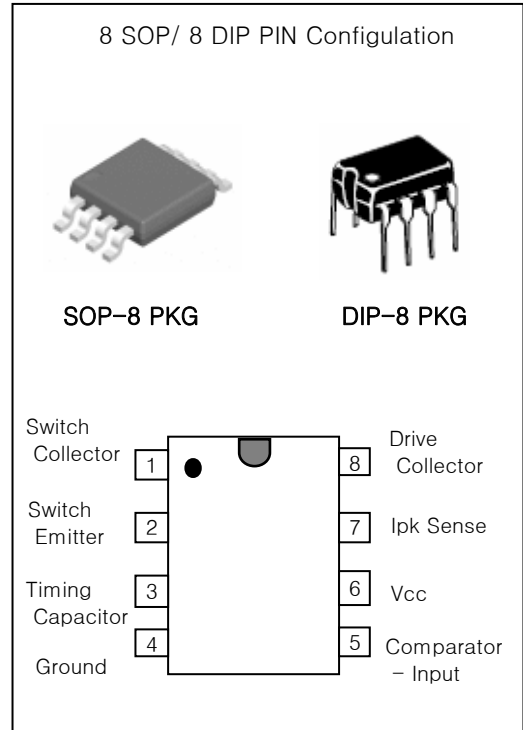


**FEATURES**

- OPERATING FROM 3V TO 40V
- Low Standby Current
- Current Limiting
- Output Switch Current to 0.8A
- Output Voltage Adjustable
- Operation Frequency up to 180KHz (CT=100pF)
- Precision 2% Reference

**Application**

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



**ORDERING INFORMATION**

Device	Package
MC34063CD	8 SOP
MC34063CN	8 DIP

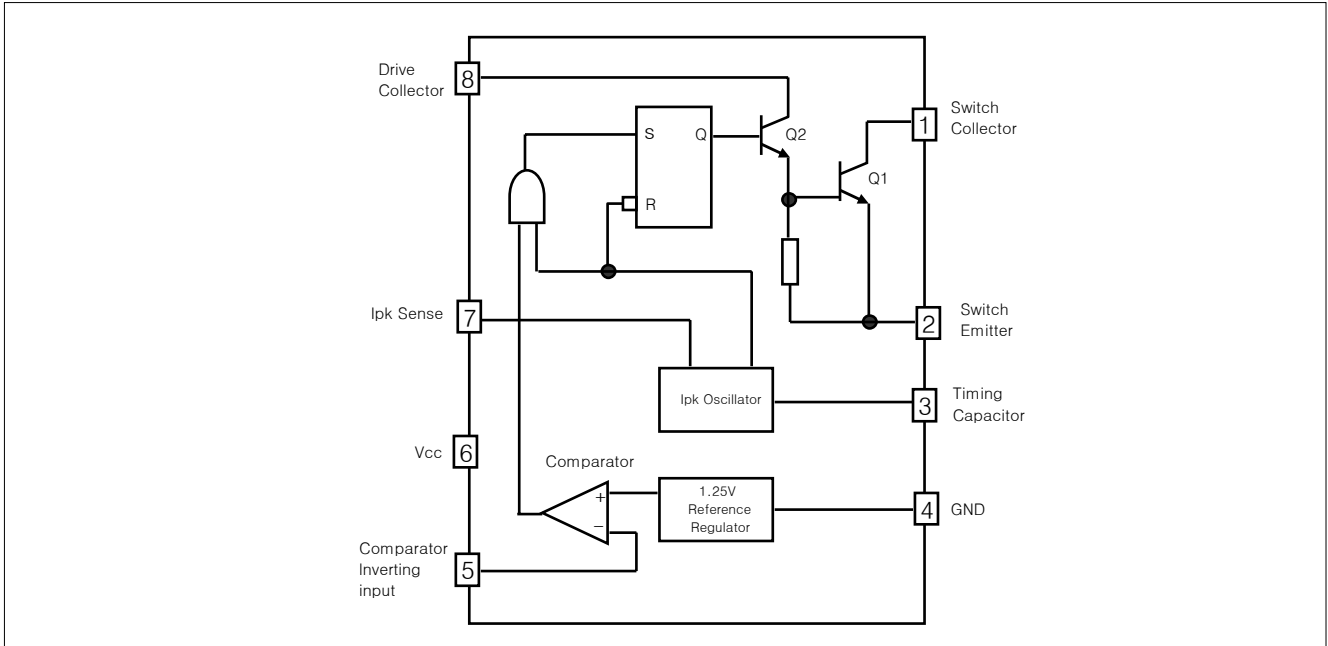
**DESCRIPTION**

The MC34063C is a monolithic switching regulator control circuit containing the primary function required for DC-DC converters.

