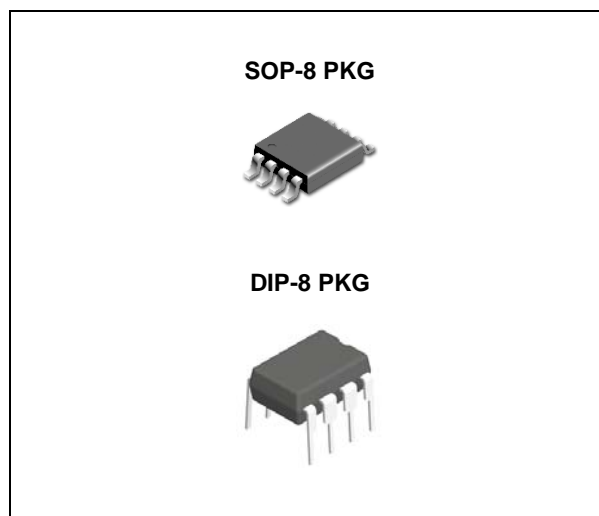


FEATURES

- Operating from 3V to 40V
- Low Standby Current
- Current Limiting
- Output Switch Current to 1.2A
- Output Voltage Adjustable
- Operation Frequency up to 180kHz ($C_T=100\text{pF}$)
- Precision 2% Reference
- Available in SOP-8 and DIP-8 Packages
- Moisture Sensitivity Level 3 for SMD Package

APPLICATION

- Battery Chargers
- NICs / Switches / Hubs
- ADSL Modems
- Negative Voltage Power Supplies

**ORDERING INFORMATION**

Device	Package
MC34063CD	SOP-8
MC34063CN	DIP-8

DESCRIPTION

The 34063C is a monolithic switching regulator control circuit containing the primary functions required for DC-DC converters. This device consists of internal temperature compensated reference, voltage comparator, controlled duty cycle oscillator with active current limit circuit, driver and high current output switch. The device is specifically designed to be used in Step-Down, Step-Up and Voltage-Inverting applications with a minimum number of external components.

The MC34063C is the enhanced version of MC34063A/B with the ability to work in higher frequency.

Absolute Maximum Ratings ^(Note 1)

CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT
Power Supply Voltage	V_{CC}	-	40	V
Comparator Input Voltage Range	V_{IR}	-0.3	40	V
Switch Collector Voltage	V_{SWC}	-	40	V
Switch Emitter Voltage ($V_{SWC}=40\text{V}$)	V_{SWE}	-	40	V
Switch Collector to Emitter Voltage	V_{CE}	-	40	V
Driver Collector Voltage	V_{dc}	-	40	V
Driver Collector Current ^(Note 2)	I_{dc}	-	100	mA
Switch Current	I_{SW}	-	1.2	A

Absolute Maximum Ratings (Continued)

CHARACTERISTIC		SYMBOL	MIN.	MAX.	UNIT
Power Dissipation (at T _A = 25°C)	SOP-8	PD _{MAX_SOP-8}		1.250	W
	DIP-8	PD _{MAX_DIP-8}		0.625	W
Thermal Resistance	SOP-8	θ _{JA-SOP-8}		100	°C/W
	DIP-8	θ _{JA-DIP-8}		160	°C/W
Operating Junction Temperature Range		T _J	-40	150	°C
Storage Temperature Range		T _{STG}	-65	150	°C

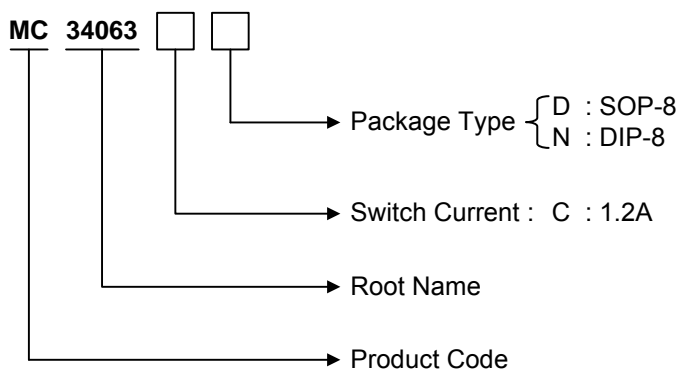
Note 1. Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.

