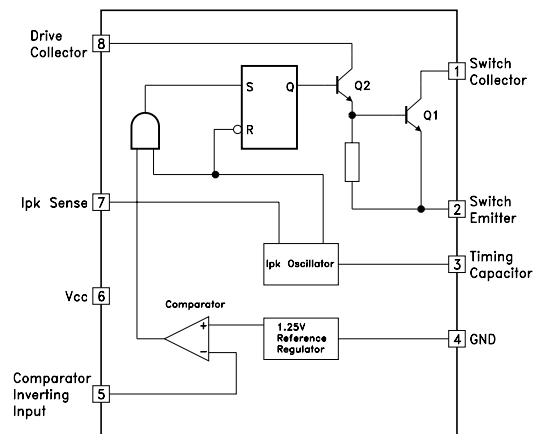
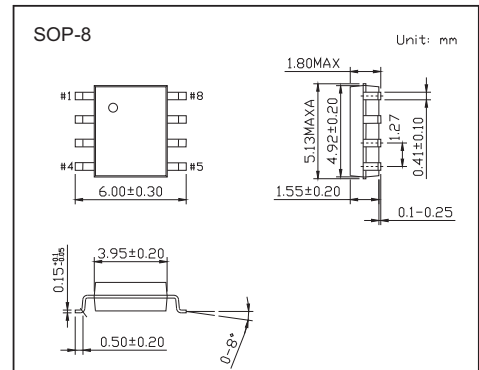


## 1.5 A, Step-Up/Down/Inverting Switching Regulators

## MC34063A

## Features

- Low Standby Current
- Current Limiting
- Output Switch Current to 1.5 A
- Output Voltage Adjustable
- Frequency Operation to 100 kHz
- Precision 2% Reference

Absolute Maximum Ratings  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Rating	Unit
Power Supply Voltage	V <sub>CC</sub>	40	V
Comparator Input Voltage Range	V <sub>IR</sub>	-0.3 to +40	V
Switch Collector Voltage	V <sub>C(switch)</sub>	40	V
Switch Emitter Voltage (V <sub>Pin 1</sub> = 40 V)	V <sub>E(switch)</sub>	40	V
Switch Collector to Emitter Voltage	V <sub>CE(switch)</sub>	40	V
Driver Collector Voltage	V <sub>C(driver)</sub>	40	V
Driver Collector Current (Note 1)	I <sub>C(driver)</sub>	100	mA
Switch Current	I <sub>SW</sub>	1.5	A
Power Dissipation and Thermal Characteristics $T_A = 25^\circ\text{C}$	P <sub>D</sub>	625	mW
Thermal Resistance	R <sub>θJA</sub>	160	°C/W
Operating Junction Temperature	T <sub>J</sub>	150	°C
Operating Ambient Temperature Range	T <sub>A</sub>	0 to +70	°C
Storage Temperature Range	T <sub>stg</sub>	-65 to +150	°C

NOTES: 1. Maximum package power dissipation limits must be observed.

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Electrical Characteristics  $T_A = 25^\circ\text{C}$  ( $V_{CC} = 5.0\text{ V}$ ,  $T_A = T_{\text{low}}$  to  $T_{\text{high}}$  [Note 2], unless otherwise specified.)

