

阅读申明

- 1.本站收集的数据手册和产品资料都来自互联网，版权归原作者所有。如读者和版权方有任何异议请及时告之，我们将妥善解决。
- 2.本站提供的中文数据手册是英文数据手册的中文翻译，其目的是协助用户阅读，该译文无法自动跟随原稿更新，同时也可能存在翻译上的不当。建议读者以英文原稿为参考以便获得更精准的信息。
- 3.本站提供的产品资料，来自厂商的技术支持或者使用者的心得体会等，其内容可能存在描述上的差异，建议读者做出适当判断。
- 4.如需与我们联系，请发邮件到marketing@iczoom.com，主题请标有“数据手册”字样。

Read Statement

1. The datasheets and other product information on the site are all from network reference or other public materials, and the copyright belongs to the original author and original published source. If readers and copyright owners have any objections, please contact us and we will deal with it in a timely manner.
2. The Chinese datasheets provided on the website is a Chinese translation of the English datasheets. Its purpose is for reader's learning exchange only and do not involve commercial purposes. The translation cannot be automatically updated with the original manuscript, and there may also be improper translations. Readers are advised to use the English manuscript as a reference for more accurate information.
3. All product information provided on the website refer to solutions from manufacturers' technical support or users the contents may have differences in description, and readers are advised to take the original article as the standard.
4. If you have any questions, please contact us at marketing@iczoom.com and mark the subject with "Datasheets" .

UC3842/UC3843/UC3844/UC3845

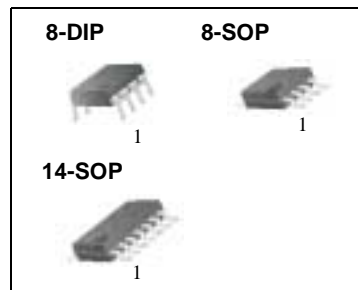
SMPS Controller

Features

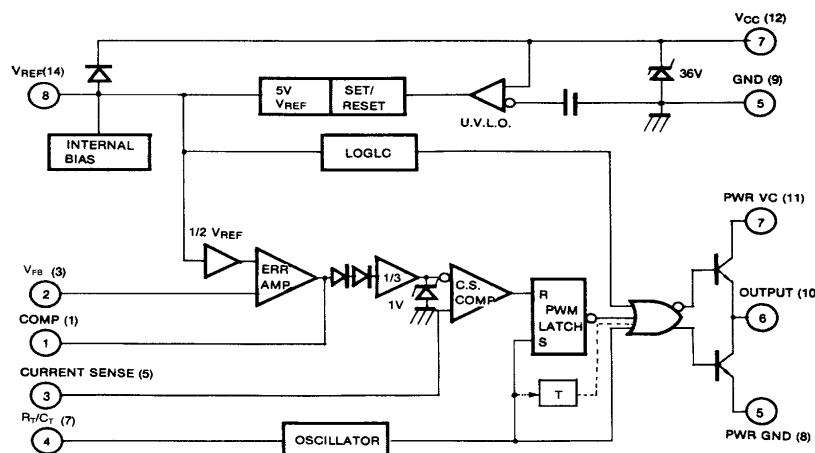
- Low Start up Current
- Maximum Duty Clamp
- UVLO With Hysteresis
- Operating Frequency up to 500KHz

Description

The UC3842/UC3843/UC3844/UC3845 are fixed frequency current-mode PWM controller. They are specially designed for Off-Line and DC to DC converter applications with minimum external components. These integrated circuits feature a trimmed oscillator for precise duty cycle control, a temperature compensated reference, high gain error amplifier, current sensing comparator and a high current totempole output for driving a Power MOSFET. The UC3842 and UC3844 have UVLO thresholds of 16V (on) and 10V (off). The UC3843 and UC3845 are 8.5V (on) and 7.9V (off). The UC3842 and UC3843 can operate within 100% duty cycle. The UC3844 and UC3845 can operate with 50% duty cycle.