This device consists of internal temperature compensated reference, voltage comparator, coti duty cycle oscillator with active current. The device is specifically designed to be used in Step-Step-Up and Voltage-Inverting applications with a minimum number of external components.

The MC34063C is the enhanced version of MC34063A with the ability to work in higher frequency. The MC34063C is available in 2 packages : SOP-8 and DIP-8.

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (NOTE 1)

SYMBOL	PARAMETER		VALUE	UNIT
$V_{CC}$	Power Supply Voltage		40	V
$V_{IR}$	Comparator input Voltage Range		-0.3 to 40	V
$V_{SWC}$	Switch Collector Voltage		40	V
$V_{SWE}$	Switch Emitter Voltage (VSWC=40V)		40	V
$V_{CE}$	Switch Collector to Emitter Voltage		40	V
$V_{dc}$	Driver Collector Voltage		40	V
$I_{dc}$	Driver Collector Current (NOTE 2)		100	mA
$I_{sw}$	Switch Current		0.8	A
PD	SOP Package	Power Dissipation at $T_{amb}=25^{\circ}C$	1.25	W
$P_{\theta JA}$		Thermal Resistance	100	$^{\circ}C/W$
PD	DIP Package	Power Dissipation at $T_{amb}=25^{\circ}C$	0.625	W
$P_{\theta JA}$		Thermal Resistance	160	$^{\circ}C/W$
$T_J$	Operating Junction Temperature Range		-40 to 150	$^{\circ}C$
$T_{stg}$	Storage Temperature Range		-65 to +150	$^{\circ}C$

Absolute Maximum Rating are those values beyond which damage to the device may occur.

Functional operation under these condition is not implied.

## 0.8A Step Down / Step Up / Inverting DC-DC Converter

## MC34063C

ELECTRICAL CHARACTERISTICS( Refer to the test circuits,  $V_{CC}=5V$ ,  $T_a = -40^{\circ}C$  to  $85^{\circ}C$

### OSCILLATOR

SYMBOL	PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
$F_{OSC}$	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	$\mu A$
$I_{dischg}$	Discharge Current	$V_{CC} = 5$ to $40V, T_a = 25^{\circ}C$	180	240	290	$\mu A$
$I_{dischg}/I_{chg}$	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)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{CE(sat)}$	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	$\mu A$

### COMPARATOR

SYMBOL	PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{th}$	Threshold Voltage	$T_a = 25^{\circ}C$ $T_a = T_{LOW}$ to $T_{HIGH}$	1.225 1.21	1.25	1.275 1.29	V 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