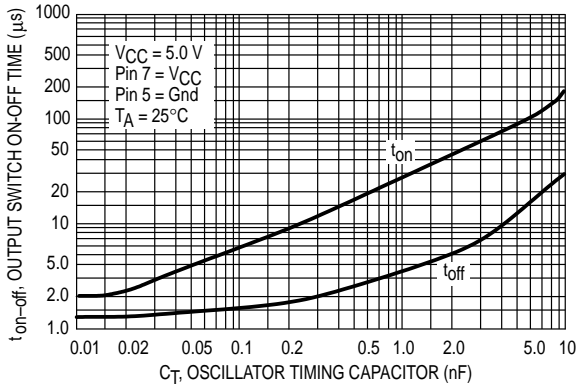
Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Frequency	$f_{\text{osc}}$	$V_{\text{Pin } 5} = 0\text{ V}$ , $C_T = 1.0\text{ nF}$ , $T_A = 25^\circ\text{C}$	24	33	42	kHz
Charge Current	$I_{\text{chg}}$	$V_{CC} = 5.0\text{ V to } 40\text{ V}$ , $T_A = 25^\circ\text{C}$	24	35	42	$\mu\text{A}$
Discharge Current	$I_{\text{dischg}}$	$V_{CC} = 5.0\text{ V to } 40\text{ V}$ , $T_A = 25^\circ\text{C}$	140	220	260	$\mu\text{A}$
Discharge to Charge Current Ratio	$I_{\text{dischg}}/I_{\text{chg}}$	Pin 7 to $V_{CC}$ , $T_A = 25^\circ\text{C}$	5.2	6.5	7.5	
Current Limit Sense Voltage	$V_{\text{ipk(sense)}}$	$I_{\text{chg}} = I_{\text{dischg}}$ , $T_A = 25^\circ\text{C}$	250	300	350	mV
Saturation Voltage, Darlington Connection	$V_{CE(\text{sat})}$	$I_{\text{SW}} = 1.0\text{ A}$ , Pins 1, 8 connected		1.0	1.3	V
Saturation Voltage (Forced $\beta = 20$ )	$V_{CE(\text{sat})}$	$I_{\text{SW}} = 1.0\text{ A}$ , $R_{\text{Pin } 8} = 82\ \Omega$ to $V_{CC}$ , Forced $\beta = 20$		0.45	0.7	V
DC Current Gain	$h_{FE}$	$I_{\text{SW}} = 1.0\text{ A}$ , $V_{CE} = 5.0\text{ V}$ , $T_A = 25^\circ\text{C}$	50	75		
Collector Off-State Current	$I_{C(\text{off})}$	$V_{CE} = 40\text{ V}$		0.01	100	$\mu\text{A}$
Threshold Voltage	$V_{\text{th}}$	$T_A = 25^\circ\text{C}$	1.225	1.25	1.275	V
		$T_A = T_{\text{low}}$ to $T_{\text{high}}$	1.21		1.29	
Threshold Voltage Line Regulation	$\text{Reg}_{\text{line}}$	$V_{CC} = 3.0\text{ V to } 40\text{ V}$		1.4	5.0	mV
Input Bias Current	$I_{\text{IB}}$	$V_{\text{in}} = 0\text{ V}$		-20	-400	nA
Supply Current	$I_{CC}$	$V_{CC} = 5.0\text{ V to } 40\text{ V}$ , $C_T = 1.0\text{ nF}$ , Pin 7 = $V_{CC}$ ,			4.0	mA
$V_{\text{Pin } 5} > V_{\text{th}}$ , Pin 2 = GND, remaining pins open		$V_{\text{Pin } 5} > V_{\text{th}}$ , Pin 2 = Gnd, remaining pins open				

NOTES: 2.  $T_{\text{low}} = 0^\circ\text{C}$ ,  $T_{\text{high}} = +70^\circ\text{C}$