RECOMMENDED OPERATING CONDITIONS

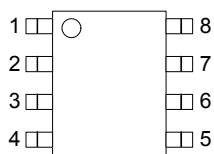
CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT
Supply Voltage	V _{CC}	3	40	V
Operating Ambient Temperature	T _A	-40	85	°C

Ordering Information

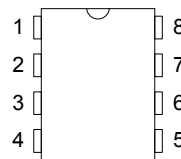
Package	Order No.	Description	Supplied As	Status
SOP-8	MC34063CD	1.2A, 180kHz	Reel	Active
DIP-8	MC34063CN	1.2A, 180kHz	Tube	Active



PIN CONFIGURATION



SOP-8

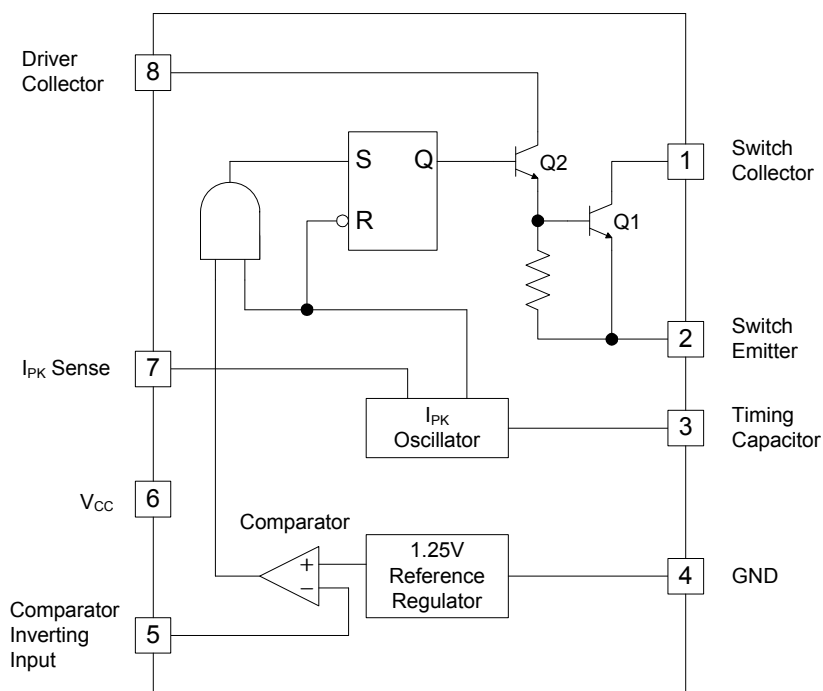


DIP-8

PIN DESCRIPTION

Pin No.	SOP-8 / DIP-8 PKG	
	Name	Function
1	Switch Collector	Internal switch transistor collector
2	Switch Emitter	Internal switch transistor emitter
3	Timing Capacitor	Timing Capacitor to control the switching frequency
4	GND	Ground pin for all internal circuits
5	Comparator Inverting Input	Inverting input pin for internal comparator
6	V _{CC}	Voltage supply
7	I _{PK} Sense	Peak Current Sense Input by monitoring the voltage drop across an external I sense resistor to limit the peak current through the switch
8	Driver Collector	Voltage driver collector

BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS

$V_{CC} = 5V$, $T_A = -40^{\circ}C$ to $85^{\circ}C$, unless otherwise specified.

SYMBOL	PARAMETER	Test Conditions	MIN.	TYP.	MAX.	UNIT
OSCILLATOR						
F_{OSC}	Frequency	$V_{pin5} = 0V$, $C_T = 100pF$, $T_A = 25^{\circ}C$	170	180	190	kHz
I_{CHG}	Charge Current	$V_{CC} = 5$ to $40V$, $T_A = 25^{\circ}C$	30	38	45	μA
I_{DISCHG}	Discharge Current	$V_{CC} = 5$ to $40V$, $T_A = 25^{\circ}C$	180	240	290	μA
I_{DISCHG}/I_{CHG}	Discharge to Charge Current Ratio	Pin 7 = V_{CC} , $T_A = 25^{\circ}C$	5.2	6.5	7.5	
$V_{IPK(SENSE)}$	Current Limit Sense Voltage	$I_{CHG} = I_{DISCHG}$, $T_A = 25^{\circ}C$	250	300	350	mV
Output Switch (Note 3)						
$V_{CE(SAT)}$	Saturation Voltage, Darlington connection	$I_{SW} = 1A$, Pins 1,8 connected		1	1.3	V
$V_{CE(SAT)}$	Saturation Voltage (Note 4)	$I_{SW} = 1A$, $R_{pin8} = 82\Omega$ to V_{CC} , Forced $\beta \sim 20$		0.45	0.8	V
h_{FE}	DC Current Gain	$I_{SW} = 1A$, $V_{CE} = 5V$, $T_A = 25^{\circ}C$	50	75		
$I_{C(OFF)}$	Collector Off-state Current	$V_{CE} = 40V$		0.01	100	μA
Comparator						
V_{TH}	Threshold Voltage	$T_A = 25^{\circ}C$	1.225	1.25	1.275	V
		$T_A = T_{LOW}$ to T_{HIGH}	1.21		1.29	V
REG_{Line}	Threshold Voltage Line Regulation	$V_{CC} = 3$ to $40V$		1.4	5	mV
I_{IB}	Input Bias Current	$V_{IN} = 0V$		-20	-400	nA
TOTAL DEVICE						
I_{CC}	Supply Current	$V_{CC} = 5$ to $40V$, $C_T = 1nF$, Pin7 = V_{CC} . $V_{pin5} > V_{TH}$, Pin2 = GND, Other pins open	-	-	4	mA