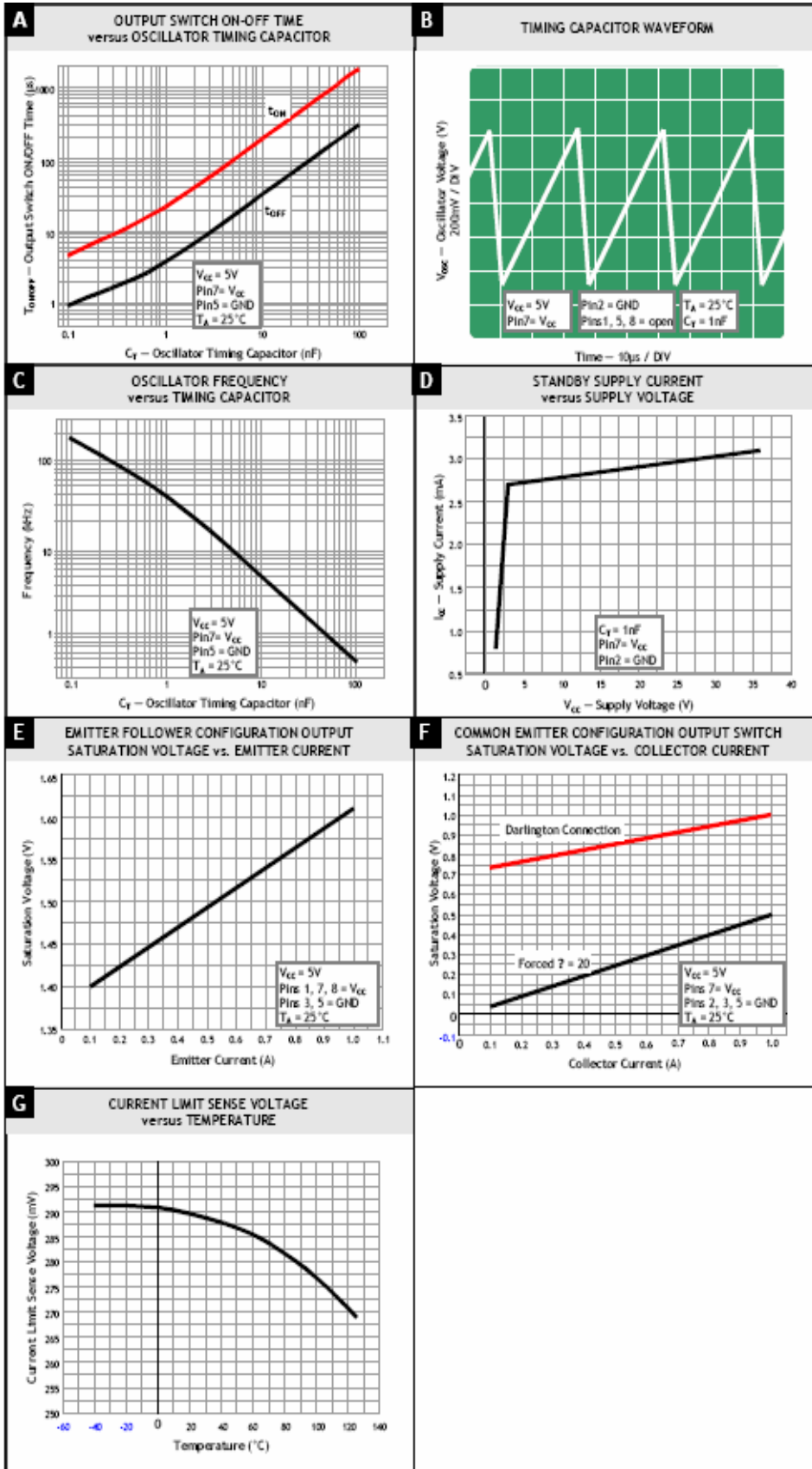
### TOTAL DEVICE

SYMBOL	PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CC}$	Supply Current	$V_{CC} = 5$ to $40V, C_T = 1nF$ Pin7 = $V_{CC}, V_{pin5} > V_{th}, Pin2 = GND$ Remaining pins open for MC34063C		2.5	4	mA

Notes:

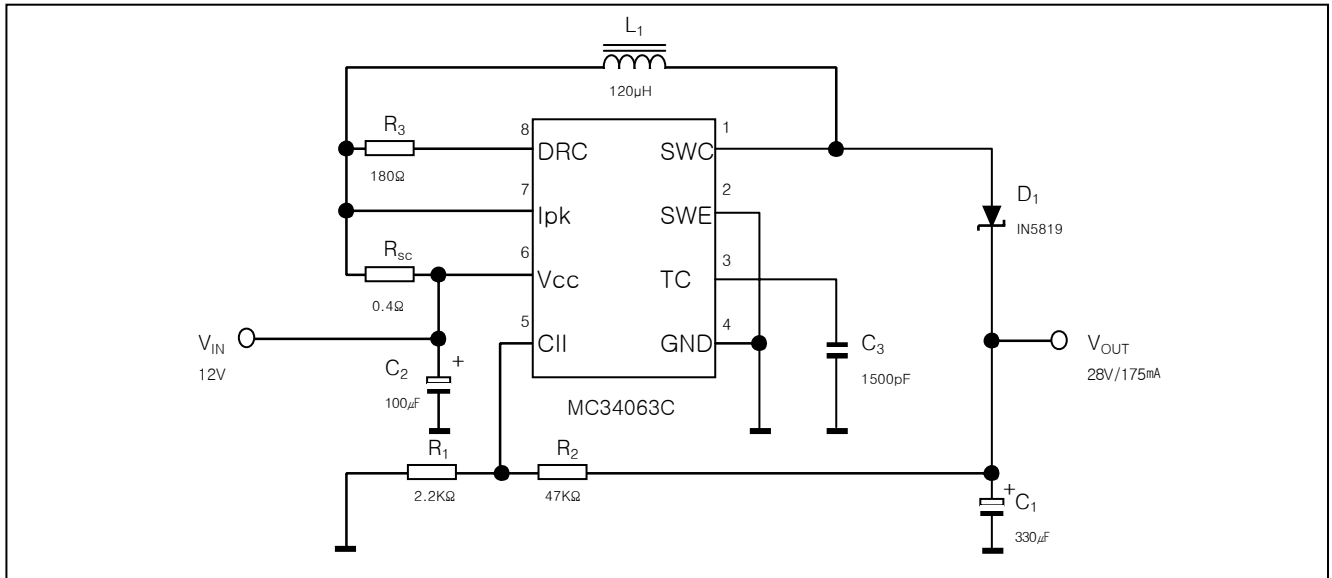
- 1 Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.
- 2 Maximum package power dissipation limits must be observed.
- 3 Low duty cycle pulse technique are used during test to maintain junction temperature as close to ambient temperature as possible.
- 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  $2.0\mu s$  for it to come out of saturation. This condition will shorten the off time at frequencies 30kHz, and is magnified at high temperatures. This condition does not occur with a Darlington configuration, since the output switch cannot saturate.

