

UC3842A/UC3843A

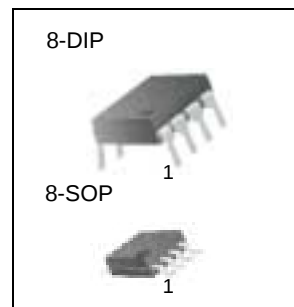
SMPS Controller

Features

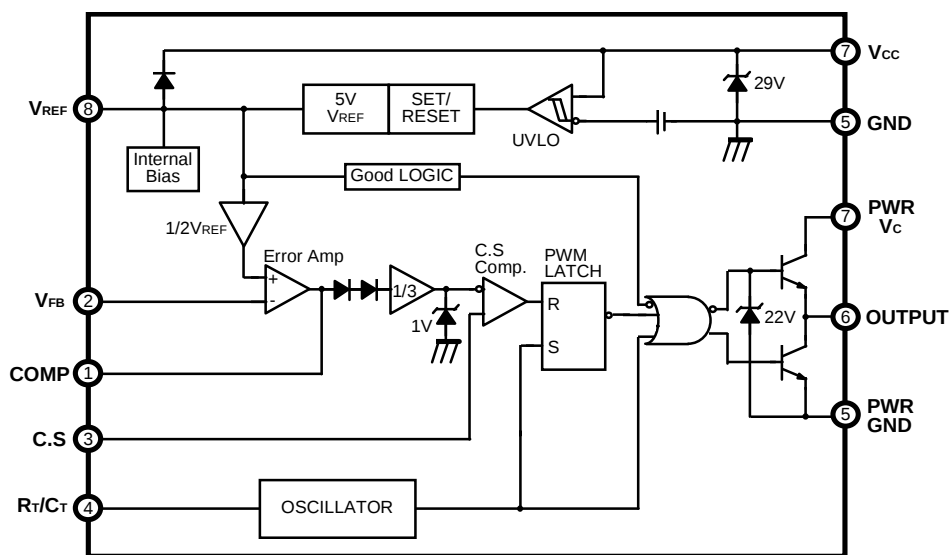
- Low Start Current 0.2mA (typ)
- Operating Range Up To 500KHz
- Cycle by Cycle Current Limiting
- Under Voltage Lock Out With Hysteresis
- Short Shutdown Delay Time: typ.100ns
- High Current Totem-pole Output
- Output Swing Limiting: 22V

Description

The UC3842A/UC3843A 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 UC3842A/UC3843A provide low start up current below 0.3mA and short shutdown delay time typ. 100ns. The UC3842A has UVLO threshold of 16V(on) and 10V(off). The UC3843A is 8.4V(on) and 7.6V(off). The UC3842A and UC3843A 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

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.	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	Δ V _{REF}	V _{CC} = 12V to 25V	-	6	20	mV
Load Regulation	Δ V _{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	(NOTE 2, 3)	2.85	3	3.15	V/V
Maximum Input Signal	V _{I(MAX)}	V _{PIN1} = 5V(NOTE 2)	0.9	1.0	1.1	V
PSRR	PSRR	V _{CC} = 12V to 25V (NOTE 1, 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)

(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.	Typ.	Max.	Unit
ERROR AMPLIFIER SECTION						
Input Voltage	V _I	T _{PIN1} = 2.5V	2.42	2.50	2.58	V
Input Bias Current	I _{BIAS}	-	-	-0.3	- 2	uA
Open Loop Gain	G _{VO}	V _O = 2V to 4V (NOTE 1)	65	90	-	dB
Unity Gain Bandwidth	GBW	T _J = 25°C (NOTE 1)	0.7	1	-	MHz
PSRR	PSRR	V _{CC} = 12V to 25V (NOTE 1)	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 Pin8	-	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 (NOTE 1)	-	40	100	ns
Fall Time	t _F	T _J = 25°C, C1 = 1nF (NOTE 1)	-	40	100	ns
Output Voltage Swing Limit	V _{OLIM}	V _{CC} = 27V, C1 = 1nF	-	22	-	V
UNDER VOLTAGE LOCKOUT SECTION						
Start Threshold	V _{TH}	UC3842A	15	16	17	V
		UC3843A	7.8	8.4	9.0	V
Min. Operating Voltage (After turn on)	V _{TL}	UC3842A	9	10	11	V
		UC3843A	7.0	7.6	8.2	V
PWM SECTION						
Maximum Duty Cycle	D _{MAX}	UC3842A/UC3843A	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

