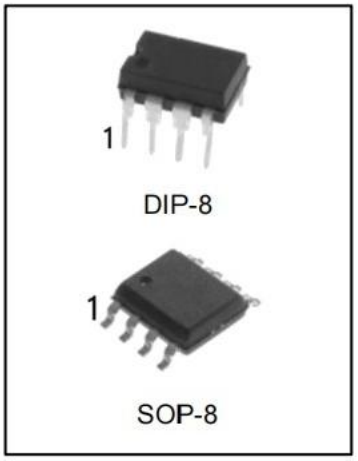
DESCRIPTION

The UC3842B/43B/44B/45B are fixed frequency current mode PWM controller.
They are specially designed for OFF Line and DC to DC converter applications with a minimal external components. Internally implemented circuits include a trimmed oscillator for precise duty cycle control, a temperature compensated reference, high gain error amplifier, current sensing comparator, and a high current totem pole output ideally suited for driving a power MOSFET. Protection circuitry includes built under voltage lockout and current limiting.
The UC3842B, UC3844B have UVLO thresholds of 16 V (on) and 10 V (off). The corresponding thresholds for the UC3843B, UC3845B are 8.4V (on) and 7.6V (off).
The UC3842B, UC3843B can operate within 100% duty cycle.
The UC3844B, UC3845B can operate within 50% duty cycle.
The UC3842B/43B/44B/45B is characterized for operation from TA = -40°C to 85°C.



Features

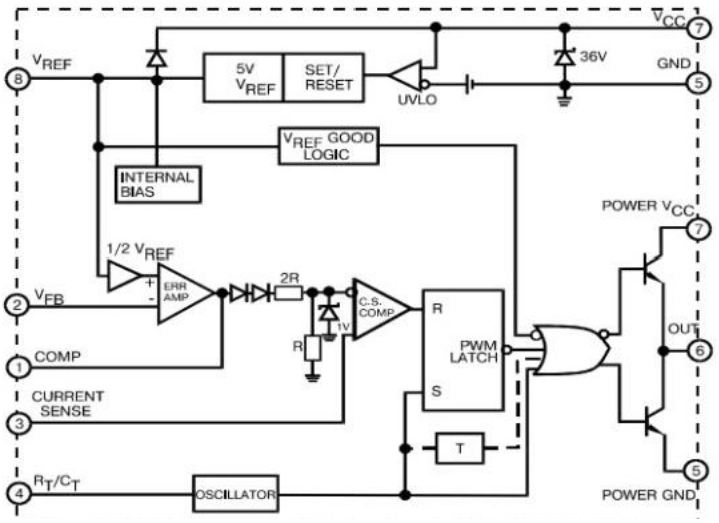
- Low Start-Up and Operating Current
- High Current Totem Pole Output
- Under voltage Lockout With Hysteresis
- Operating Frequency Up To 500KHz

Order Information

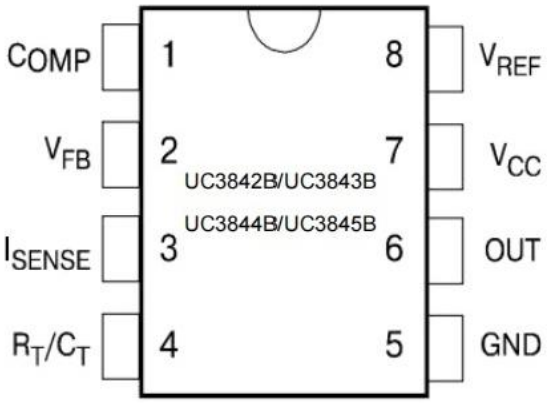
DEVICE	Package Type	MARKING	Packing	Packing Qty
UC3842BN	DIP-8	UC3842B	TUBE	2000pcs/box
UC3843BN	DIP-8	UC3843B	TUBE	2000pcs/bo>
UC3844BN	DIP-8	UC3844B	TUBE	2000pcs/bo>
UC3845BN	DIP-8	UC3845B	TUBE	2000pcs/box
UC3842BM/TR	SOP-8	UC3842B	REEL	2500pcs/reel
UC3843BM/TR	SOP-8	UC3843B	REEL	2500pcs/ree
UC3844BM/TR	SOP-8	UC3844B	REEL	2500pcs/reel
UC3845BM/TR	SOP-8	UC3845B	REEL	2500pcs/reel

BLOCK DIAGRAM

(toggle flip flop used only in UC3844B,UC3845B)



PIN CONNECTION



DIP-8/SOP-8

PIN FUNCTION

N	FUNCTION	DESCRIPTION
1	COMP	This pin is the Error Amplifier output and is made for loop compensation.
2	VFB	This is the inverting input of the Error Amplifier.It is normally connected to the switching power supply output through a resistor divider.
3	ISENSE	A voltage proportional to inductor current is connected to this input.The PWM uses this information to terminate the output switch conduction.
4	Rr/Cr	The oscillator frequency and maximum Output duty cycle are programmed by connecting resistor R_1 to Vref and capacitor Cr to ground.
5	GROUND	This pin is the combined control circuitry and power ground.
6	OUTPUT	This output directly drives the gate of a power MOSFET.Peak currents up to 1A are sourced and sink by this pin.
7	VCC	This pin is the positive supply of the integrated circuit.
8	Vref	This is the reference output.It provides charging current for capacitor Cr through resistor Rr.

ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Value	Unit
Supply Voltage (low impedance source)	VCc	30	V
Output Current	Io	1	A
Input Voltage(Analog Inputs pins 2,3)	V_1	0.3 to 5.5	V
Error Amp Output Sink Current	ISINK (E.A)	10	mA
Power Dissipation (TA=25℃)	Po	1	W
Storage Temperature Range	Tstg	-65 to150	℃
Lead Temperature (soldering 10 sec.)	TL	245	℃

Note:Absolute Maximum Ratings indicate limits beyond which damage to the device may occur.Operating Ratings indicate conditions for which the device is intended to be functional,but specific performance is not ensured.