TYPICAL PERFORMANCE CHARACTERISTICS

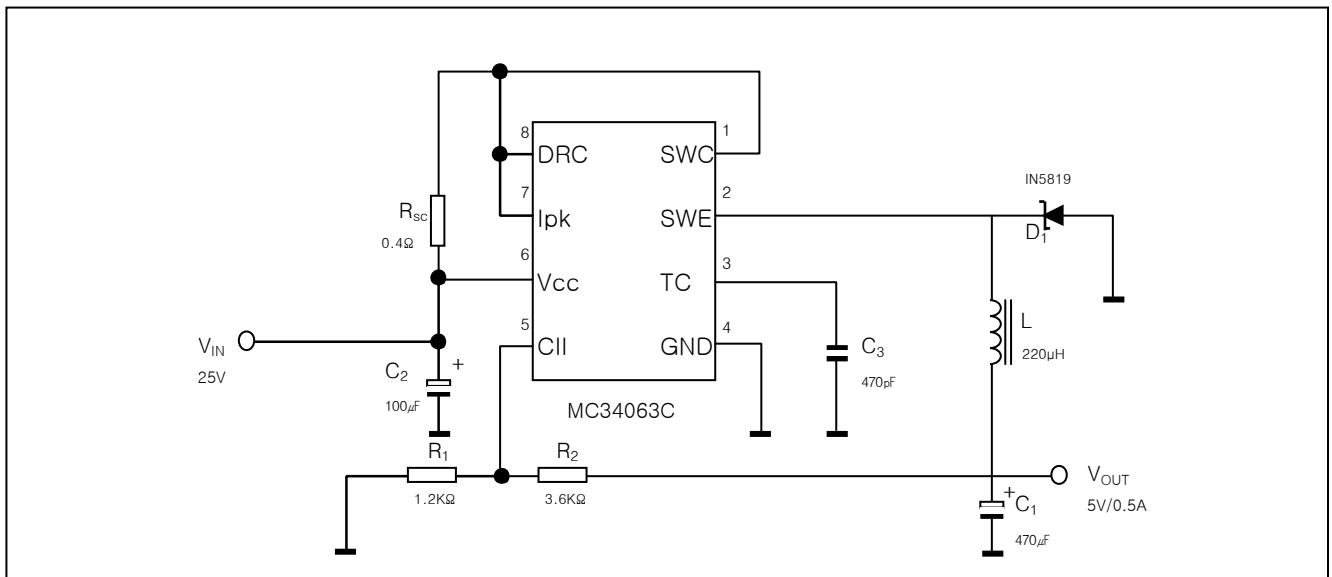


TYPICAL APPLICATION CIRCUIT

