

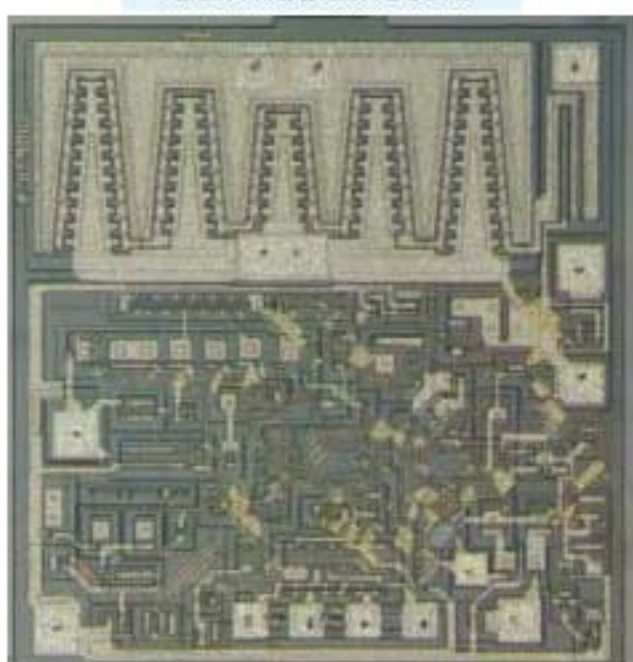
## FEATURES

Output switch current in excess of 1.5A  
2% reference accuracy; Low quiescent current 2.5mA (TYP.)  
Operating from 3V to 40V  
Frequency operation 100KHz  
Active current limiting

## APPLICATIONS

In DIE form, this device is an excellent selection for many chip and wire HYBRID CIRCUITS

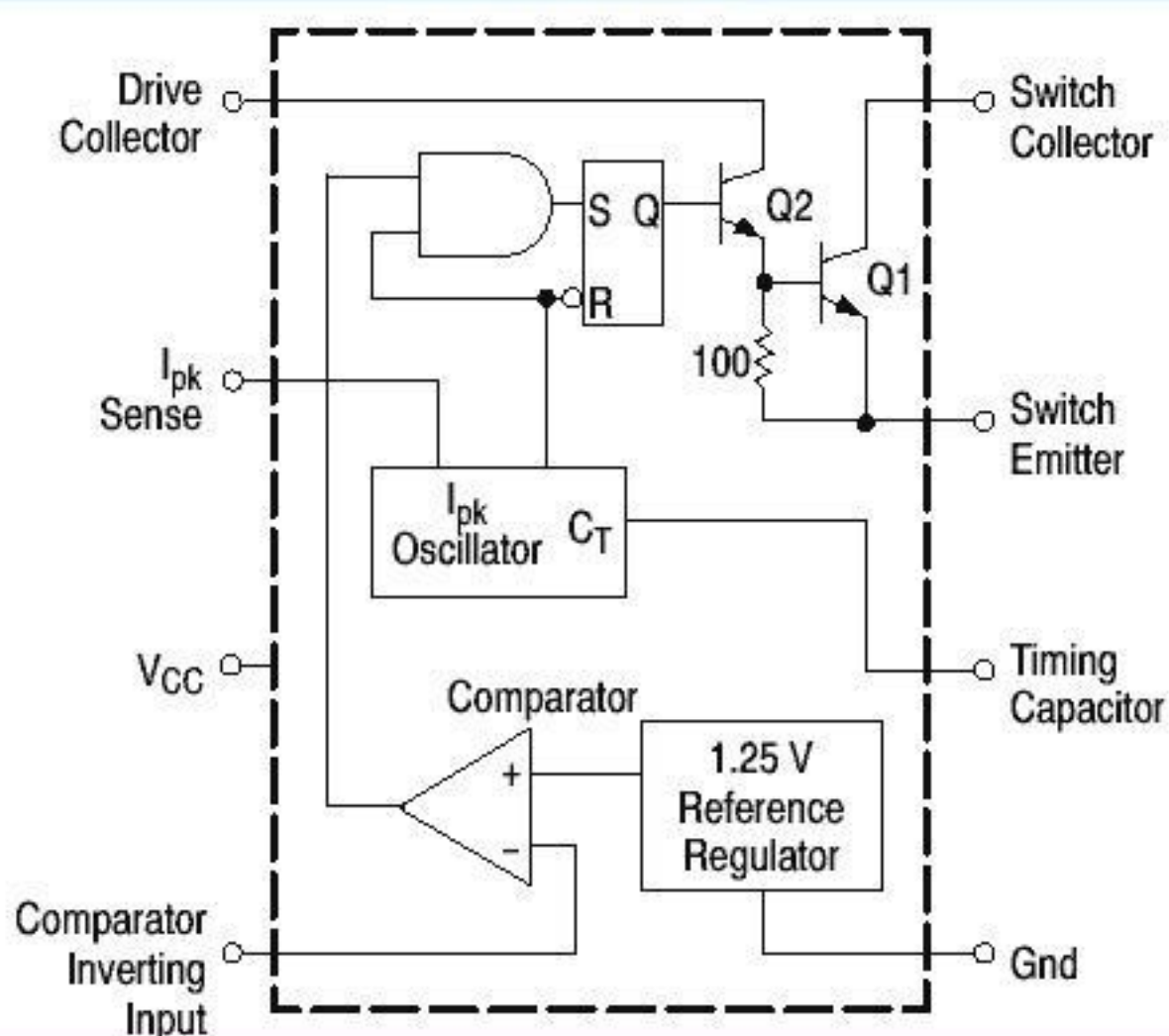
## DC-DC CONVERTER CONTROL CIRCUITS



## PRODUCT DESCRIPTION AND SHORT APPLICATION NOTE

The USM MC34063A series is a monolithic control circuit delivering the main functions for DC-DC voltage converting. The device contains an internal temperature compensated reference, comparator, duty cycle controlled oscillator with an active current limit circuit, driver and high current output switch. Output voltage is adjustable through two external resistors with a 2% reference accuracy.