Internal Block Diagram



* NORMALLY 8DIP/8SOP PIN NO.
 * () IS 14SOP PINNO.
 * TOGGLE FLIP FLOP USED ONLY IN UC3844, UC3845

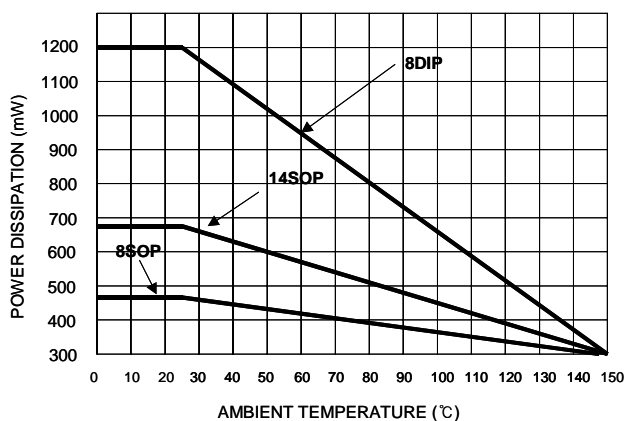
Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	30	V
Output Current	I _O	±1	A
Analog Inputs (Pin 2,3)	V _(ANA)	-0.3 to 6.3	V
Error Amp Output Sink Current	I _{SINK (E.A)}	10	mA
Power Dissipation at T _A ≤25°C (8DIP)	P _D (Note1,2)	1200	mW
Power Dissipation at T _A ≤25°C (8SOP)	P _D (Note1,2)	460	mW
Power Dissipation at T _A ≤25°C (14SOP)	P _D (Note1,2)	680	mW
Storage Temperature Range	T _{STG}	-65 ~ +150	°C
Lead Temperature (Soldering, 10sec)	T _{LEAD}	+300	°C

Note:

1. Board Thickness 1.6mm, Board Dimension 76.2mm × 114.3mm, (Reference EIA / JSED51-3, 51-7)
2. Do not exceed PD and SOA (Safe Operation Area)

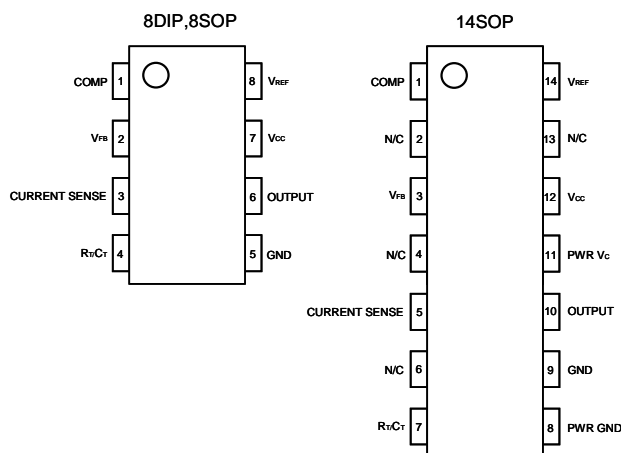
Power Dissipation Curve



Thermal Data

Characteristic	Symbol	8-DIP	8-SOP	14-SOP	Unit
Thermal Resistance Junction-ambient	R _{thj-amb} (MAX)	100	265	180	°C/W