Note 1. Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Note 2. Maximum package power dissipation limits must be observed.

Note 3. Low duty cycle pulse technique are used during test to maintain junction temperature as close to ambient temperature as possible.

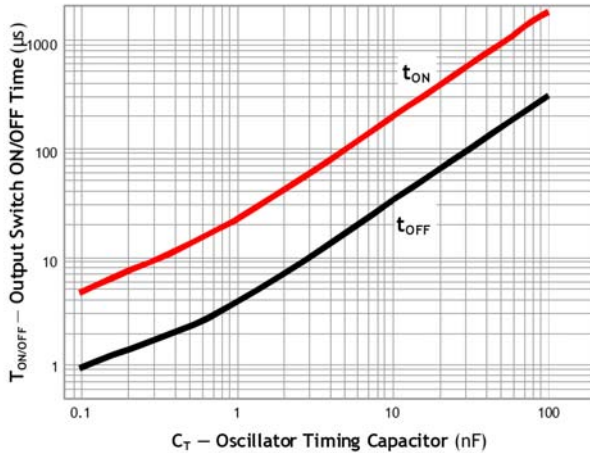
Note 4. If the output switch is driven into hard saturation (non-Darlington configuration) at low switch currents ($\leq 300mA$) and high driver currents ($\geq 30mA$), it may take up to 2.0 μs for it to come out of saturation. This condition will shorten the off time at frequencies 30 kHz, and is magnified at high temperatures. This condition does not occur with a Darlington configuration, since the output switch cannot saturate. If a non-Darlington configuration is used, the following output drive condition is recommended:

$$\text{Forced } \beta \text{ of output switch : } \frac{I_{C(OUTPUT)}}{I_{C(DRIVER)} - 7.0mA} \geq 10$$

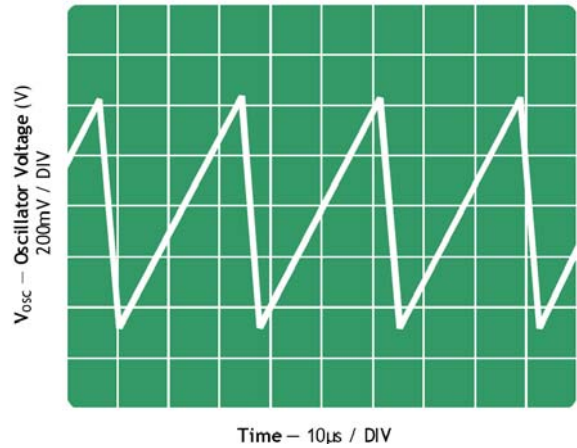
* The 100 Ω resistor in the emitter of the driver device requires about 7 mA before the output switch conducts.