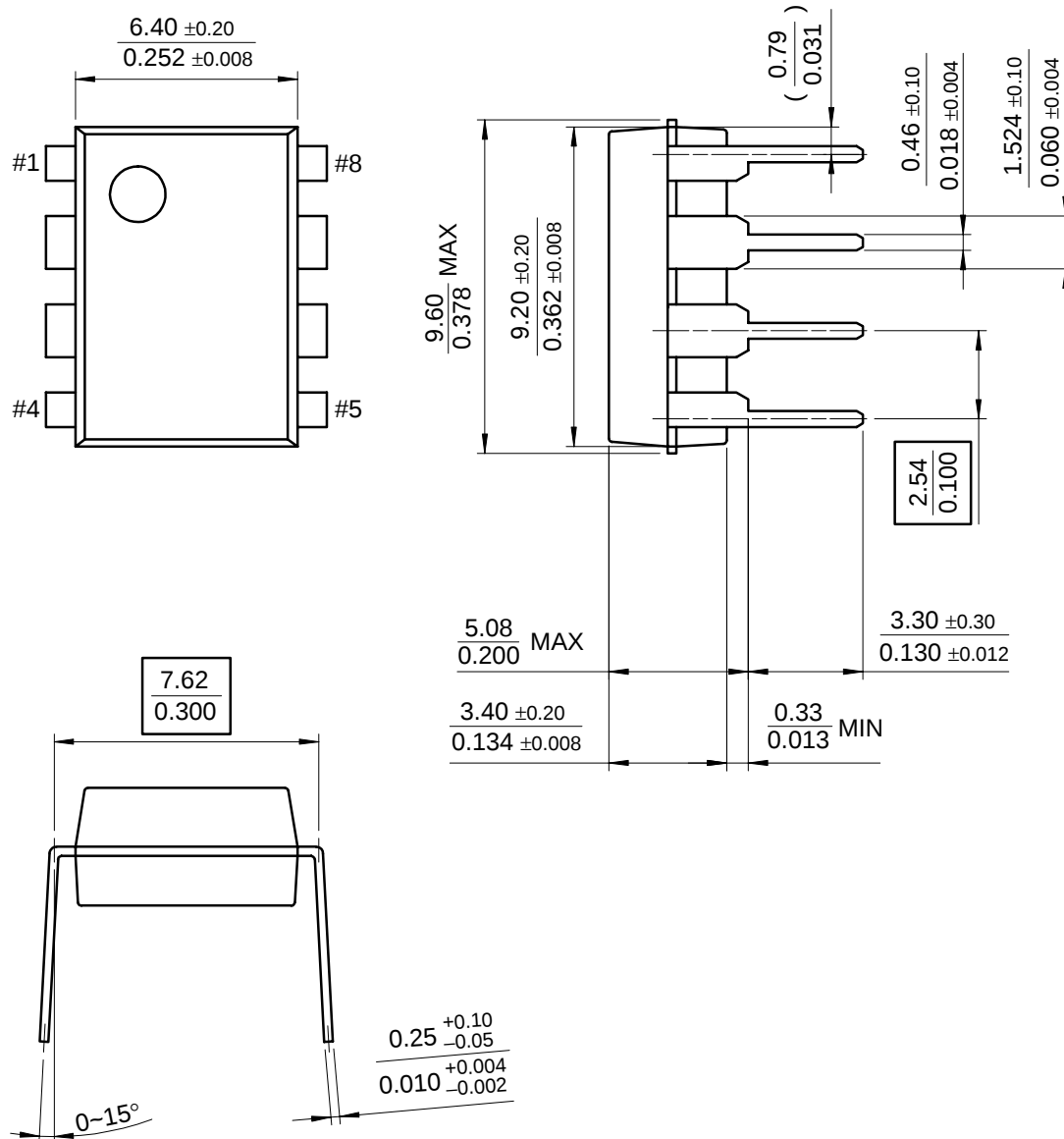
Notes :