Pin Array



Electrical Characteristics

($V_{CC}=15V$, $R_T=10k\Omega$, $C_T=3.3nF$, $T_A=0^\circ C$ to $+70^\circ C$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
REFERENCE SECTION						
Reference Output Voltage	V_{REF}	$T_J = 25^\circ C$, $I_{REF} = 1mA$	4.90	5.00	5.10	V
Line Regulation	ΔV_{REF}	$12V \leq V_{CC} \leq 25V$	-	6	20	mV
Load Regulation	ΔV_{REF}	$1mA \leq I_{REF} \leq 20mA$	-	6	25	mV
Short Circuit Output Current	I_{SC}	$T_A = 25^\circ C$	-	-100	-180	mA
OSCILLATOR SECTION						
Oscillation Frequency	f	$T_J = 25^\circ C$	47	52	57	kHz
Frequency Change with Voltage	$\Delta f/\Delta V_{CC}$	$12V \leq V_{CC} \leq 25V$	-	0.05	1	%
Oscillator Amplitude	V_{OSC}	-	-	1.6	-	V _{P-P}
ERROR AMPLIFIER SECTION						
Input Bias Current	I_{BIAS}	-	-	-0.1	-2	μA
Input Voltage	$V_{I(E>A)}$	$V_{pin1} = 2.5V$	2.42	2.50	2.58	V
Open Loop Voltage Gain	G_{VO}	$2V \leq V_O \leq 4V$ (Note3)	65	90	-	dB
Power Supply Rejection Ratio	PSRR	$12V \leq V_{CC} \leq 25V$ (Note3)	60	70	-	dB
Output Sink Current	I_{SINK}	$V_{pin2} = 2.7V$, $V_{pin1} = 1.1V$	2	7	-	mA
Output Source Current	I_{SOURCE}	$V_{pin2} = 2.3V$, $V_{pin1} = 5V$	-0.6	-1.0	-	mA
High Output Voltage	V_{OH}	$V_{pin2} = 2.3V$, $R_L = 15k\Omega$ to GND	5	6	-	V
Low Output Voltage	V_{OL}	$V_{pin2} = 2.7V$, $R_L = 15k\Omega$ to Pin 8	-	0.8	1.1	V
CURRENT SENSE SECTION						
Gain	G_V	(Note 1 & 2)	2.85	3	3.15	V/V
Maximum Input Signal	$V_{I(MAX)}$	$V_{pin1} = 5V$ (Note 1)	0.9	1	1.1	V
Power Supply Rejection Ratio	PSRR	$12V \leq V_{CC} \leq 25V$ (Note 1,3)	-	70	-	dB
Input Bias Current	I_{BIAS}	-	-	-3	-10	μA
OUTPUT SECTION						
Low Output Voltage	V_{OL}	$I_{SINK} = 20mA$	-	0.08	0.4	V
		$I_{SINK} = 200mA$	-	1.4	2.2	V
High Output Voltage	V_{OH}	$I_{SOURCE} = 20mA$	13	13.5	-	V
		$I_{SOURCE} = 200mA$	12	13.0	-	V
Rise Time	t_R	$T_J = 25^\circ C$, $C_L = 1nF$ (Note 3)	-	45	150	ns
Fall Time	t_F	$T_J = 25^\circ C$, $C_L = 1nF$ (Note 3)	-	35	150	ns
UNDER-VOLTAGE LOCKOUT SECTION						
Start Threshold	$V_{TH(ST)}$	UC3842/UC3844	14.5	16.0	17.5	V
		UC3843/UC3845	7.8	8.4	9.0	V
Min. Operating Voltage (After Turn On)	$V_{OPR(MIN)}$	UC3842/UC3844	8.5	10.0	11.5	V
		UC3843/UC3844	7.0	7.6	8.2	V

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
PWM SECTION						
Max. Duty Cycle	D(Max)	UC3842/UC3843	95	97	100	%
	D(Max)	UC3844/UC3845	47	48	50	%
Min. Duty Cycle	D(MIN)	-	-	-	0	%
TOTAL STANDBY CURRENT						
Start-Up Current	IST	-	-	0.45	1	mA
Operating Supply Current	ICC(OPR)	Vpin3=Vpin2=ON	-	14	17	mA
Zener Voltage	VZ	ICC = 25mA	30	38	-	V

Adjust VCC above the start threshold before setting at 15V

Note:

1. Parameter measured at trip point of latch
2. Gain defined as:

$$A = \frac{\Delta V_{pin1}}{\Delta V_{pin3}}, 0 \leq V_{pin3} \leq 0.8V$$

3. These parameters, although guaranteed, are not 100 tested in production.

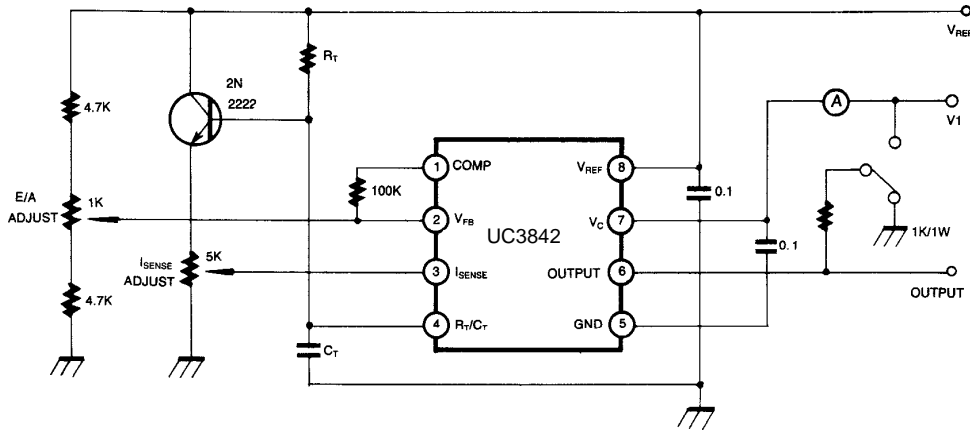


Figure 1. Open Loop Test Circuit

High peak currents associated with capacitive loads necessitate careful grounding techniques. Timing and bypass capacitors should be connected close to pin 5 in a single point ground. The transistor and 5kΩ potentiometer are used to sample the oscillator waveform and apply an adjustable ramp to pin 3.

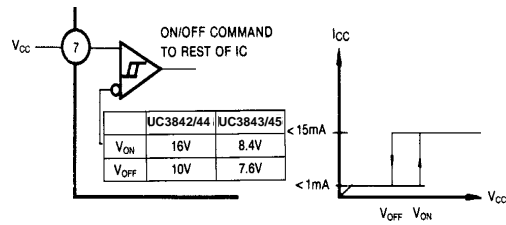


Figure 2. Under Voltage Lockout

During Under-Voltage Lock-Out, the output driver is biased to a high impedance state. Pin 6 should be shunted to ground with a bleeder resistor to prevent activating the power switch with output leakage current.

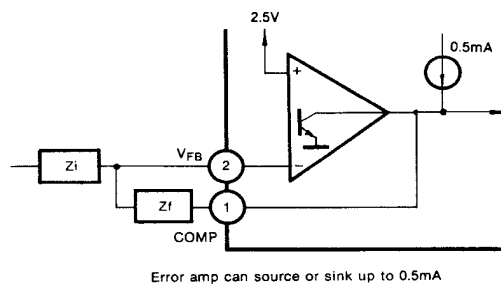


Figure 3. Error Amp Configuration

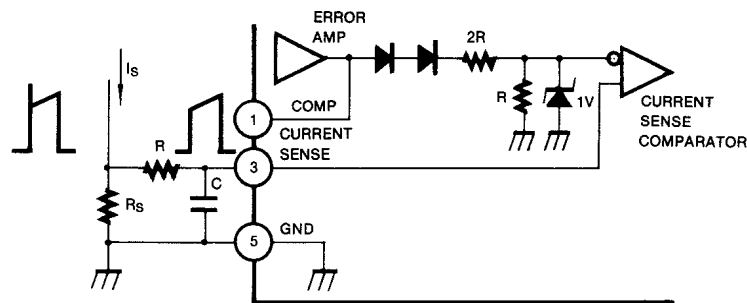


Figure 4. Current Sense Circuit

Peak current (I_S) is determined by the formula:

$$I_S(\text{MAX}) = \frac{1.0\text{V}}{R_S}$$

A small RC filter may be required to suppress switch transients.

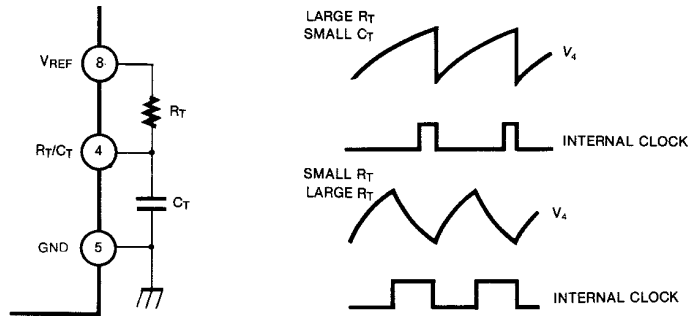


Figure 5. Oscillator Waveforms and Maximum Duty Cycle

Oscillator timing capacitor, C_T , is charged by V_{REF} through R_T and discharged by an internal current source. During the discharge time, the internal clock signal blanks the output to the low state. Selection of R_T and C_T therefore determines both oscillator frequency and maximum duty cycle. Charge and discharge times are determined by the formulas:

$$t_c = 0.55 R_T C_T$$

$$t_D = R_T C_T I_n \left(\frac{0.0063 R_T - 2.7}{0.0063 R_T - 4} \right)$$

Frequency, then, is: $f = (t_c + t_d)^{-1}$

$$\text{For } R_T > 5k\Omega, f = \frac{1.8}{R_T C_T}$$

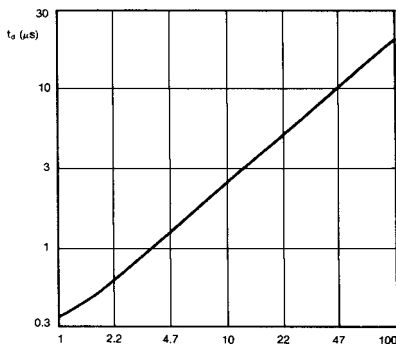


Figure 6. Oscillator Dead Time & Frequency

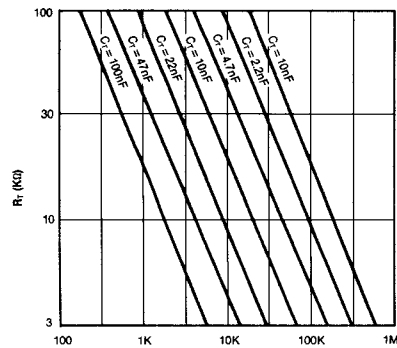


Figure 7. Timing Resistance vs Frequency

(Deadtime vs C_T $R_T > 5k\Omega$)

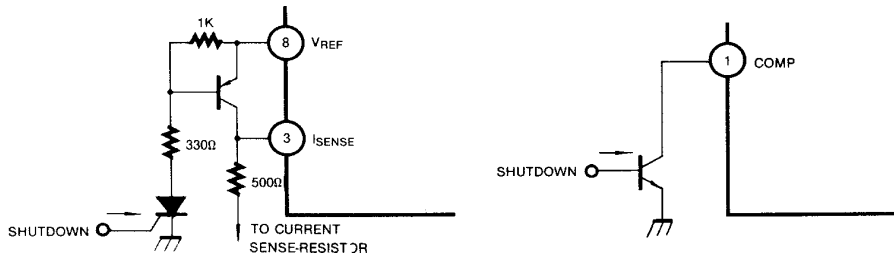


Figure 8. Shutdown Techniques

Shutdown of the UC3842 can be accomplished by two methods; either raise pin 3 above 1V or pull pin 1 below a voltage two diode drops above ground. Either method causes the output of the PWM comparator to be high (refer to block diagram). The PWM latch is reset dominant so that the output will remain low until the next clock cycle after the shutdown condition at pins 1 and/or 3 is removed. In one example, an externally latched shutdown may be accomplished by adding an SCR which will be reset by cycling VCC below the lower UVLO threshold. At this point the reference turns off, allowing the SCR to reset.

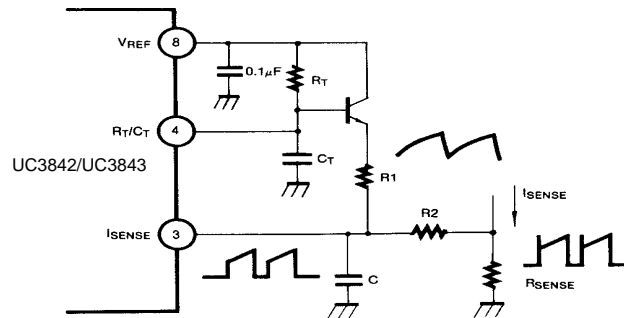


Figure 9. Slope Compensation

A fraction of the oscillator ramp can be resistively summed with the current sense signal to provide slope compensation for converters requiring duty cycles over 50%. Note that capacitor, C_T , forms a filter with R_2 to suppress the leading edge switch spikes.

