



DESCRIPTION

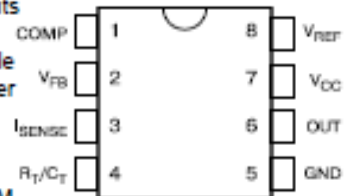
The UC3842A-BW/43A-BW/44A-BW/45A-BW, UC3842M/43M/44M/45M are fixed frequency current mode PWM controller. They are specially designed for OFF-Line and DC to DC converter applications with a minimal external components. Internally implemented circuits include a trimmed oscillator for precise duty cycle 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 UC3842A-BW, UC3844A-BW, UC3842M and UC3844M have UVLO thresholds of 16 V (on) and 10 V (off). The corresponding thresholds for the UC3843A-BW/45A-BW/43M/45M are 8.4V (on) and 7.6V (off). The UC3842A-BW, UC3843A-BW, UC3842M and UC3843M can operate within 100% duty cycle. The UC3844A-BW, UC3845A-BW, UC3844M and UC3845M can operate within 50% duty cycle.

The UC384XA-BW and UC384XM have Start-Up Current 0.17mA (typ).

The UC384XA-BW and UC384XM are revised UC384XAM and differ by higher Unity Gain bandwidth of Error Amplifier.

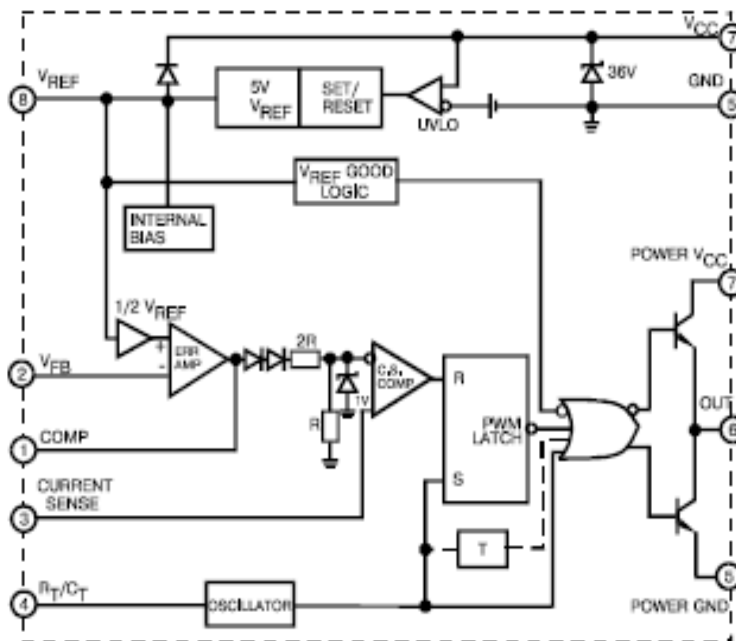
PIN CONNECTION (TOP VIEW)



FEATURES

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

BLOCK DIAGRAM
(toggle flip flop used only in UC3844, UC3845)



Absolute Maximum Ratings

Characteristic	Symbol	Value	Unit
Supply Voltage (low Impedance source)	V_{CC}	30	V
Output Current	I_o	± 1	A
Input Voltage (Analog Inputs pins 2,3)	V_i	-0.3 to 5.5	V
Error Amp Output Sink Current	$I_{SINK(EA)}$	10	mA
Power Dissipation ($T_A = 25^\circ C$)	P_D	1	W
Storage Temperature Range	T_{stg}	-65 to 150	$^\circ C$
Lead Temperature (soldering 5 sec.)	T_L	260	$^\circ C$