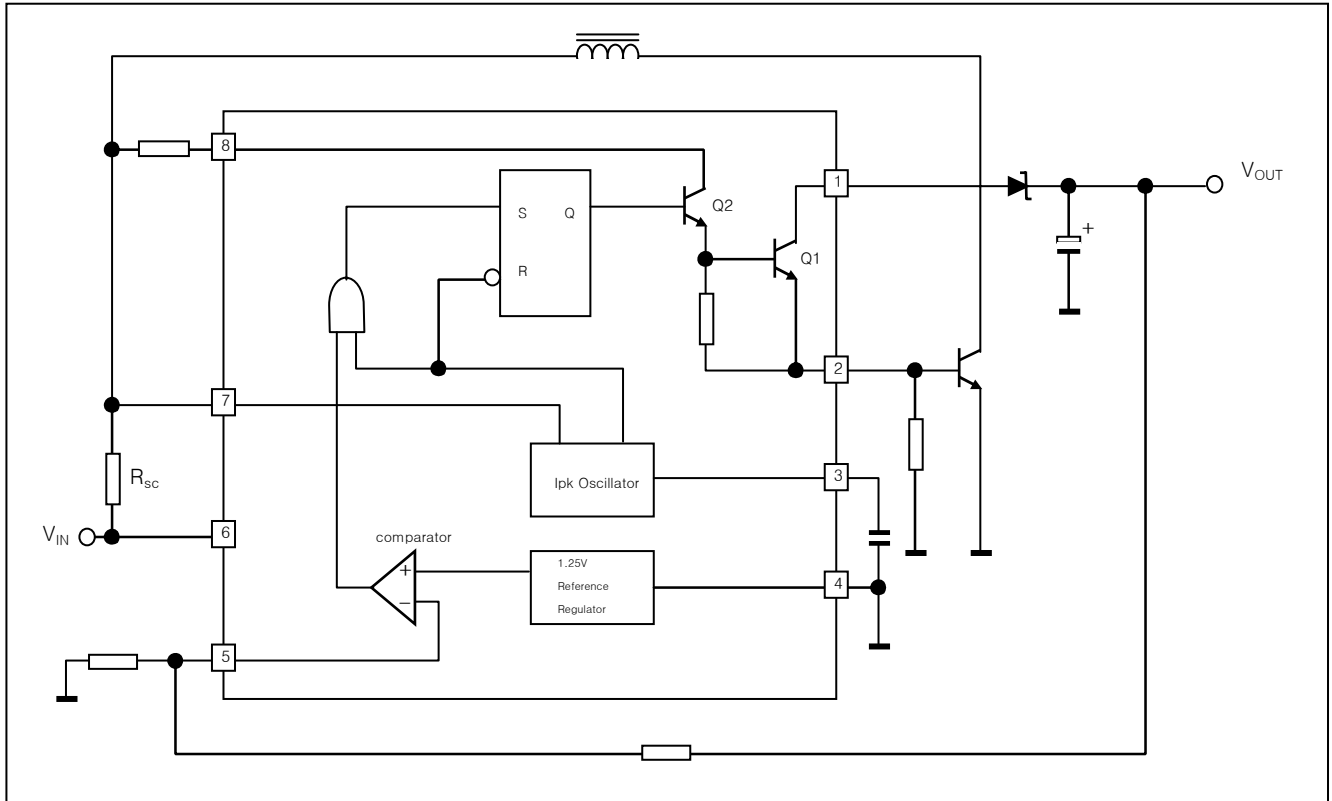
Step-Up Converter



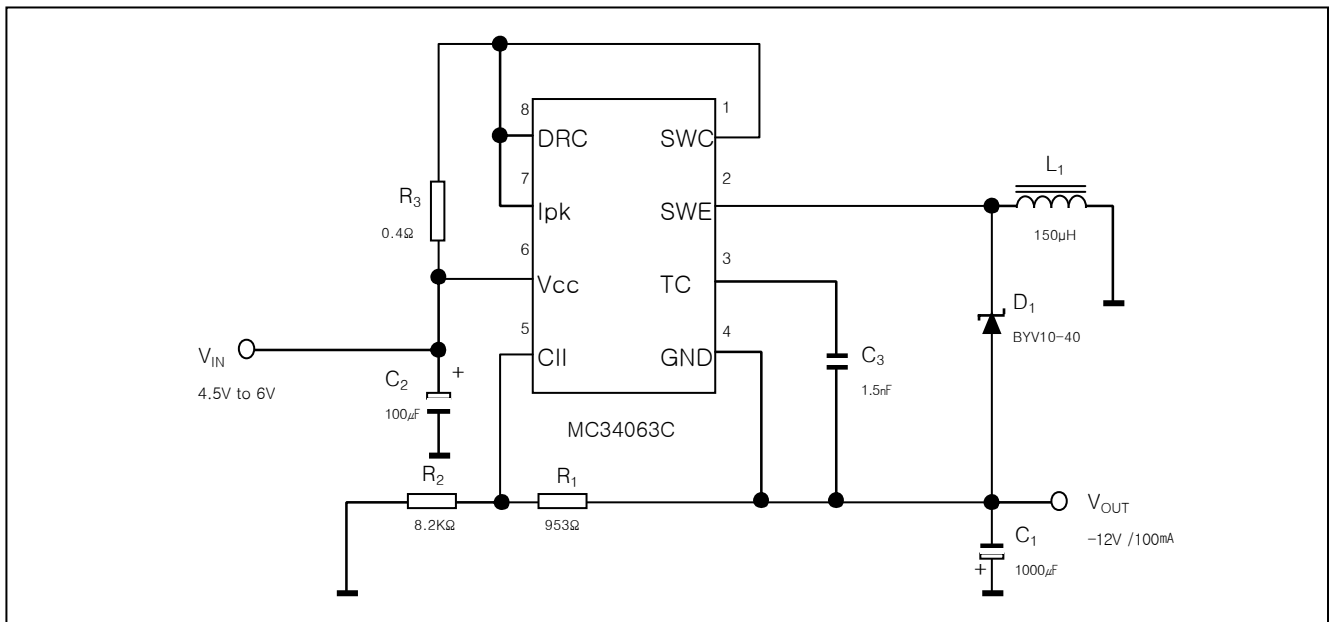