## IC SCHEMATIC DIAGRAM



## MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Power Supply Voltages	$V_{CC}$	40	Vdc
Comparator Input Voltage Range	$V_{IR}$	-0.3 to +40	Vdc
Switch Collector Voltage	$V_C(\text{switch})$	40	Vdc
Switch Emitter Voltage (VPin1= 40V)	$V_E(\text{switch})$	40	Vdc
Switch Collector to Emitter Voltage	$V_{CE}(\text{switch})$	40	Vdc
Driver Collector Voltage	$V_C(\text{driver})$	40	Vdc
Driver Collector Current (Note 1.)	$I_C(\text{driver})$	100	mA
Switch Current	$I_{SW}$	1.5	A
Operating Junction Temperature	$T_J$	150	°C
Operating Ambient Temperature Range	$T_s$	0 to +70	°C
Storage Temperature Range	$T_{stg}$	-65 to +150	°C

ONLY Proper die handling equipment and procedures should be employed. Stresses beyond listed absolute maximum ratings may cause permanent damage to the device.

## ELECTRICAL CHARACTERISTIC

PARAMETER	TEST CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
<b>OSCILATOR</b>						
Frequency	$V_{Pin5}=0V, C_T=1.0nF, T_A=25^\circ C$	$f_{OSC}$	24	33	42	KHZ
Charge Current	$V_{CC}=5.0V \text{ to } 40V, T_A=25^\circ C$	$I_{chg}$	24	35	42	$\mu A$
Discharge Current	$V_{CC}=5.0V \text{ to } 40V, T_A=25^\circ C$	$I_{dischg}$	140	220	260	$\mu A$
Discharge to Charge Current Ratio	$Pin 7 \text{ to } V_{CC}, T_A=25^\circ C$	$I_{dischg}/I_{chg}$	5.2	6.5	7.5	
Current Limit Sense Voltage	$I_{chg}=I_{dischg}, T_A=25^\circ C$	$V_{Ipk}(\text{sense})$	250	300	360	mV
<b>OUTPUT SWITCH (Note 1)</b>						
Saturation Voltage, Darlington Connection	$I_{SW}=1.0A, Pins 1, 8 \text{ connected}$	$V_{CE}(\text{sat})$		1.0	1.3	V
Saturation Voltage	$I_{SW}=1.0A, R_{Pin8}=82 \text{ to } V_{CC}, \text{ Forced } \beta 20$	$V_{CE}(\text{sat})$		0.45	0.7	V
DC Current Gain	$I_{SW}=1.0A, V_{CE}=5.0V, T_A=25^\circ C$	$h_{FE}$	50	75		
Collector Off-State Current	$V_{CE}=40V$	$I_C(\text{off})$		0.01	100	$\mu A$
<b>COMPARATOR</b>						
Threshold Voltage	$T_A=25^\circ C; TA=T_{low} \text{ to } T_{high}$	$V_{th}$	1.225 1.21	1.25 -	1.275 1.29	V
Threshold Voltage Line Regulation	$V_{CC}=3.0V \text{ to } 40V$	$Reg_{line}$		1.4	5.0	mV
Input Bias Current	$V_{in}=0V$	$I_{IB}$		-20	-400	nA
<b>TOTAL DEVICE</b>						
Supply Current	$V_{CC}=5.0V \text{ to } 40V, C_T=1.0nF, Pin 7=V_{CC}, V_{Pin5}>V_{th}, Pin2=GND, \text{ Remaining pins open}$	$I_{CC}$			4.0	mA

(NOTE 1) Low duty cycle pulse techniques are used during test to maintain junction temperature as close to ambient temperature as possible.

## GENERAL DIE INFORMATION

Substrate	Thickness (mils)	Die size (mils) [mm]	Bonding pads	Backside metal
Silicon	10±1	(67.7×71.6) [1.72×1.82]	min 4×4 mils, 1 $\mu$ m thick, aluminium	Backside of the die is coated with 0.5 $\mu$ m GOLD, which makes it compatible with AuSi or AuGe die attach.

All US Microwaves products are available in die form. Typical delivery for die products is 2-3 weeks ARO. For Custom designs, delivery is 3-4 weeks ARO. Certain items may be available from stock. Inventory is periodically updated. All devices for chip and wire applications are 100% tested, visual inspected and shipped in wafer packs (WP). For high volume automated assembly, MIS chip capacitors are supplied as 4" wafers 100% tested, inked and diced on expanded film frame (FF).

## TECHNOLOGY DESCRIPTION: SEMICONDUCTOR-MANUFACTURING

These integrated Circuits are manufactured with medium voltage junction isolated bipolar process, junction capacitors, diffused resistors and precision thin film resistors. The bond pad metallization is standard 1 $\mu$ m Aluminium. The backside of the die is coated with 0.5 $\mu$ m GOLD, which makes it compatible with AuSi or AuGe die attach.

All US Microwaves products are manufactured using GOLDCHIP TECHNOLOGY™ a trade mark of Semiconix Corporation.

## DIE LAYOUT - MECHANICAL SPECIFICATIONS

PAD #	FUNCTION
1	Switch collector
2	Switch emitter
3	Timing capacitor
4	GND
5	Comparator Inverting Input
6	Vcc
7	Ipk sense
8	Driver Collector