TYPICAL OPERATING CHARACTERISTICS

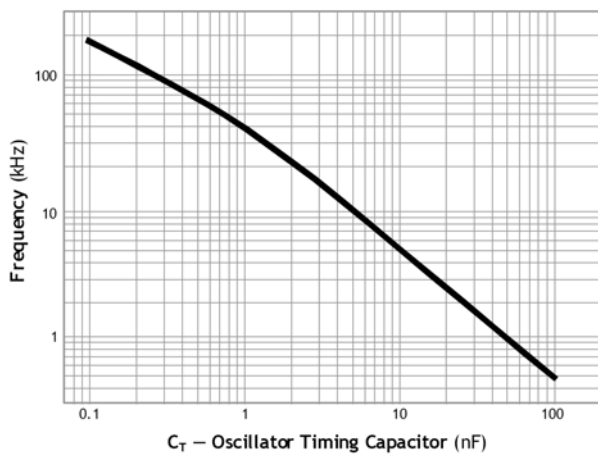
OUTPUT SWITCH ON-OFF TIME vs. OSCILLATOR TIMING CAPACITOR



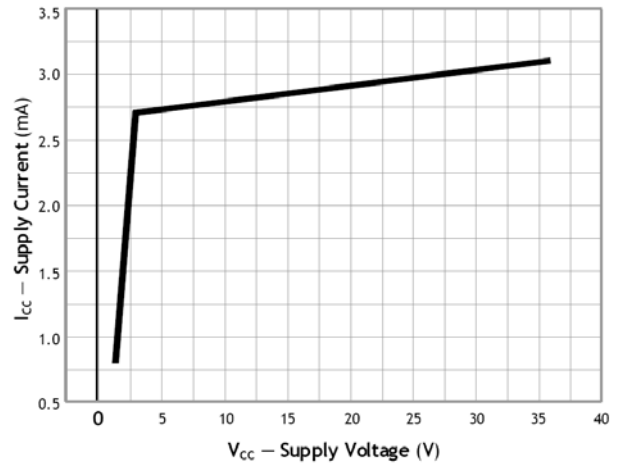
TIMING CAPACITOR WAVEFORM



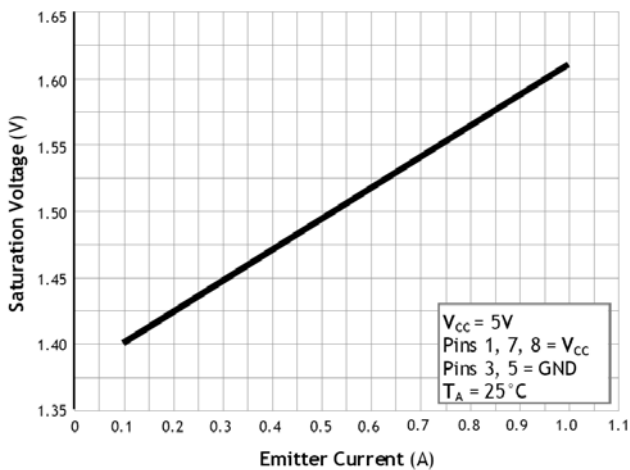
OSCILLATOR FREQUENCY vs. TIMING CAPACITOR



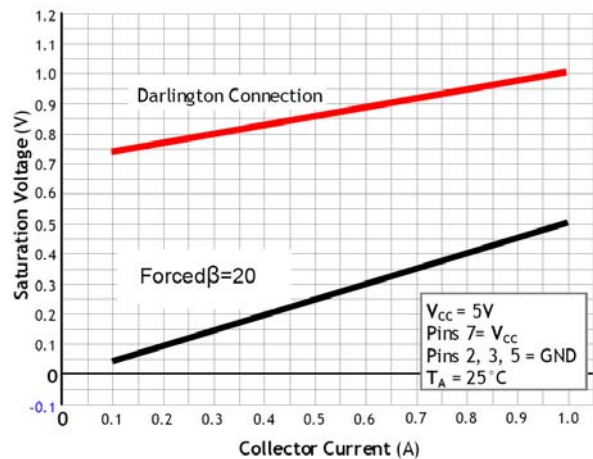
STANDBY SUPPLY CURRENT vs. SUPPLY VOLTAGE