1. These parameters, although guaranteed, are not 100% tested in production.
2. Parameter measured at trip point of latch with V₂ = 0V.
3. Gain defined as: G_V = $\Delta V_{PIN1} / \Delta V_{PIN3}$ (V_{PIN3} = 0 to 0.8V)

Mechanical Dimensions

Package

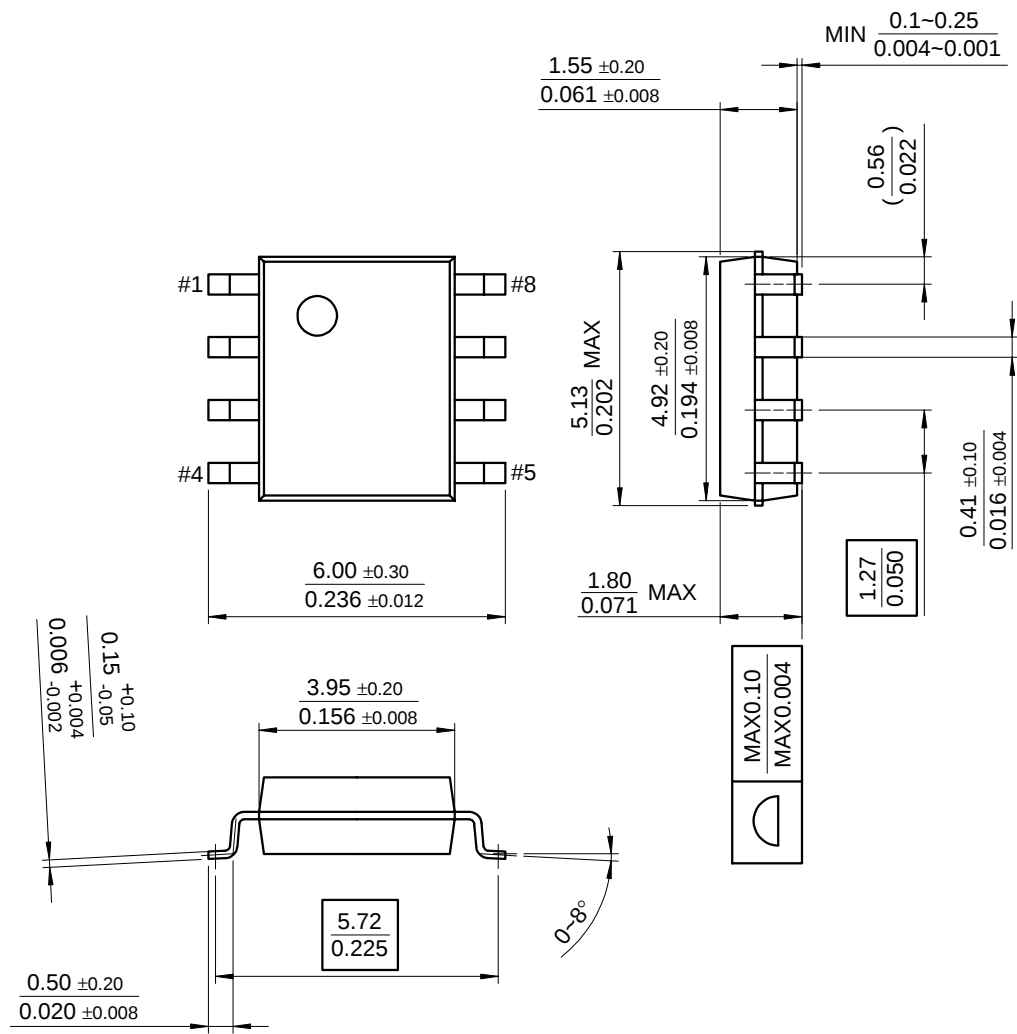
8-DIP



Mechanical Dimensions (Continued)

Package

8-SOP



Ordering Information

Product Number	Package	Operating Temperature
UC3842AN	8 DIP	0 ~ + 70°C
UC3842AD	8 SOP	
UC3843AN	8 DIP	
UC3843AD	8 SOP	

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 INTERNATIONAL. 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.