CURRENT MODE PWM CONTROLLER

RoHS



VSP MIKRON

UC384XA-BW, UC384XM

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)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Reference Section						
Reference Output Voltage	V_{REF}	$T_J = 25^\circ C$, $I_{REF} = 1 mA$	4.9	5.0	5.1	V
Line Regulation	ΔV_{REF}	$12V \leq V_{CC} \leq 25 V$		6.0	20	mV
Load Regulation	ΔV_{REF}	$1 mA \leq I_{REF} \leq 20mA$		6.0	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	$\Delta f/\Delta V_{CC}$	$12V \leq V_{CC} \leq 25 V$		0.05	1.0	%
Oscillator Amplitude	$V_{(OSC)}$	(peak to peak)		1.6		V
Error Amplifier Section						
Input Bias Current	I_{BIAS}	$V_{FB}=3V$		-0.1	-2	μA
Input Voltage	$V_{(IA)}$	$V_{pin1} = 2.5V$	2.42	2.5	2.58	V
Open Loop Voltage Gain	A_{VOL}	$2V \leq V_O \leq 4V$	65	90		dB
Unity Gain Bandwidth	UGBW	$T_J=25^\circ C$, Note 3	0.5	0.6		MHz
Power Supply Rejection Ratio	PSRR	$12V \leq V_{CC} \leq 25 V$	60	70		dB
Output Sink Current	I_{SINK}	$V_{pin2} = 2.7V$, $V_{pin1} = 1.1V$	2	7		mA
Output Source Current	I_{SOURCE}	$V_{pin2} = 2.3V$, $V_{pin1} = 5V$	-0.5	-1.0		mA
High Output Voltage	V_{OH}	$V_{pin2} = 2.3V$, $R_L = 15K\Omega$ to GND	5.0	6.0		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	3.0	3.15	V/V
Maximum Input Signal	$V_{(MAX)}$	$V_{pin1} = 5V$ (Note1)	0.9	1.0	1.1	V
Supply Voltage Rejection	SVR	$12V \leq V_{CC} \leq 25 V$ (Note 1)		70		dB
Input Bias Current	I_{BIAS}	$V_{pin2} = 3V$		-3.0	-10	μA
Output Section						
Low Output Voltage	V_{OL}	$I_{SINK} = 20 mA$		0.08	0.4	V
		$I_{SINK} = 200 mA$		1.4	2.2	
High Output Voltage	V_{OH}	$I_{SINK} = 20 mA$	13	13.5		V
		$I_{SINK} = 200 mA$	12	13.0		
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	
Undervoltage Lockout Section						
Start Threshold	$V_{TH(START)}$	UC3842A-BW/44A-BW/42M/44M	14.5	16.0	17.5	V
		UC3843A-BW/45A-BW/43M/45M	7.8	8.4	9.0	
Min. Operating Voltage (After Turn On)	$V_{OPR(MIN)}$	UC3842A-BW/44A-BW/42M/44M	8.5	10	11.5	V
		UC3843A-BW/45A-BW/43M/45M	7.0	7.6	8.2	
PWM Section						
Max. Duty Cycle	$D_{(MAX)}$	UC3842A-BW/43A-BW/42M/43M	95	97	100	%
		UC3844A-BW/45A-BW/44M/45M	47	48	50	
Min. Duty Cycle	$D_{(MAX)}$				0	
Total Standby Current						
Start-Up Current	I_{ST}	UC384XA-BW, UC384XM		0.17	0.3	mA
Operating Supply Current	$I_{CC(OPR)}$	$V_{pin2} = V_{pin3} = 0V$		13	17	
Zener Voltage	V_Z	$I_{CC}=25 mA$	30	38		V

* Adjust V_{CC} above the start threshold before setting it to 15V.

Note 1: Parameter measured at trip point of latch with $V_{pin2}=0$.

Note 2: Gain defined as $A=\Delta V_{pin1}/\Delta V_{pin2}$; $0 \leq V_{pin2} \leq 0.8V$.

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



PIN FUNCTION

N	FUNCTION	DESCRIPTION
1	COMP	This pin is the Error Amplifier output and is made for loop compensation.
2	V_{FB}	This is the inverting input of the Error Amplifier. It is normally connected to the switching power supply output through a resistor divider.
3	I_{SENSE}	A voltage proportional to inductor current is connected to this input. The PWM uses this information to terminate the output switch conduction.
4	R_T/C_T	The oscillator frequency and maximum Output duty cycle are programmed by connecting resistor R_T to V_{ref} and capacitor C_T 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	V_{CC}	This pin is the positive supply of the integrated circuit.
8	V_{ref}	This is the reference output. It provides charging current for capacitor C_T through resistor R_T .