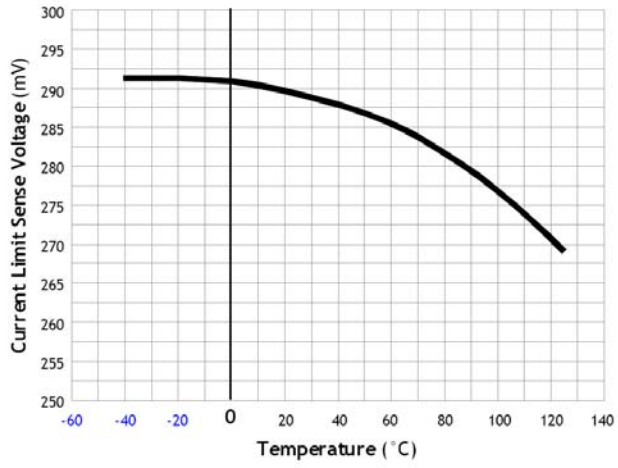
EMITTER FOLLOWER CONFIGURATION OUTPUT SATURATION VOLTAGE vs. EMITTER CURRENT



COMMON EMITTER CONFIGURATION OUTPUT SWITCH SATURATION VOLTAGE vs. COLLECTOR CURRENT

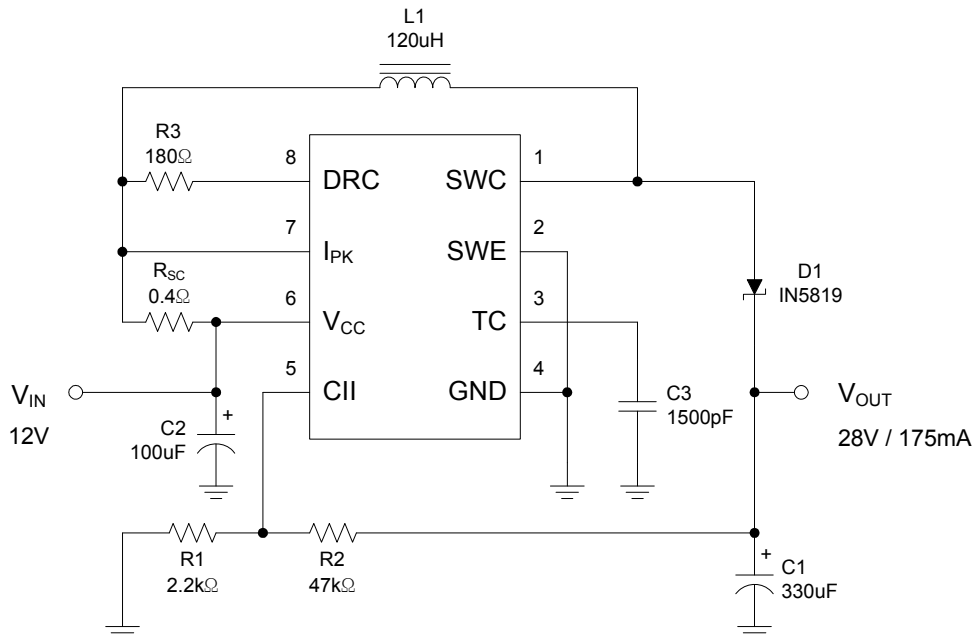


CURRENT LIMIT SENSE VOLTAGE
vs. TEMPERATURE

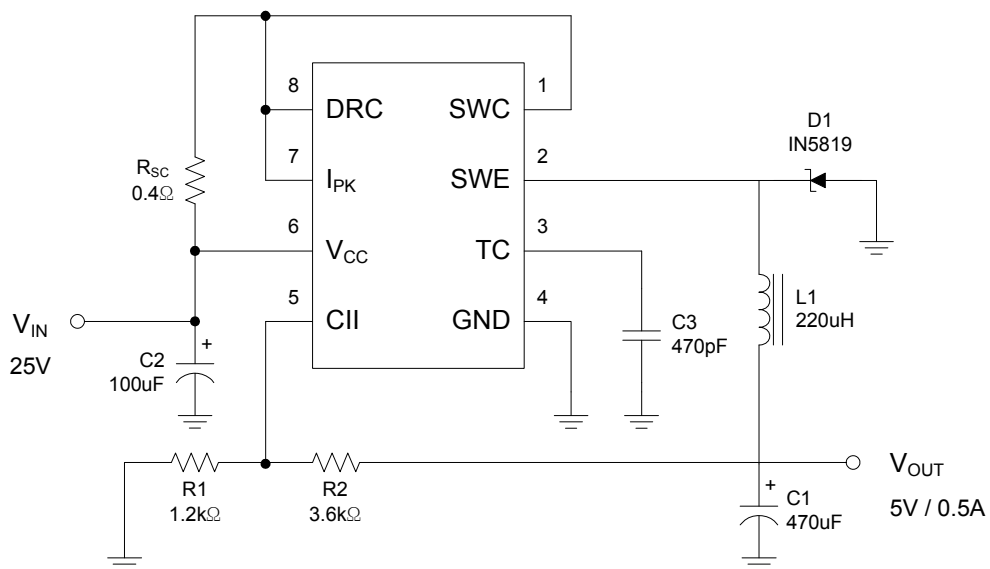


TYPICAL APPLICATION

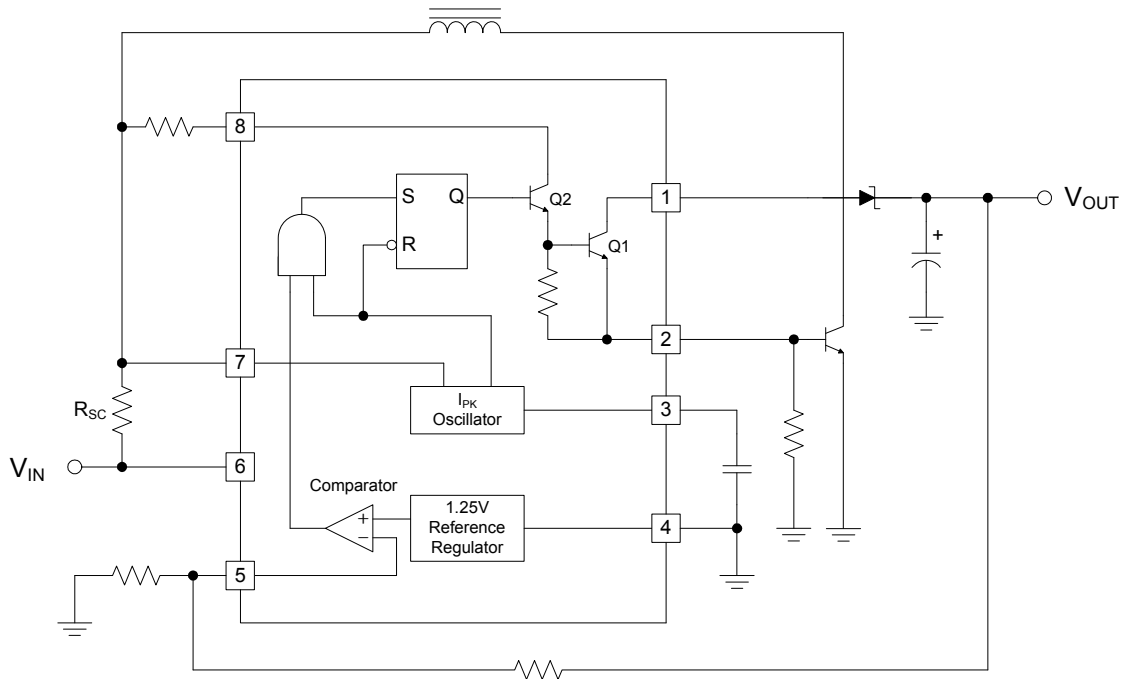
Step-Up Converter



