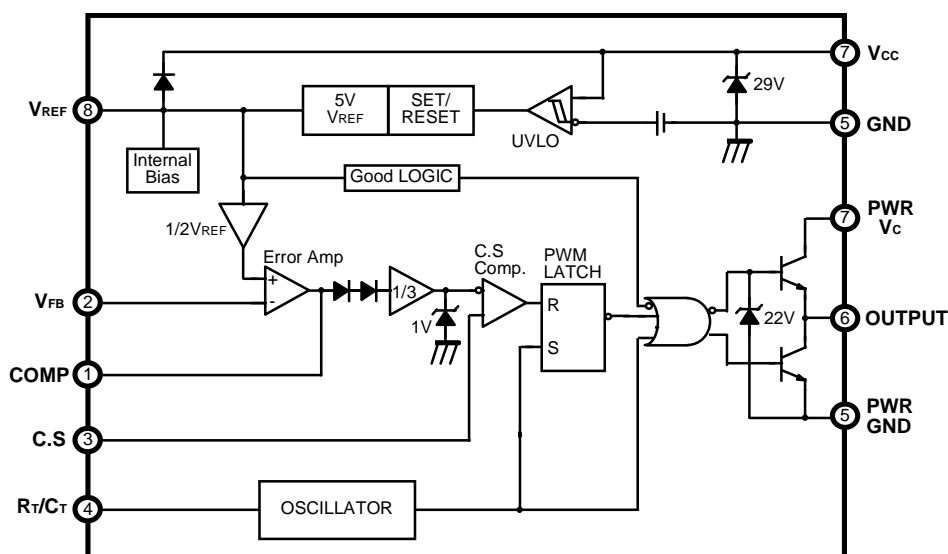
- Low Start Current 0.2mA (Typ)
- Operating Range Up To 500kHz
- Cycle by Cycle Current Limiting
- Under Voltage Lock Out With Hysteresis
- Short Shutdown Delay Time: Typ.100ns
- High Current Totem-Pole Output
- Output Swing Limiting: 22V

Description

The KA3882C/KA3883C is a fixed PWM controller for Off Line and DC to DC converter applications. The internal circuits include an 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 KA3882C/KA3883C provides low start-up current below 0.3mA and short shutdown delay time typ. 100ns. The KA3882C has the UVLO threshold of 16V (on) and 10V(off). The KA3883C is 8.4V(on) and 7.6V(off). The KA3882C and KA3883C 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 (pin 2, 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}	151 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	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	KA3882C	15	16	17	V
		KA3883C	7.8	8.4	9.0	V
Min. Operating Voltage (After turn on)	VTL	KA3882C	9	10	11	V
		KA3883C	7.0	7.6	8.2	V
PWM SECTION						
Maximum Duty Cycle	DMAX	KA3882C/KA3883C	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

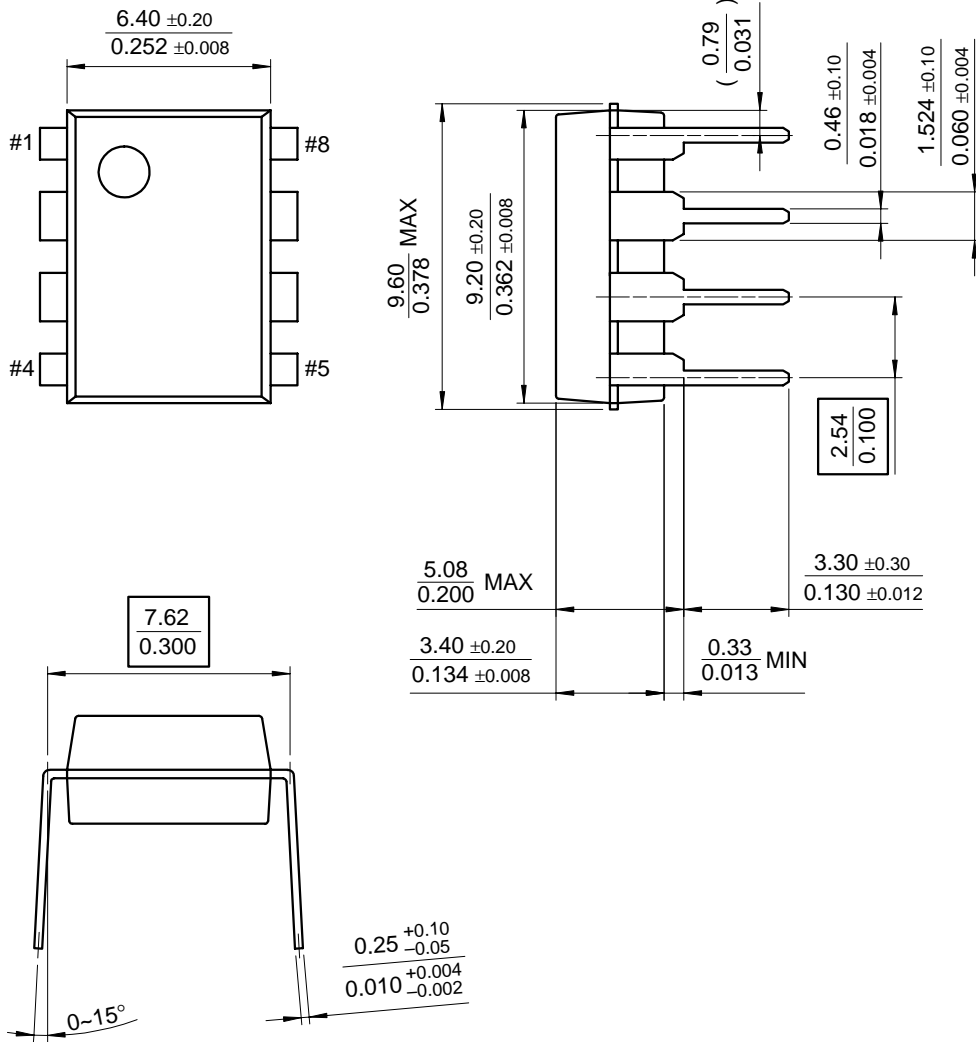
Notes :