Electrical characteristicS (Vec=15V,R_t=10kQ,Cr=3.3nF,T_4=0°C to+70C,unless otherwise specified)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Reference Section						
Reference Output Voltage	VREF	TJ=25°℃,IREF=1 mA	4.9	5.0	5.1	V
Line Regulation	AVREF	12V≤Vcc≤25V		6.0	20	mV
Load Regulation	AVREF	1 mA≤IREF ≤20mA		6.0	25	
Short Circuit Output Current	ISC	TA=25℃		-100	-180	mA
Oscillator Section						
Oscillation Frequency	f	TJ=25°℃	47	52	57	KHz
Frequency Change with Voltage	Af/△Vcc	12V≤Vcc≤25 V		0.05	1.0	%
Oscillator Amplitude	V(OSC)	(peak to peak)		1.6		V
Error Amplifier Section						
Input Bias Current	IBIAS	VrB=3V		-0.1	-2	μA
Input Voltage	V(E.A)	Vpin1=2.5V	2.42	2.5	2.58	V
Open Loop Voltage Gain	AVOL	2V≤Vo≤4V	65	90		dB
Unity Gain Bandwidth	UGBW	Tj=25℃,Note 3	0.5	0.6		MHz
Power Supply Rejection Ratio	PSRR	12V≤Vcc≤25V	60	70		dB
Output Sink Current	ISINK	Vpin2=2.7V,Vpin1=1.1V	2	7		mA
Output Source Current	ISOURCE	Vpin2=2.3V,Vpin1 =5V	-0.5	-1.0		mA
High Output Voltage	VOH	Vpin2=2.3V,RL=15KQ to GND	5.0	6.0		V
Low Output Voltage	VOL	Vpin2 =2.7V,RL=15KQ to PIN 8		0.8	1.1	
Current Sense Section						
Gain	Gv	(Note 1 &2)	2.85	3.0	3.15	VN
Maximum Input Signal	VI(MAX)	Vpin1 =5V(Note1)	0.9	1.0	1.1	V
Supply Voltage Rejection	SVR	12V≤Vcc≤25 V(Note 1)		70		dB
nput Bias Current	IBIAS	Vpin3=3V		-3.0	-10	μA
Output Section						
Low Output Voltage	VOL	IsINk =20 mA		0.08	0.4	V
		IsiNk =200 mA		1.4	2.2	
High Output Voltage	VOH	IsiNk =20 mA	13	13.5		

		Isink =200 mA	12	13.0		
Rise Time	tr	TJ=25℃,CL=1nF(Note 3)		45	150	nS
Fall Time	tr	TJ=25℃,CL=1nF(Note 3)		35	150	
Undervoltage Lockout Section						
Start Theshold	VTH(ST)	UC3842B,UC3844B	14.5	16.0	17.5	V
		UC3843B,UC3845B	7.8	8.4	9.0	
Min.Operating Voltage (After Turn On)	VOPR(min)	UC3842B,UC3844B	8.5	10	11.5	V
		UC3843B,UC3845B	7.0	7.6	8.2	
PWM Section						
Max.Duty Cycle	D(MAX)	UC3842B,UC3843B	95	97	100	%
		UC3844B,UC3845B	47	48	50	
Min.Duty Cycle	D(MAX)				0	
Total Standby Current						
Start Up Current	IST	UC3842B/43B/44B/45B		0.17	0.3	mA
Operating Supply Current	ICC(OPR)	Vpin3 =Vpin2 =0V		13	17	
Zener Voltage	Vz	Icc=25 mA	30	38		V

*Adjust VCC above the start threshold before setting it to 15V.

Note 1:Parameter measured at trip point of latch with Vpin2=0.

Note 2:Gain defined as A=△Vpin1/△Vpin3;O≤Vpin3≤0.8V.

