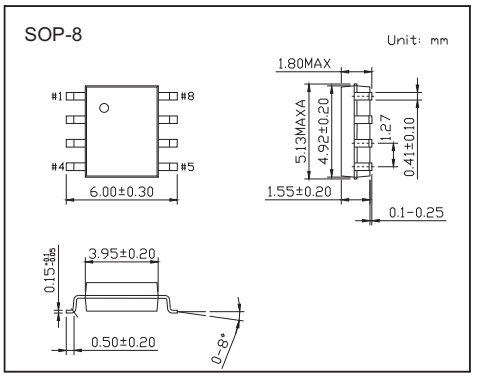
CURRENT MODE PWM CONTROLLER

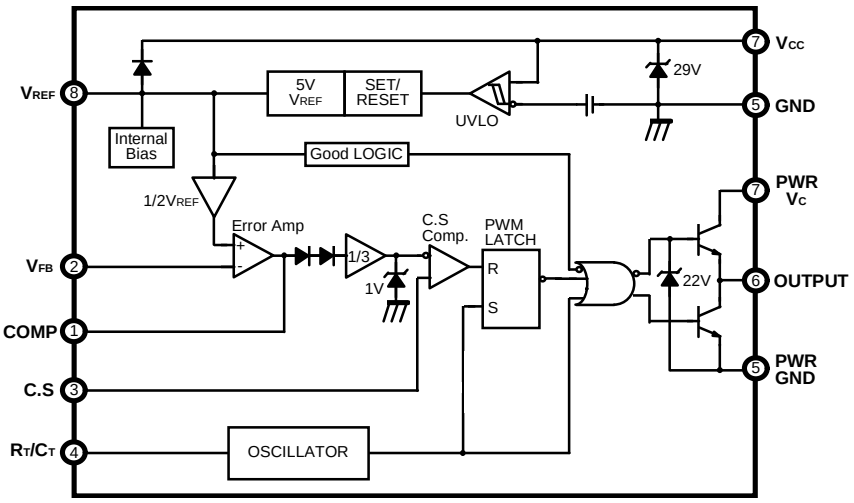
UC3842

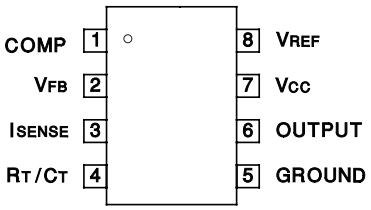
Features

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



Functional Block Diagram





Absolute Maximum Ratings Ta = 25°C

Parameter	Symbol	Ratings	Units
Supply Voltage	Vcc	30	V
Output Current	Io	±1	A
Analog Inputs	V(ANA)	-0.3 to 6.3	V
Error Amp Output Sink Current	ISINK (E.A)	10	mA
Power Dissipation at TA≤25°C	PD(Note1,2)	460	mW
Storage Temperature Range	TSTG	-65 ~ +150	°C
Lead Temperature	TLEAD	+300	°C
Thermal Resistance Junction-ambient	Rthj-a	125	°C/W

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■ Electrical Characteristics (V_{CC}=15V,R_T=10kΩ,C_T=3.3nF,T_A= 0°Cto+70°C,unless otherwise specifiec

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reference Output Voltage	V_{REF}	T_J = 25°C, I_{REF} = 1mA	4.9	5.0	5.1	V
Line Regulation	ΔV_{REF}	12V ≤ V_{CC} ≤ 25V		6	20	mV
Load Regulation	ΔV_{REF}	1mA ≤ I_{REF} ≤ 20mA		6	25	mV
Short Circuit Output Current	I_{SC}	T_A = 25°C		-100	-180	mA
Oscillation Frequency	f	T_J = 25°C	47	52	57	kHz
Frequency Change with Voltage	$\Delta f/\Delta V_{CC}$	12V ≤ V_{CC} ≤ 25V		0.2	1	%
Oscillator Amplitude	V_{OSC}			1.7		VP-P
Input Bias Current	I_{BIAS}	CURRENT SENSE SECTION		-2	-10	μA
Input Voltage	$V_{I(E>A)}$	Vpin1 = 2.5V	2.42	2.5	2.58	V
Open Loop Voltage Gain	G_{VO}	2V ≤ V_O ≤ 4V (Note3)	65	90		dB
Power Supply Rejection Ratio	P_{SRR}	12V ≤ V_{CC} ≤ 25V (Note3)	60	70		dB
Output Sink Current	I_{SINK}	Vpin2 = 2.7V, Vpin1 = 1.1V	2	70		mA
Output Source Current	I_{SOURCE}	Vpin2 = 2.3V, Vpin1 = 5V	-0.6	-1.0		mA
High Output Voltage	V_{OH}	Vpin2 = 2.3V, R_L = 15kΩ to GND	5	6		V
Low Output Voltage	V_{OL}	Vpin2 = 2.7V, R_L = 15kΩ to Pin 8		0.7	1.1	V
Gain	G_V	(Note 1 & 2)	2.85	3	3.15	V/V
Maximum Input Signal	$V_{I(MAX)}$	Vpin1 = 5V(Note 1)	0.9	1	1.1	V
Power Supply Rejection Ratio	P_{SRR}	12V ≤ V_{CC} ≤ 25V (Note 1,3)		70		dB
Input Bias Current	I_{BIAS}	ERROR AMPLIFIER SECTION		-0.3	-2	μA
Low Output Voltage	V_{OL}	I_{SINK} = 20mA		0.1	0.4	V
		I_{SINK} = 200mA		1.5	2.2	V
High Output Voltage	V_{OH}	I_{SOURCE} = 20mA	13	13.5		V
		I_{SOURCE} = 200mA	12	13.5		V
Rise Time	t_R	T_J = 25°C, C_L= 1nF (Note 3)		40	100	ns
Fall Time	t_F	T_J = 25°C, C_L= 1nF (Note 3)		40	100	ns
Start Threshold	$V_{TH(ST)}$		15	16	17	V
Min. Operating Voltage (After Turn On)	$V_{OPR(MIN)}$		9	10	11	V
Max. Duty Cycle	$D_{(Max)}$		94	96	100	%
Min. Duty Cycle	$D_{(MIN)}$				0	%
Start-Up Current	I_{ST}			0.2	0.4	mA
Operating Supply Current	$I_{CC(OPR)}$	Vpin3=Vpin2=ON		11	17	mA
Zener Voltage	V_Z	I_{CC} = 25mA		29		V