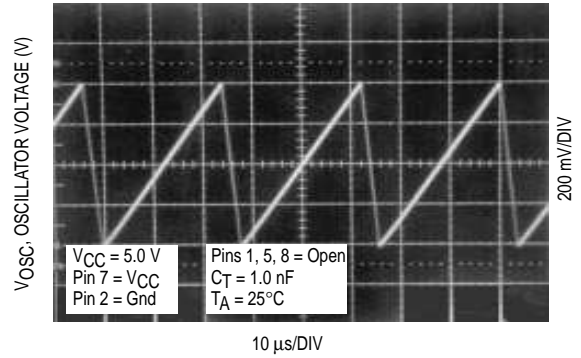
# MC34063A

## Typical Characteristics

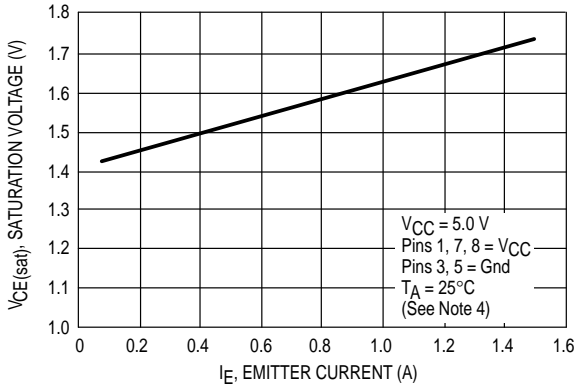
**Figure 1. Output Switch On-Off Time versus Oscillator Timing Capacitor**



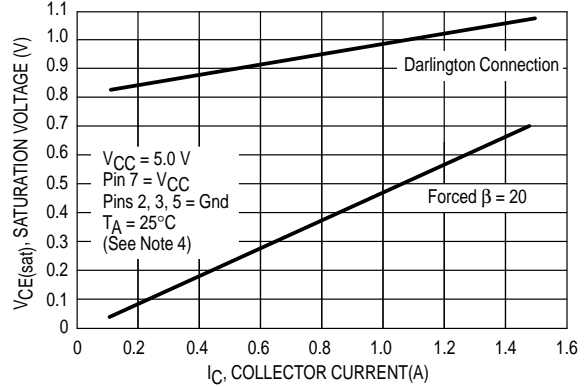
**Figure 2. Timing Capacitor Waveform**



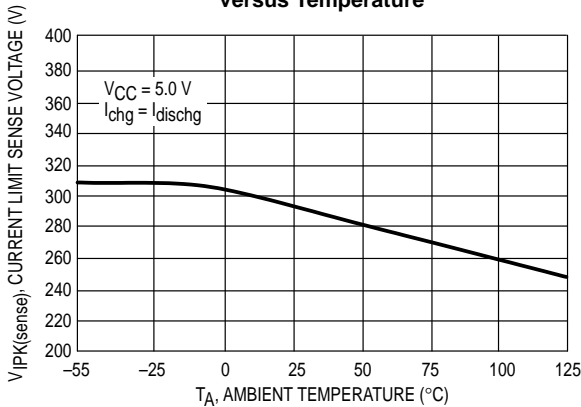
**Figure 3. Emitter Follower Configuration Output Saturation Voltage versus Emitter Current**



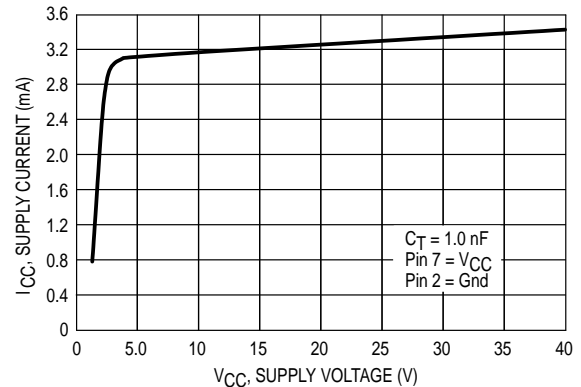
**Figure 4. Common Emitter Configuration Output Switch Saturation Voltage versus Collector Current**