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

APPLICATION INFORMATION

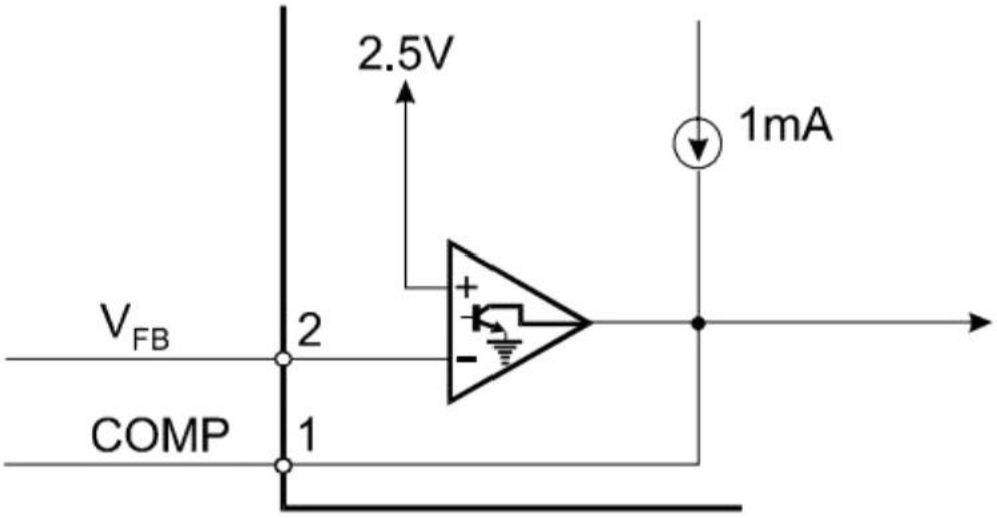


Figure 1. Error Amp Configuration

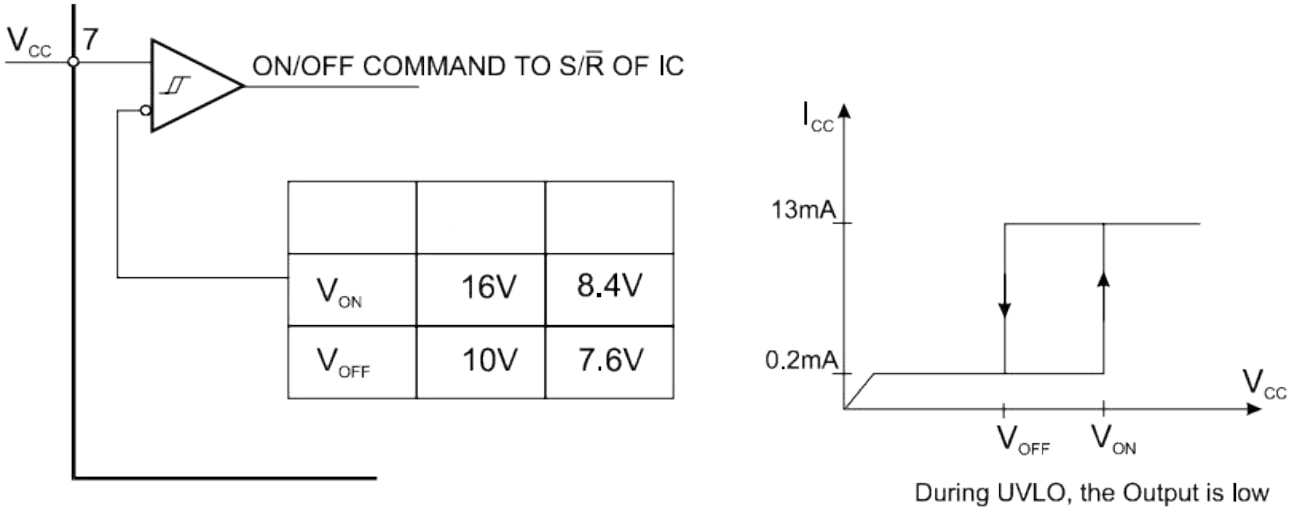


Figure 2.Under voltage Lockout

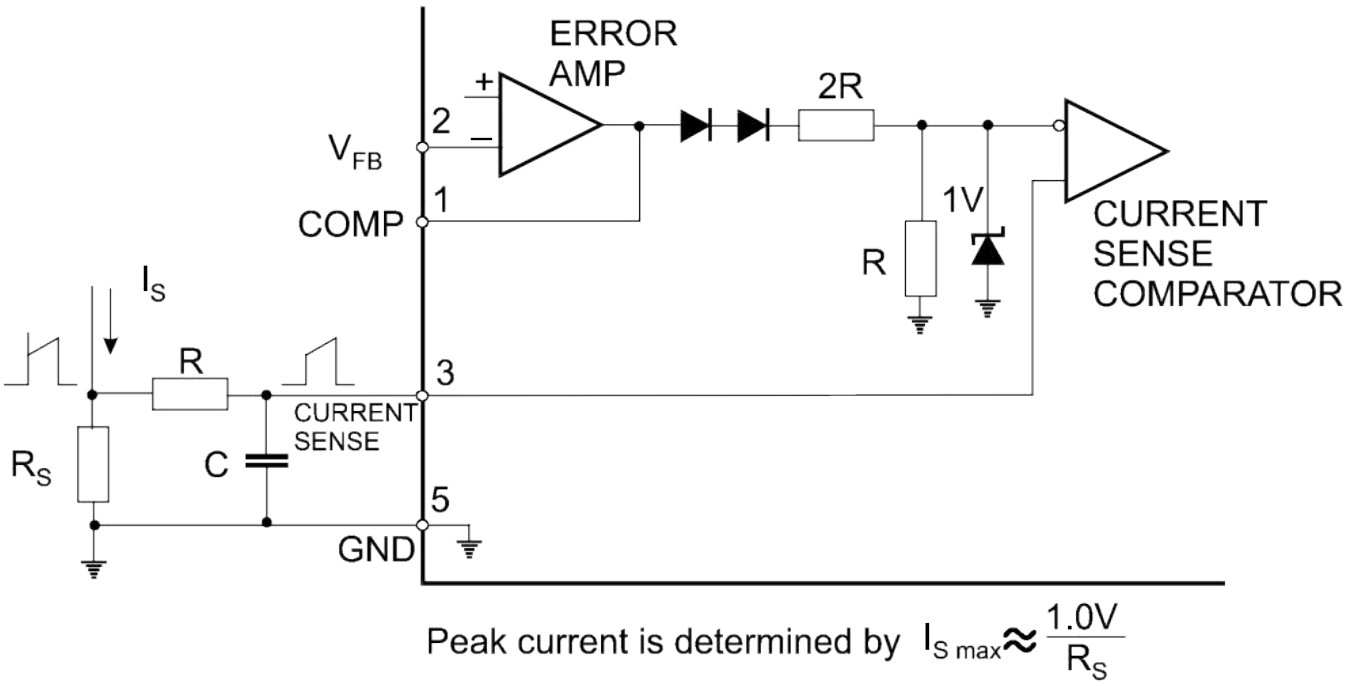


Figure 3. Current Sense Circuit

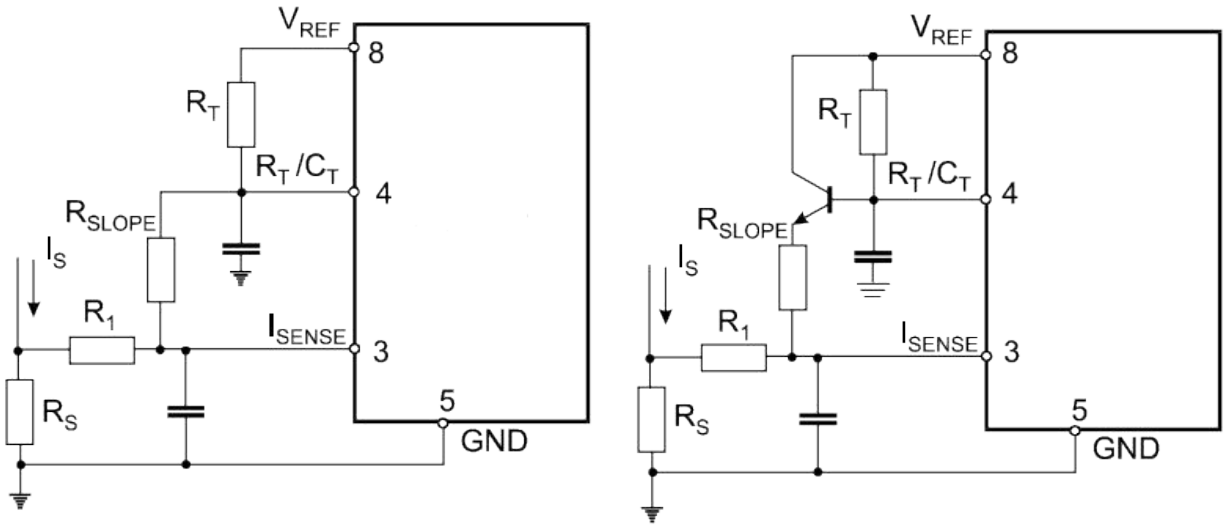
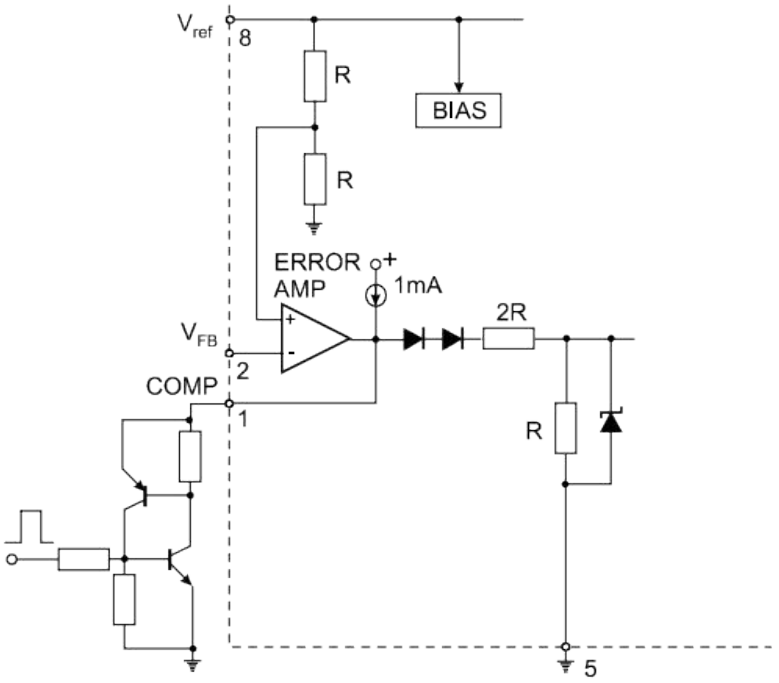
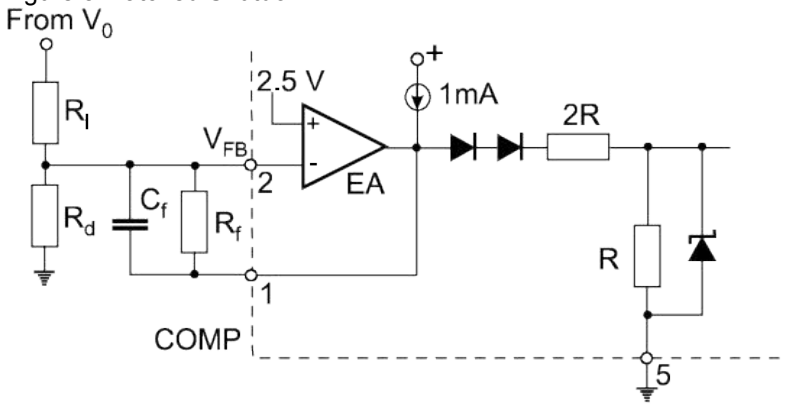


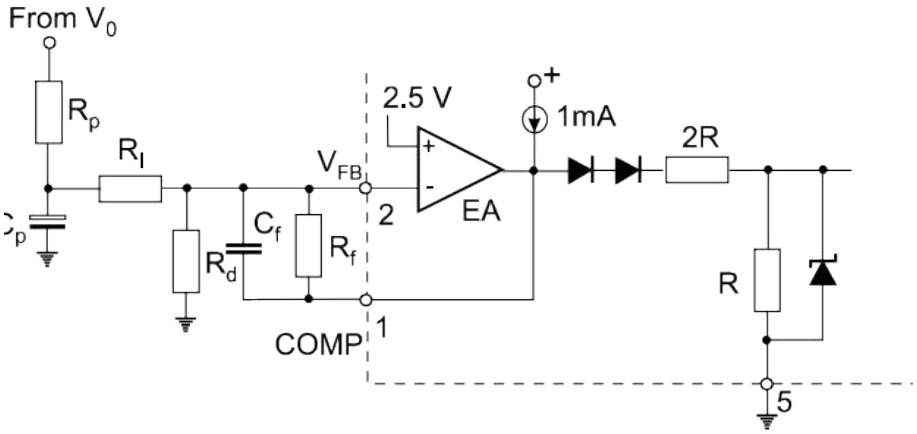
Figure 4. Slope Compensation Techniques



SCR must be selected for a holding current of less than 0.5mA.
The simple two transistor circuit can be used in place of the SCR as shown.
Figure 5. Latched Shutdown



Error Amp compensation circuit for stabilizing any current-mode topology except for boost and flyback converters operating with continuous inductor current.



Error Amp compensation circuit for stabilizing current-mode boost and flyback topologies operating with continuous inductor current.