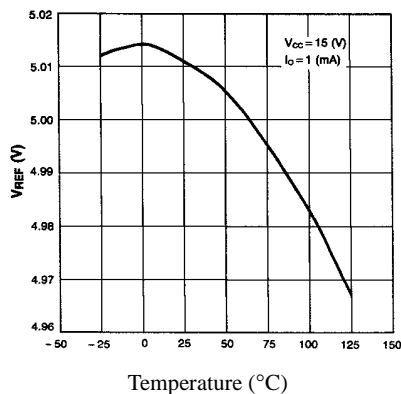


Figure 10. Temperature Drift (Vref)

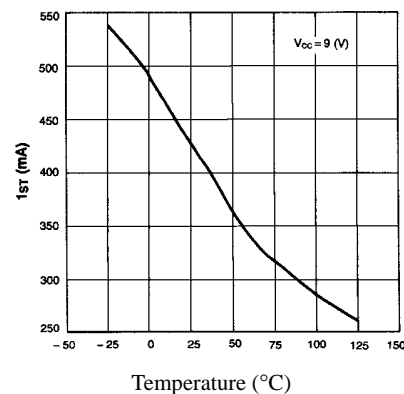


Figure 11. Temperature Drift (Ist)

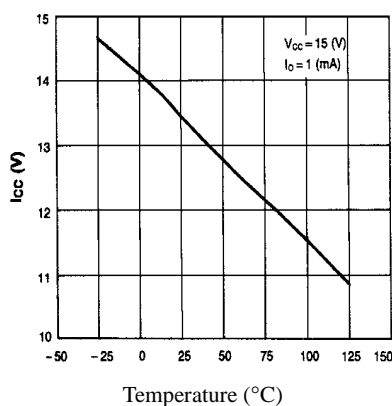
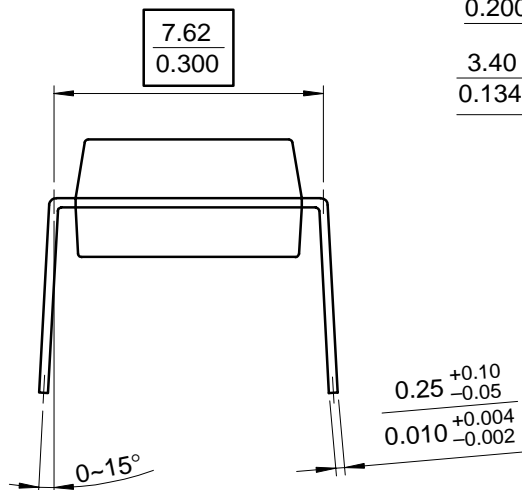
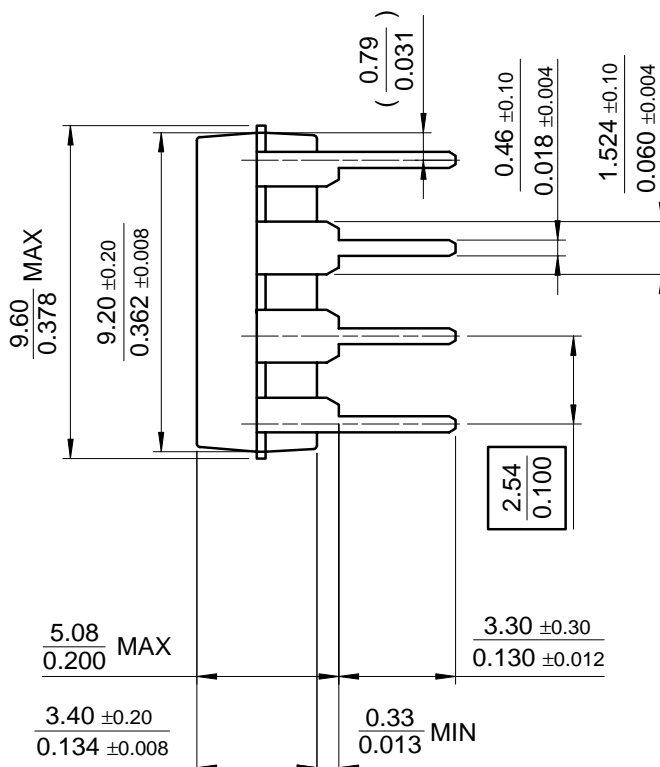
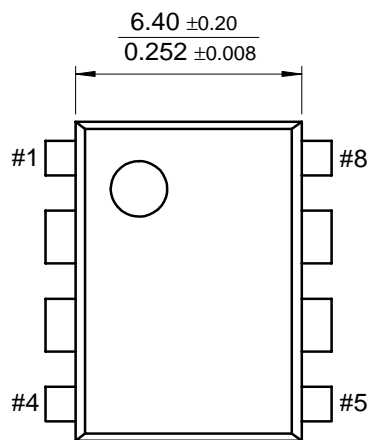