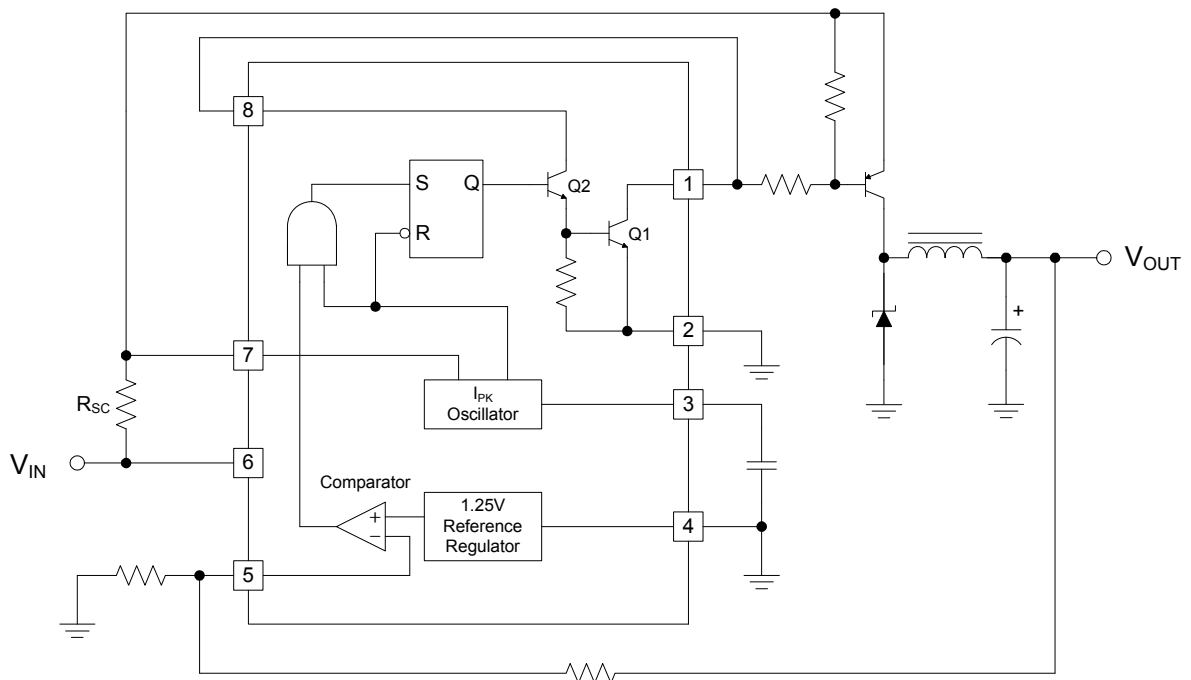
Step-Down Converter



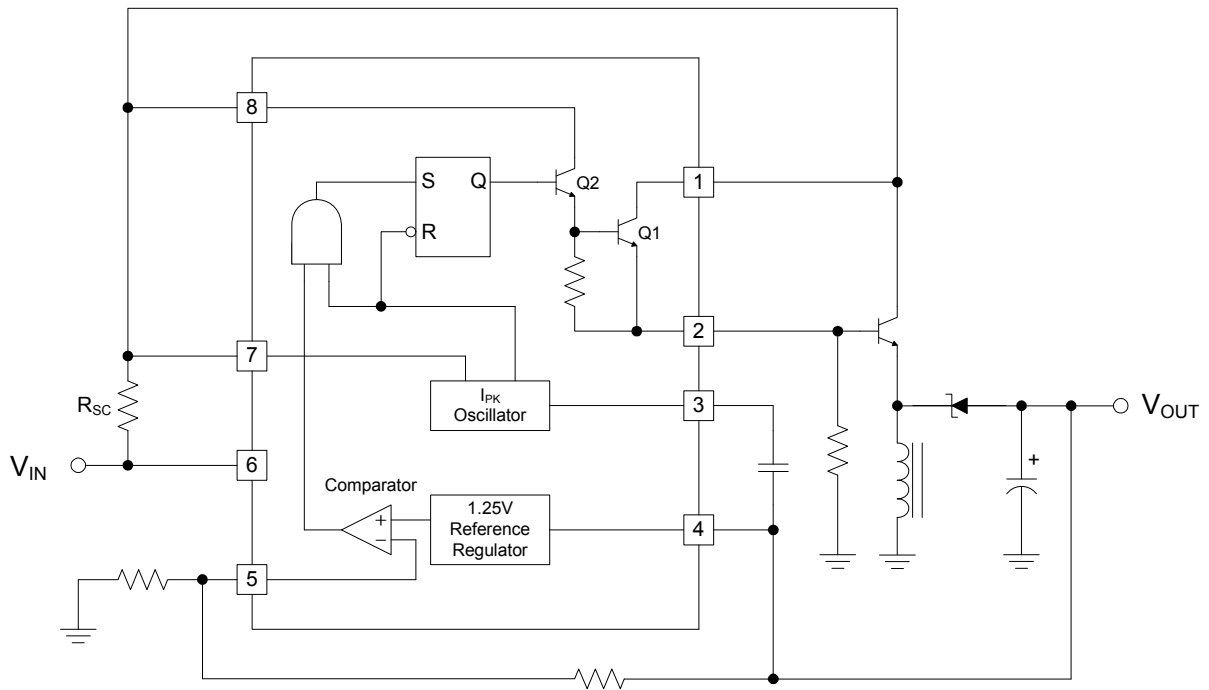
Step-Up with External NPN Switch



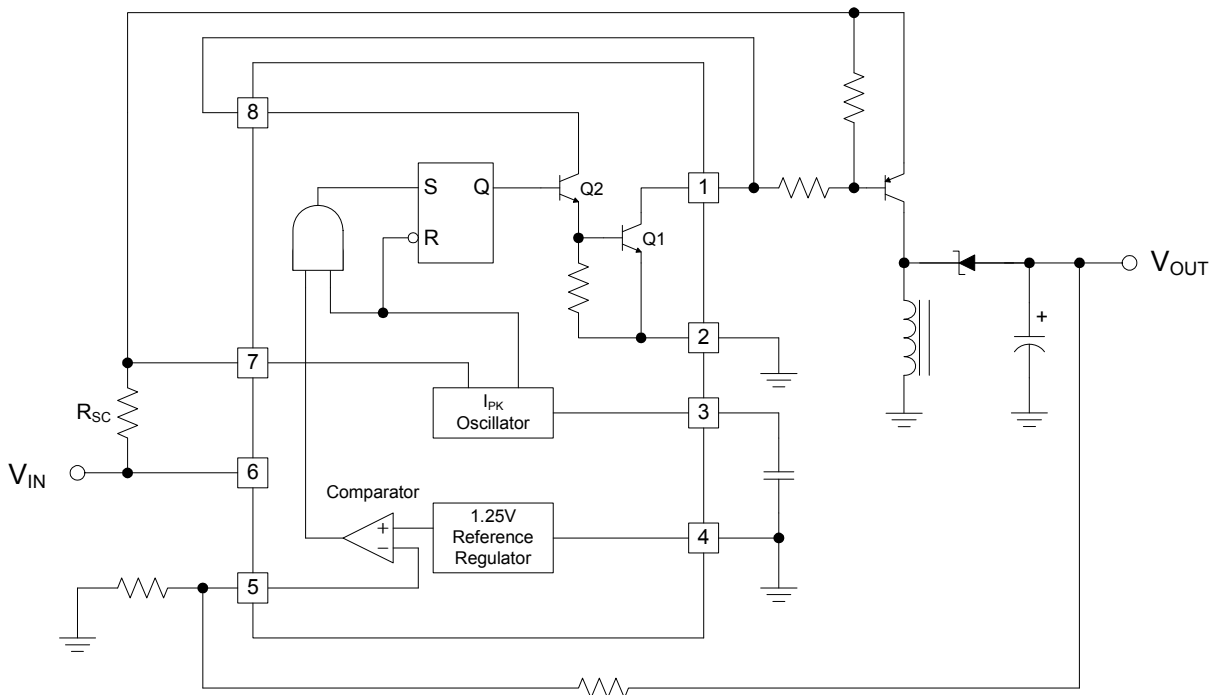
Step-Down with External PNP Switch