Figure 6. Error Amplifier Compensation

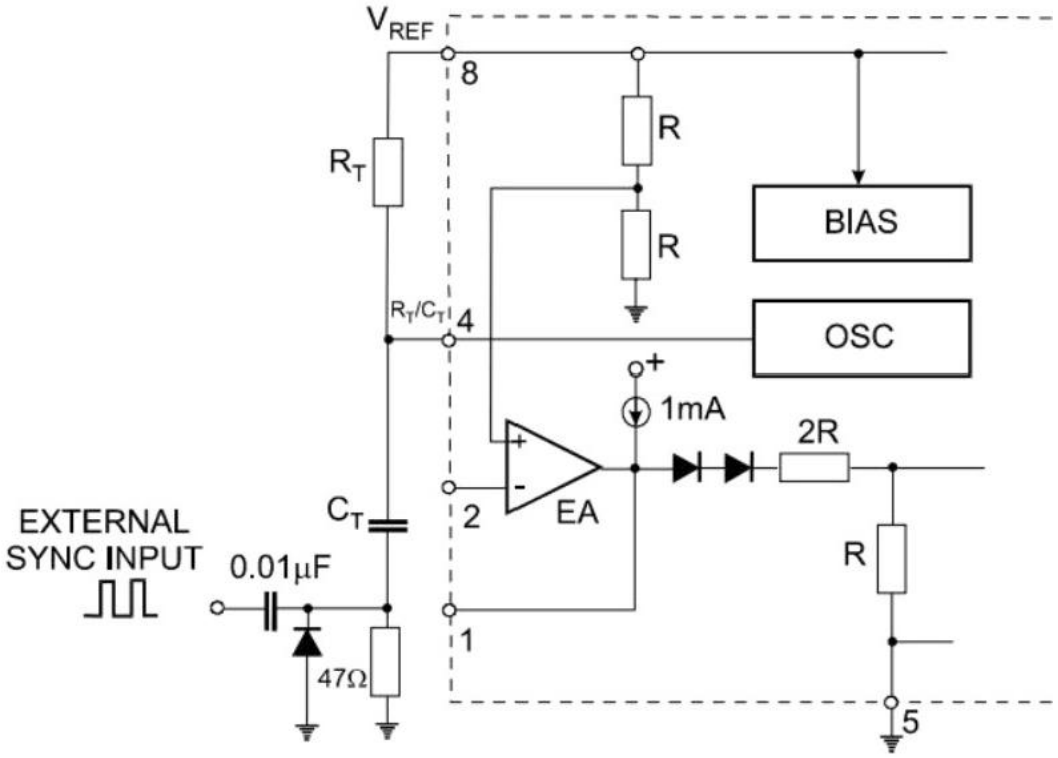


Figure 7.External Clock Synchronization

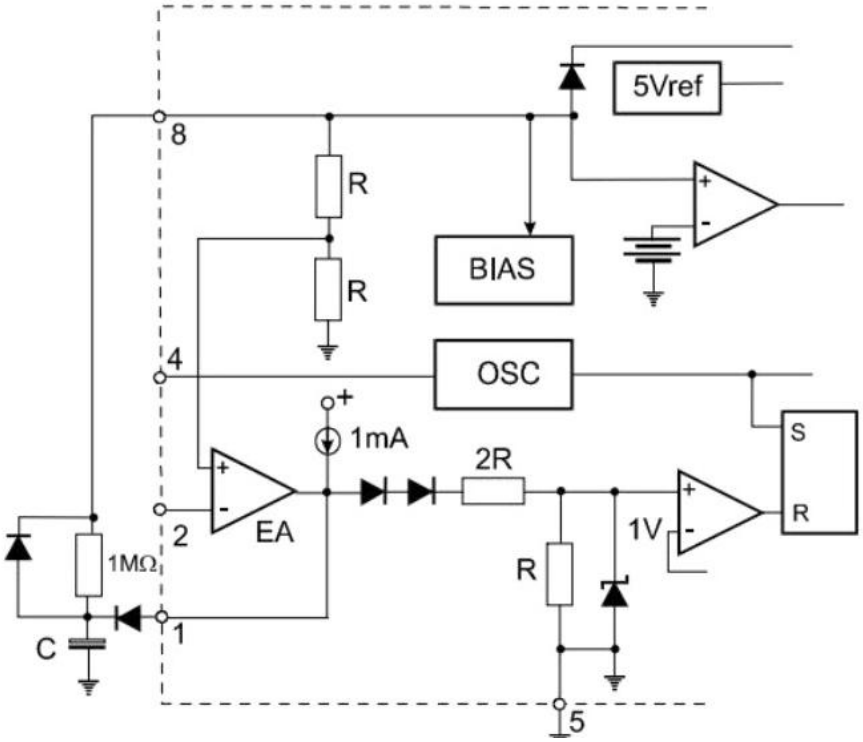


Figure 8.Soft-Start Circuit

TYPICAL PERFORMANCE CHARACTERISTICS

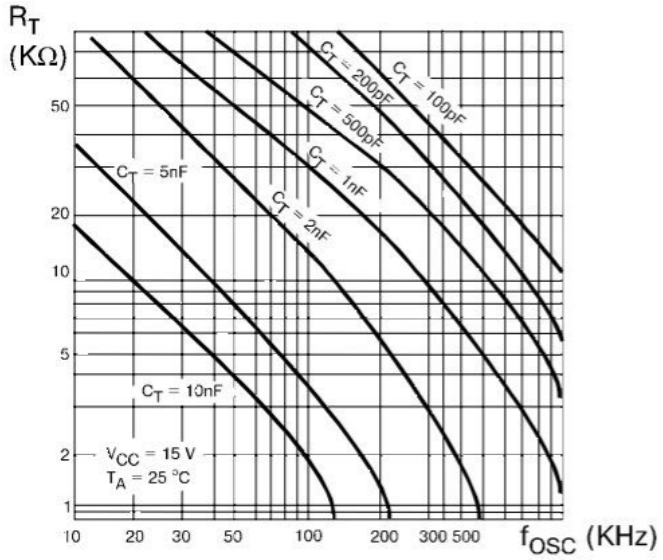


Figure 1. Timing Resistor vs. Oscillator Frequency