- 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

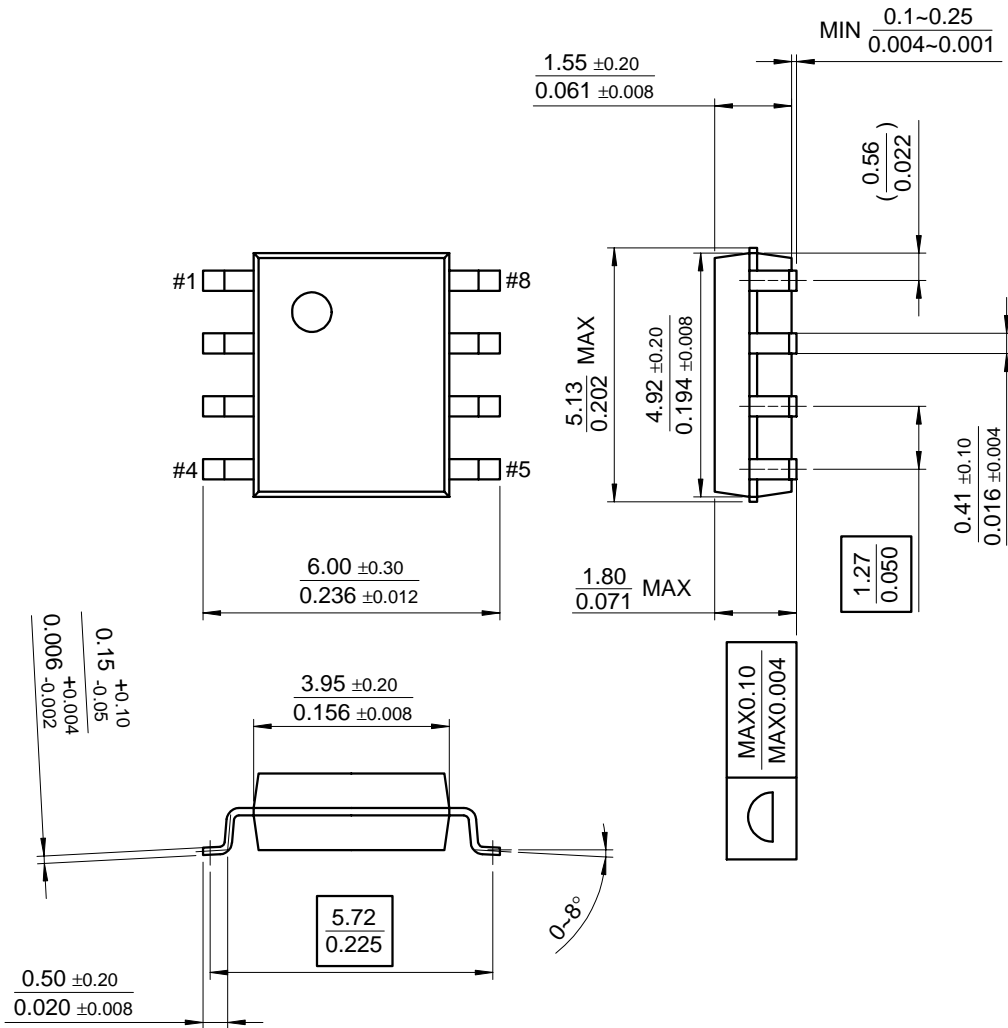
8-DIP



Mechanical Dimensions (Continued)

Package

8-SOP



Ordering Information

Product Number	Package	Operating Temperature
KA3882C	8-DIP	0 ~ +70°C
KA3882CD	8-SOP	
KA3883C	8-DIP	
KA3883CD	8-SOP	

DISCLAIMER

ON SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. ON SEMICONDUCTOR 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

ON SEMICONDUCTOR'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 ON 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.