Adjust VCC above the start threshould before setting at 15V

Note:

1. Parameter measured at trip point of latch

2. Gain defined as:

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

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

UC3842

■ Typlacl Characteristics

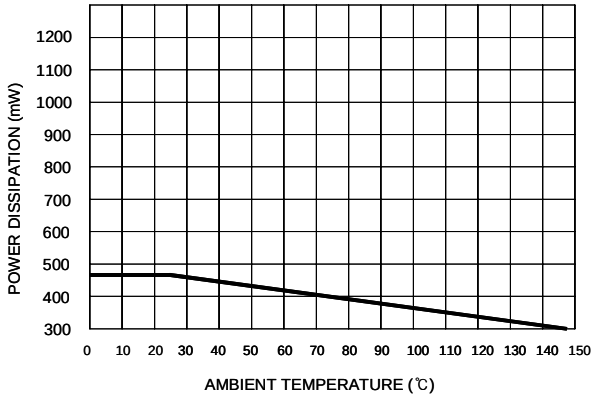


Figure 1. Power Dissipation Curve

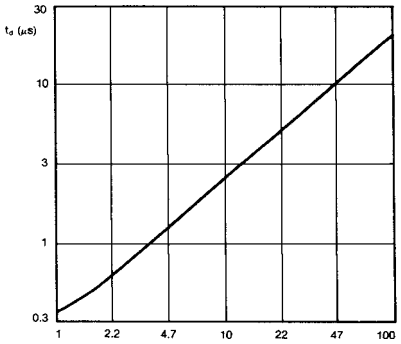


Figure 2. Oscillator Dead Time & Frequency

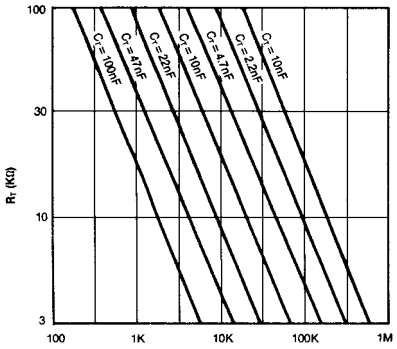
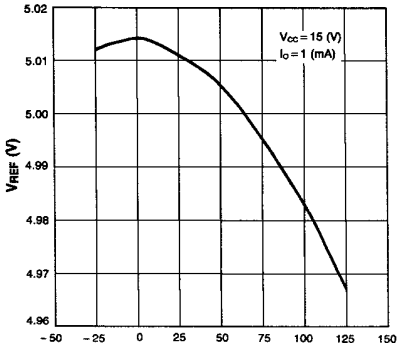
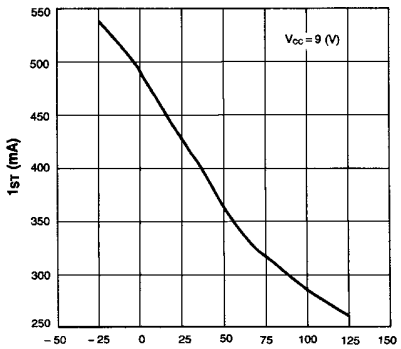


Figure 3. Timing Resistance vs Frequency



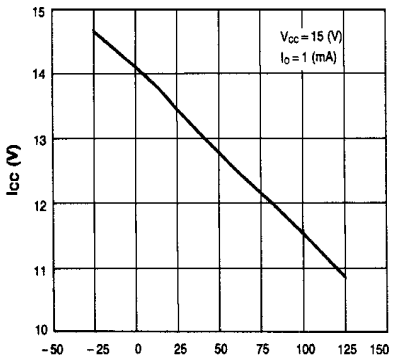
Temperature (°C)

Figure 4.Temperature Drift (Vref)



Temperature (°C)

Figure 5.Temperature Drift (Ist)



Temperature (°C)

Figure 6.Temperature Drift (Icc)