**Figure 5. Current Limit Sense Voltage versus Temperature**



**Figure 6. Standby Supply Current versus Supply Voltage**



### MC34063A

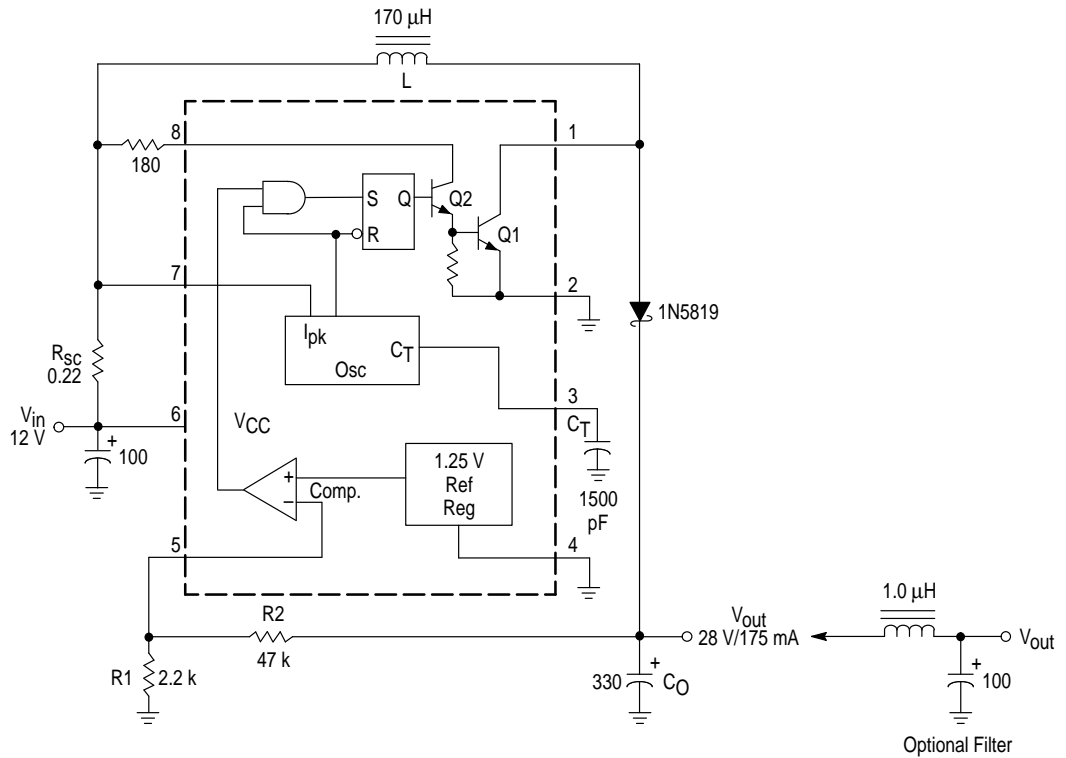


Figure 7. Step-Up Converter