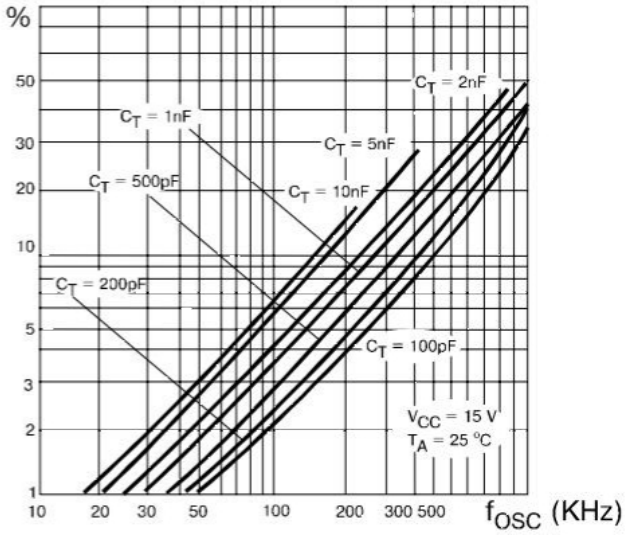


Figure 2. Output Dead-Time vs. Oscillator Frequency

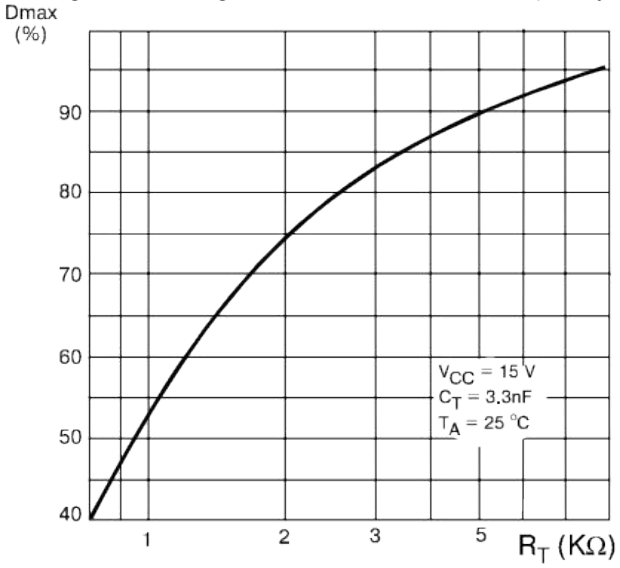


Figure 3. Maximum Output Duty Cycle vs. Timing Resistor (UC3842B/43B)

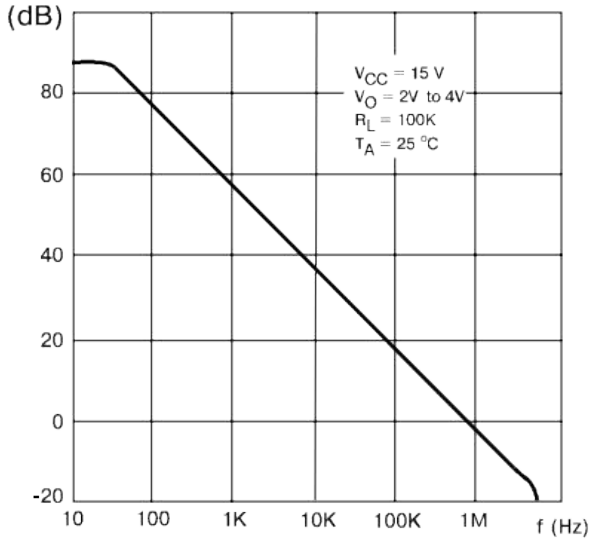
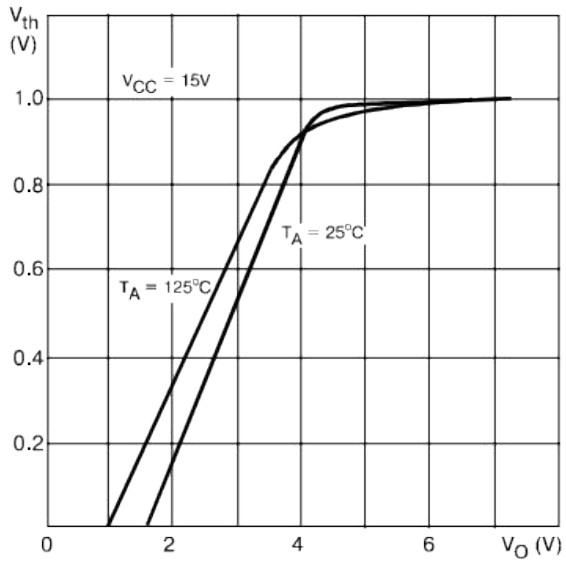