Figure 12. Temperature Drift (Icc)

Mechanical Dimensions

Package

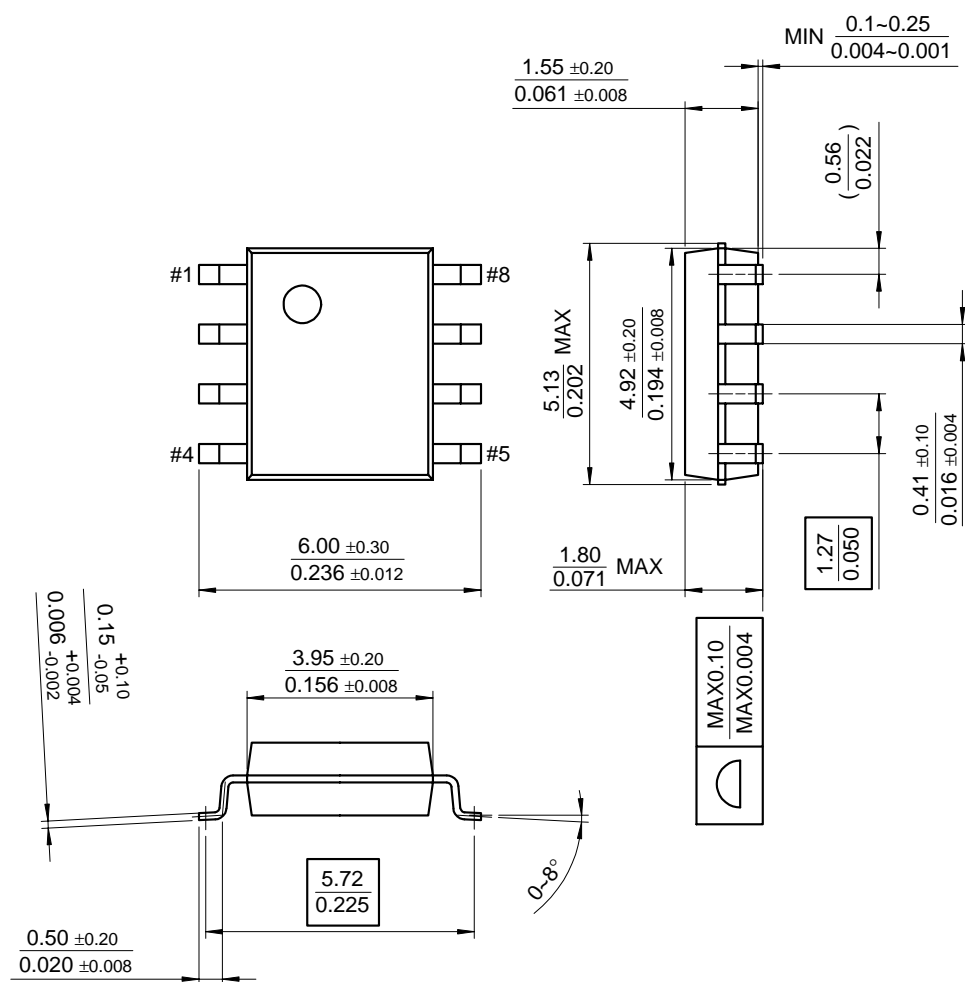
8-DIP



Mechanical Dimensions (Continued)