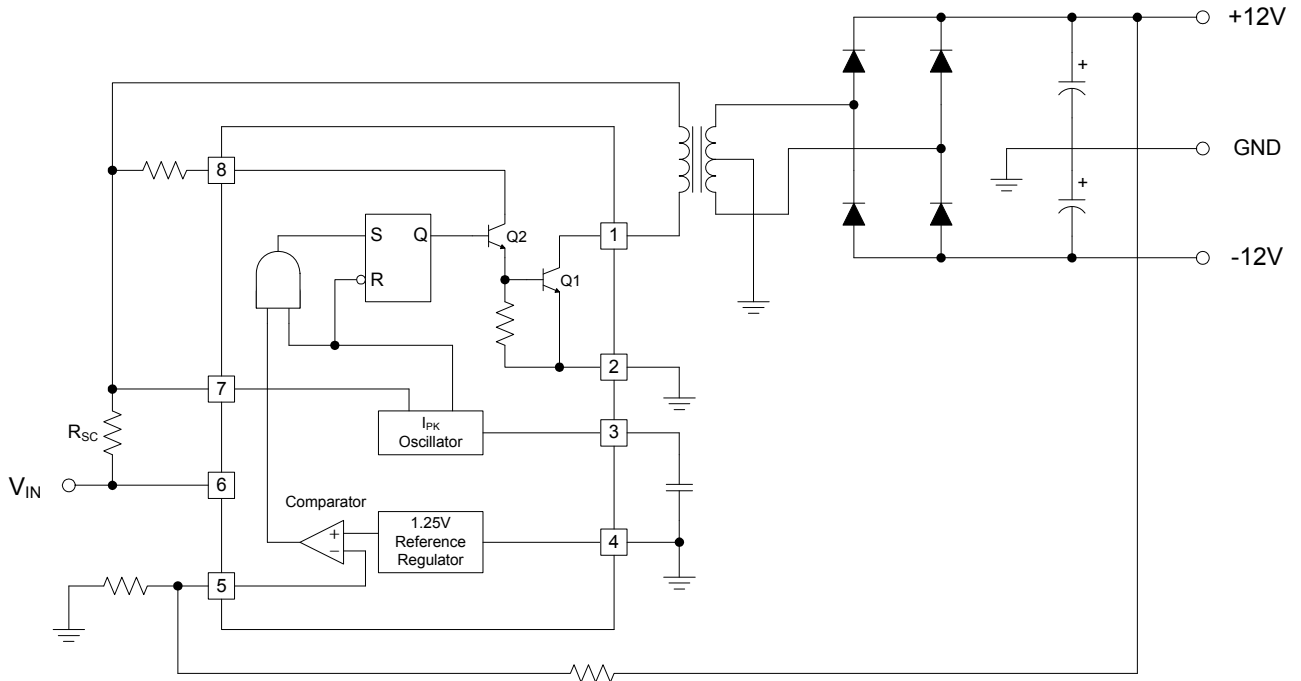
Voltage Inverting with External NPN Switch



Voltage Inverting with External PNP Saturated Switch



Dual Output Voltage



Higher Output Power, Higher Input Voltage