Figure 4. Error Amp Open-Loop Gain vs. Frequency



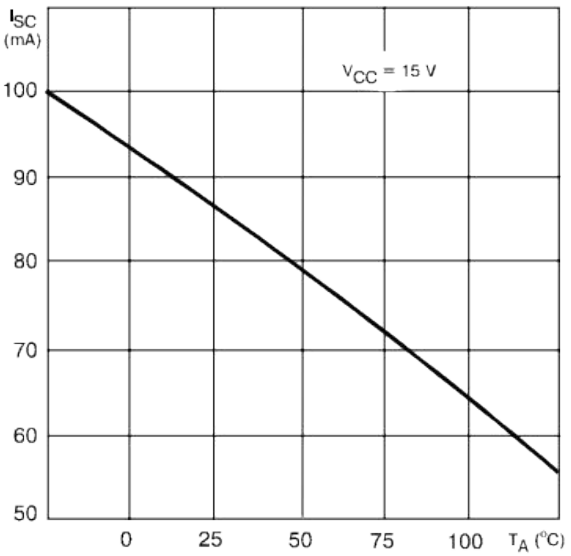
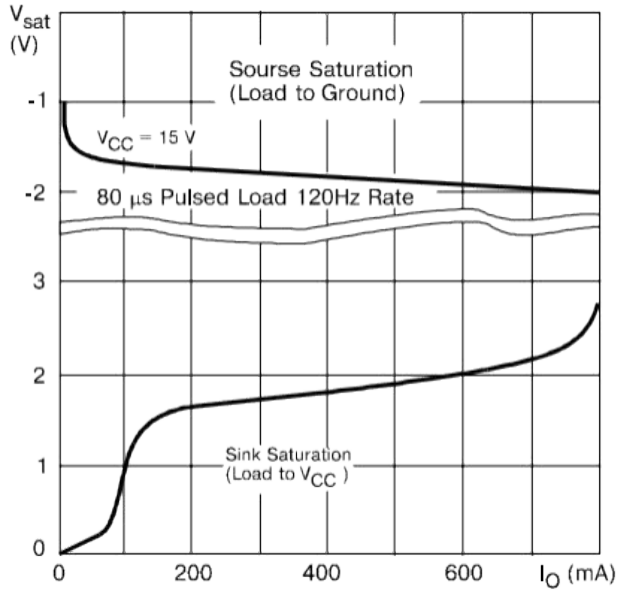


Figure 5. Current Sense Input Threshold vs. Error

Amp Output Voltage

Figure 6. Reference Short Circuit Current vs.Temperature



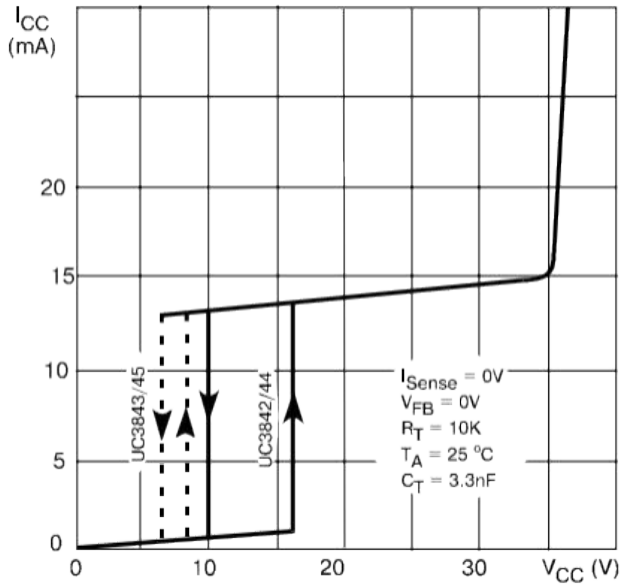


Figure 7. Output Saturation Voltage vs. Load Current
TA = 25°C
Figure 8. Supply Current vs. Supply Voltage

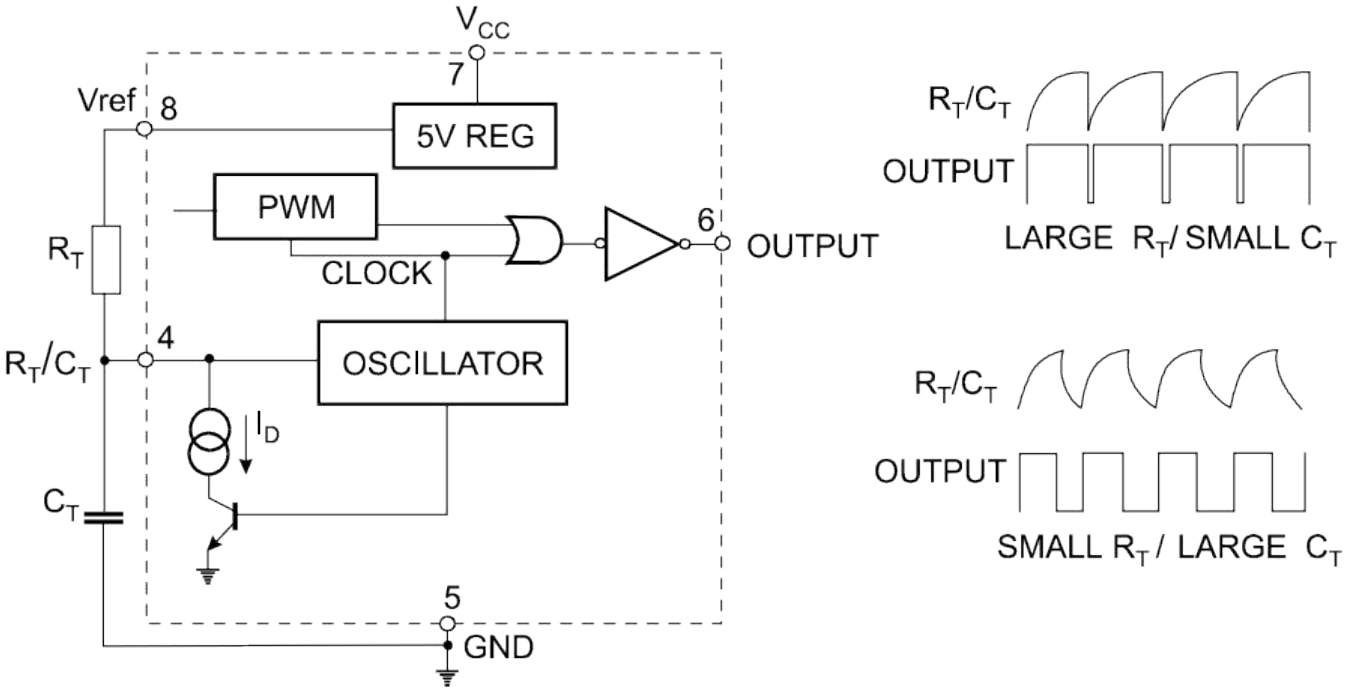
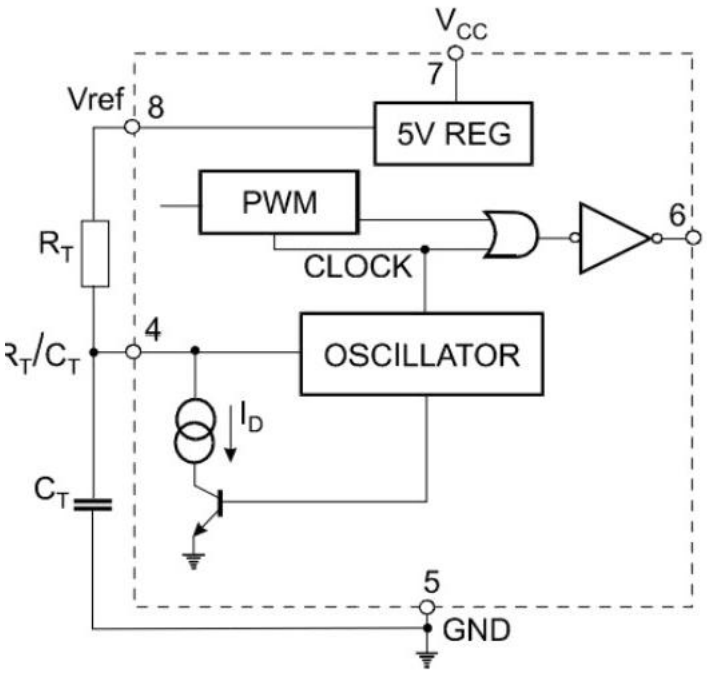