Package

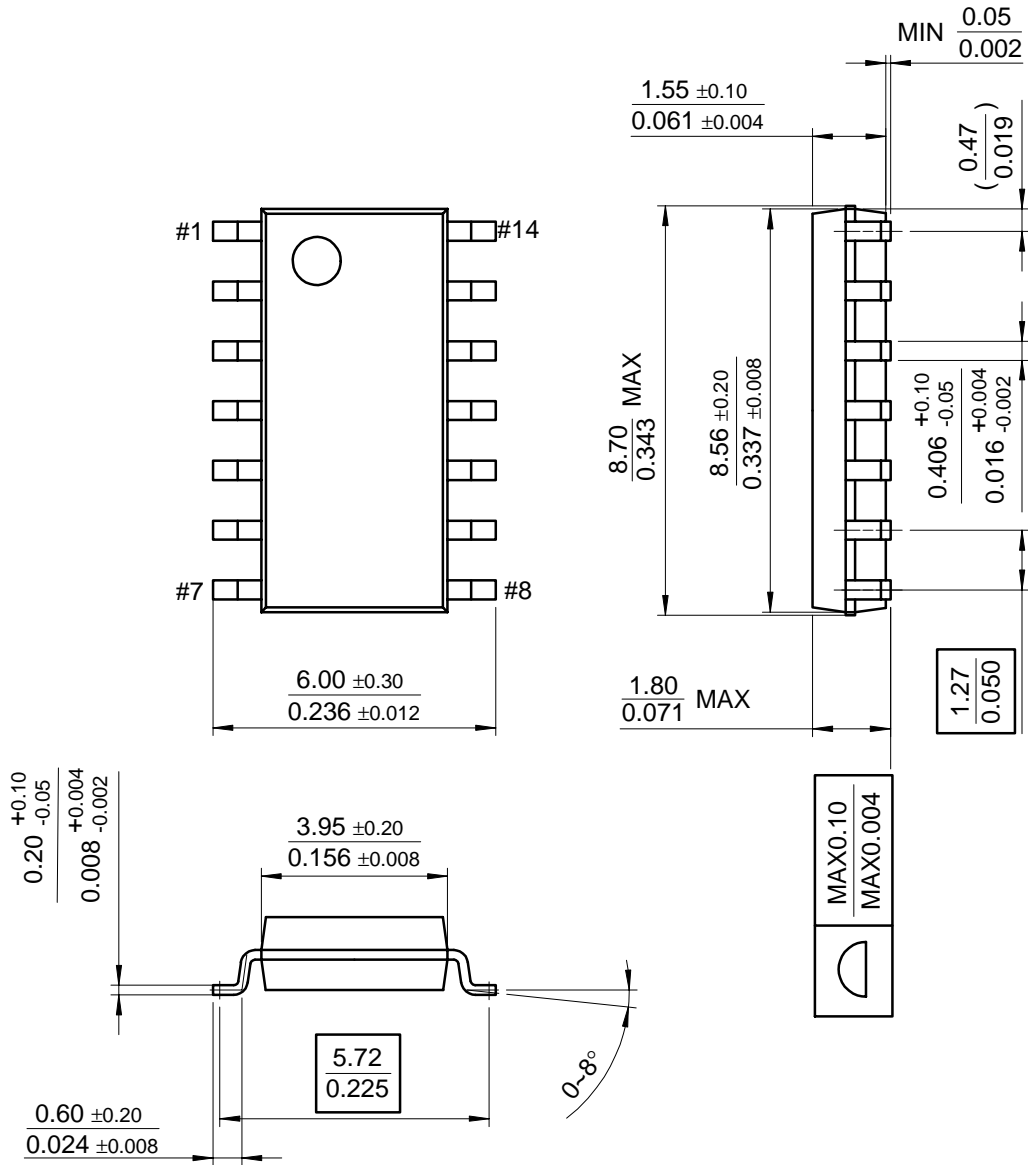
8-SOP



Mechanical Dimensions (Continued)

Package

14-SOP



Ordering Information

Product Number	Package	Operating Temperature
UC3842N	8-DIP	0 ~ + 70°C
UC3843N		
UC3844N		
UC3845N		
UC3842D1	8-SOP	
UC3843D1		
UC3844D1		
UC3845D1		
UC3842D	14-SOP	
UC3843D		
UC3844D		
UC3845D		

DISCLAIMER

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

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 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.