APPLICATION INFORMATION

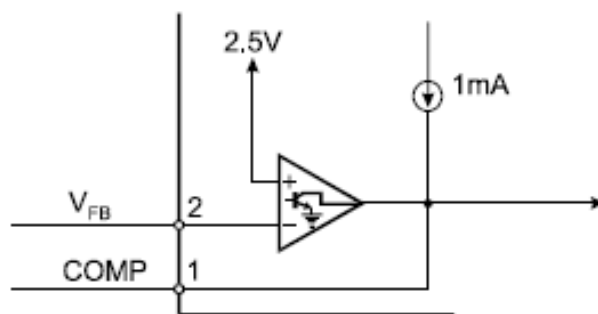


Figure 1. Error Amp Configuration

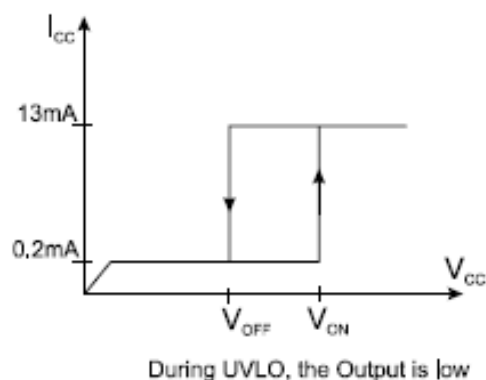
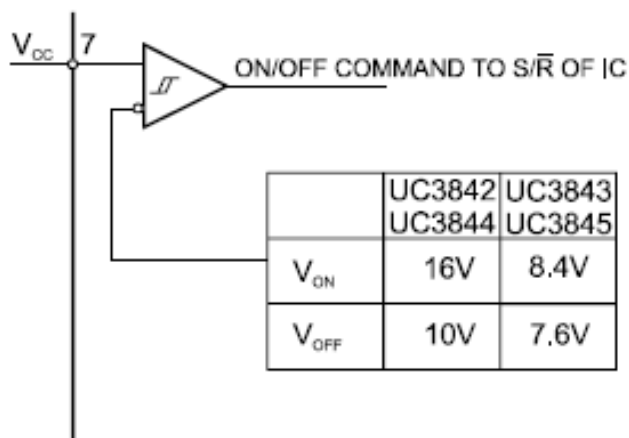
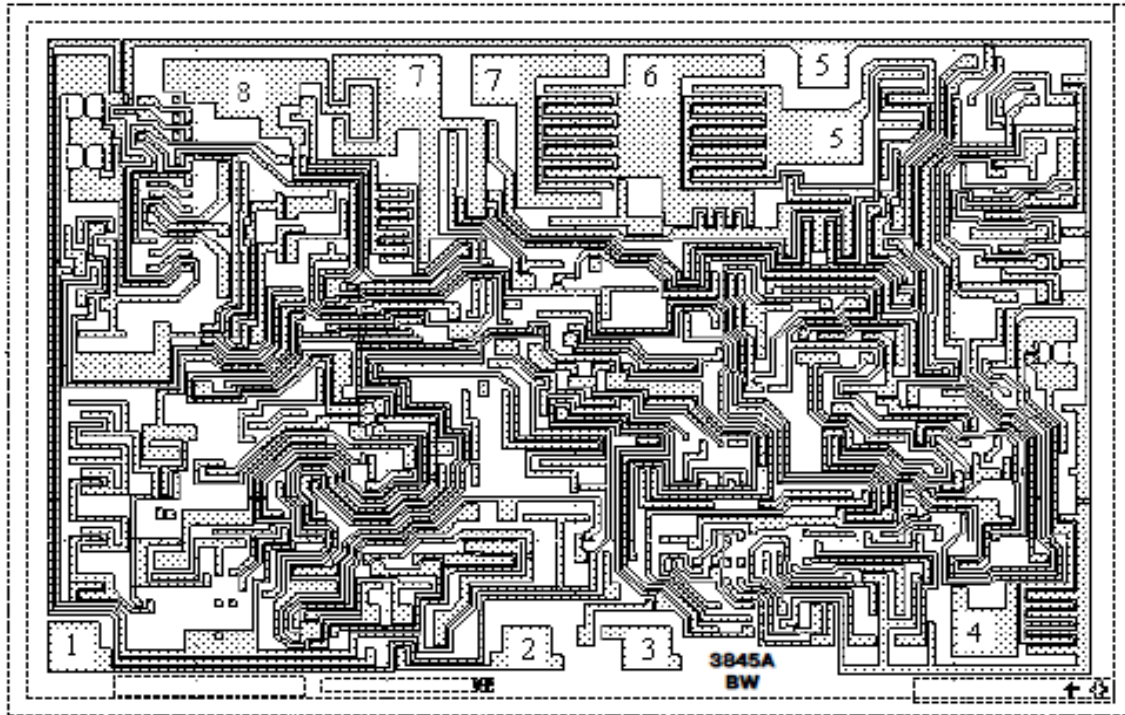