Figure 9. Oscillator and Output Waveforms



R-/CT

OUTPUT

OUTPUT LARGE R-/SMALL CT

R-/Cr

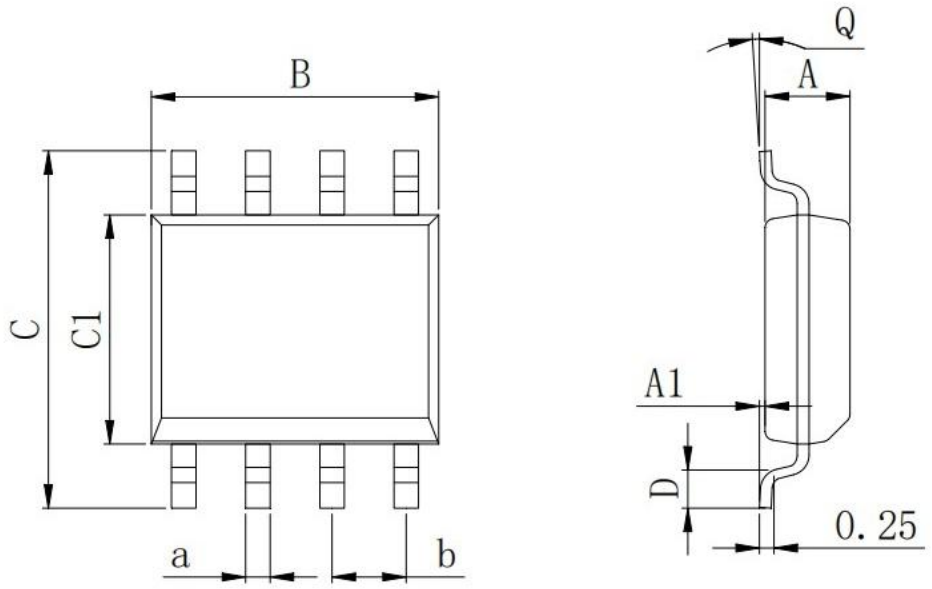
OUTPUT

SMALL Rr/LARGE C

Figure 9.Oscillator and Output Waveforms

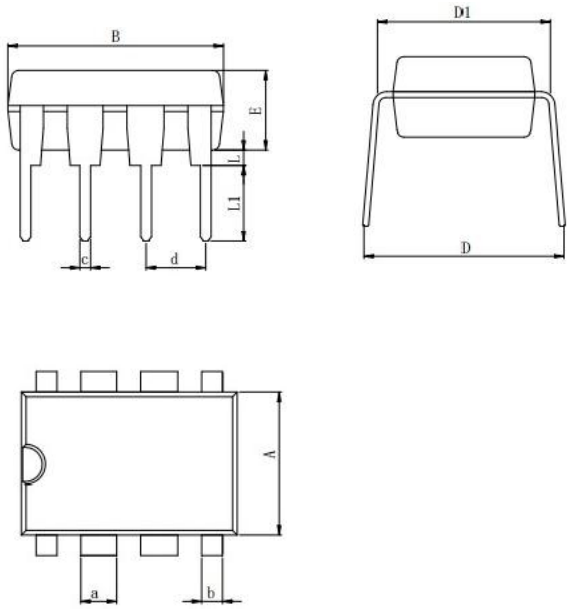
PHYSICAL DIMENSIONS

SOP-8



Dimensions In Millimeters(SOP-8)									
Symbol:	**A**	**A1**	B	C	C1	**D**	**Q**	a	b
Min:	**1.35**	0.05	**4.90**	5.80	3.80	**0.40**	0°	0.35	**1.27 BSC**
Max:	**1.55**	0.20	5.10	6.20	4.00	0.80	**8°**	0.45	

DIP-8



Dimensions In Millimeters(DIP-8)											
Symbol:	**A**	B	D	D1	E	L	L1	**a**	b	C	d
Min:	6.10	9.00	8.10	7.42	3.10	0.50	3.00	**1.50**	**0.85**	0.40	2.54 BSC
Max:	6.68	9.50	10.9	7.82	3.55	0.70	3.60	**1.55**	0.90	0.50	