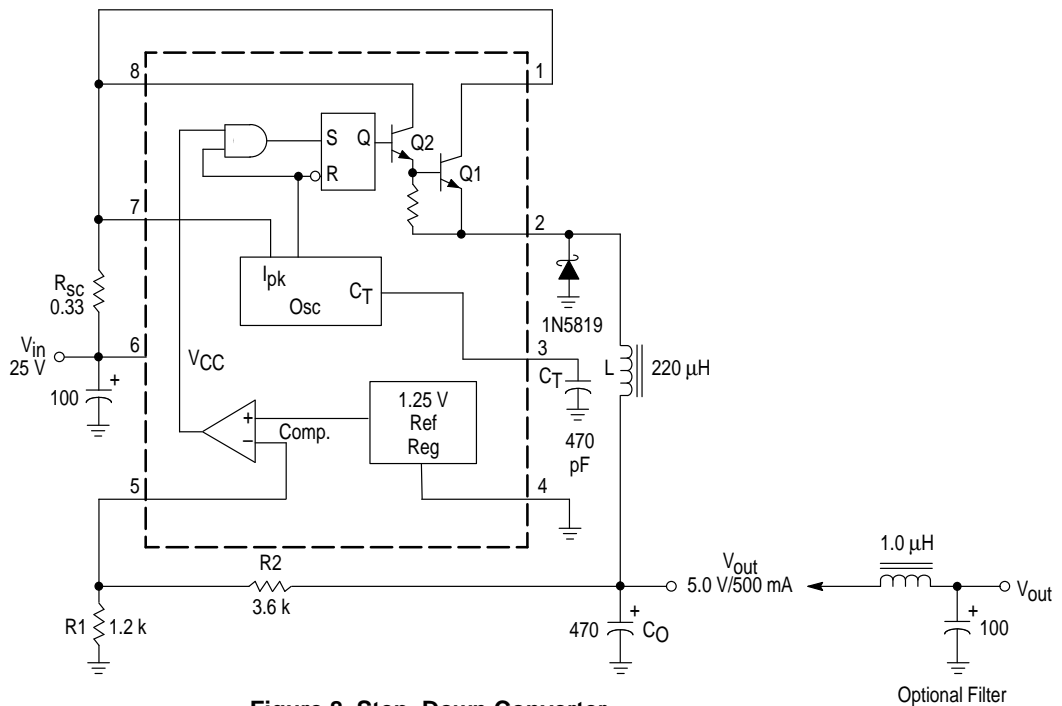


Figure 8. Step-Down Converter

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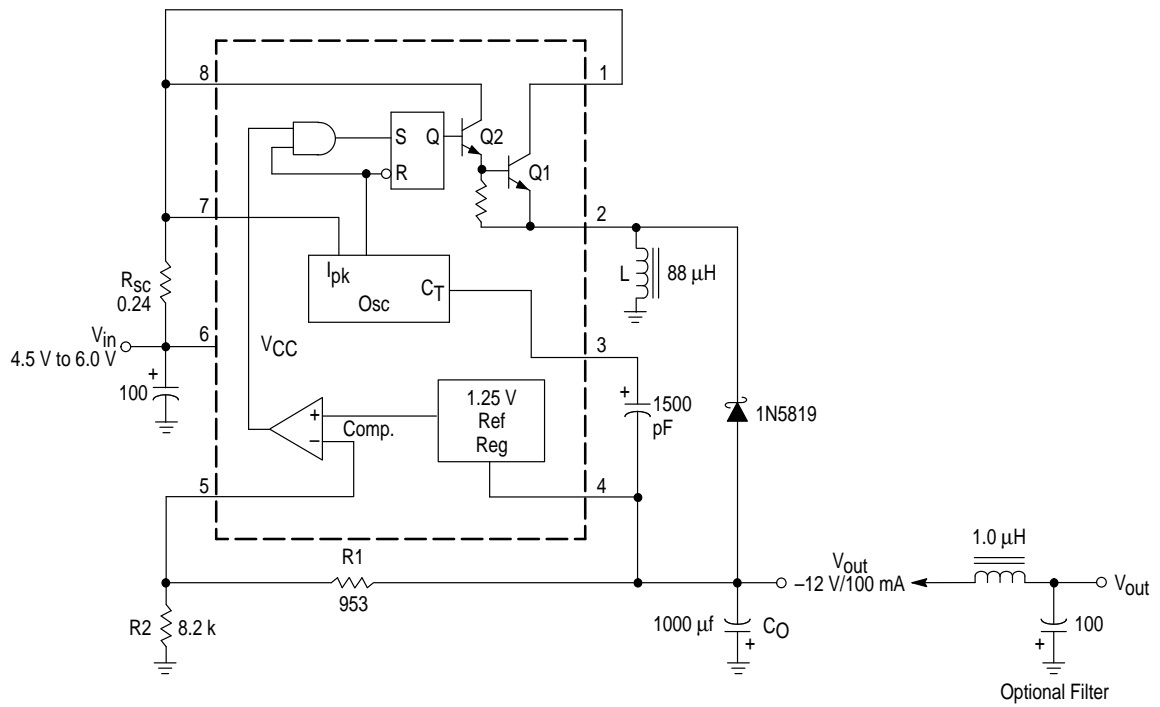


Figure 9. Voltage Inverting Converter