Figure 2. Under voltage Lockout



PAD LOCATION



Chip size: 2.38 x 1.63 mm

PAD LOCATION COORDINATES

Pad N	Pad Name	Coordinates μm	
		X	Y
1	COMP	90	110
2	V_{FB}	1050	110
3	I_{SENSE}	1310	110
4	R_T/C_T	2000	150
5	POWER GND	1700	1280
5	GND	1880	1450
6	OUT	1310	1410
7	POWER V_{CC}	990	1410
7	V_{CC}	815	1410
8	V_{REF}	460	1390

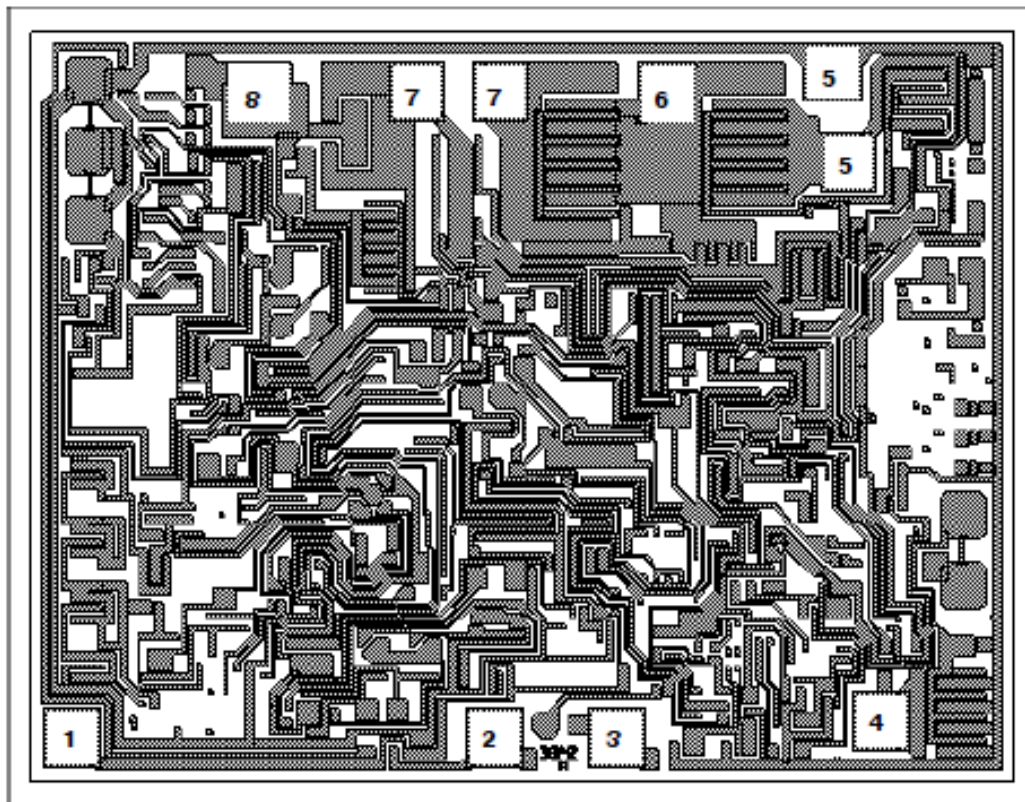
Pad size: 90 x 90 μm



VSP MIKRON

UC384XM

PAD LOCATION



Chip size: 1.82 x 1.35 mm

PAD LOCATION COORDINATES

Pad N	Pad Name	Coordinates μm	
		X	Y
1	COMP	114	115
2	V_{FB}	861	115
3	I_{SENSE}	1077	115
4	R_T/C_T	1545	143
5	POWER GND	1487	1090
5	GND	1459	1240
6	OUT	1167	1207
7	POWER V_{CC}	873	1207
7	V_{CC}	723	1207
8	V_{REF}	453	1207

Pad size: 90 x 90 μm

Wafer Thickness: 460 \pm 30 μm

Top metal: AlSi

Wafer size: 100 mm