Step-Down Converter



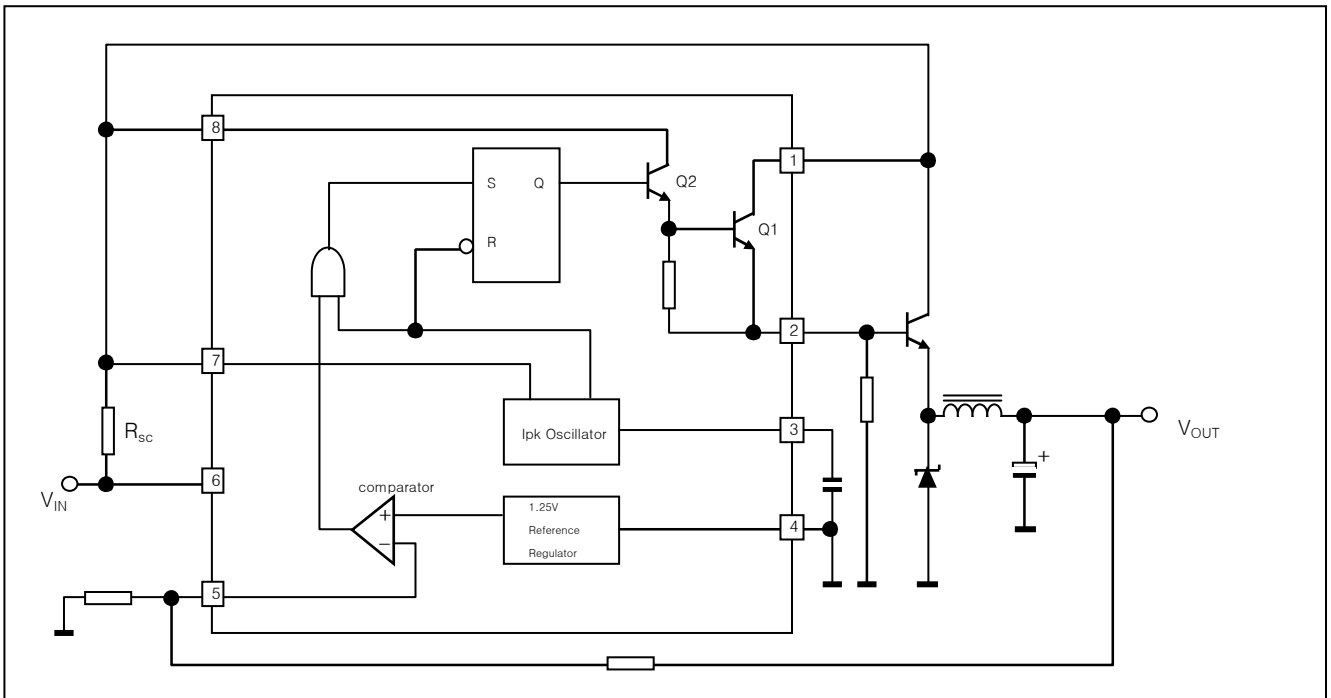
Step-Up With External NPN Switch



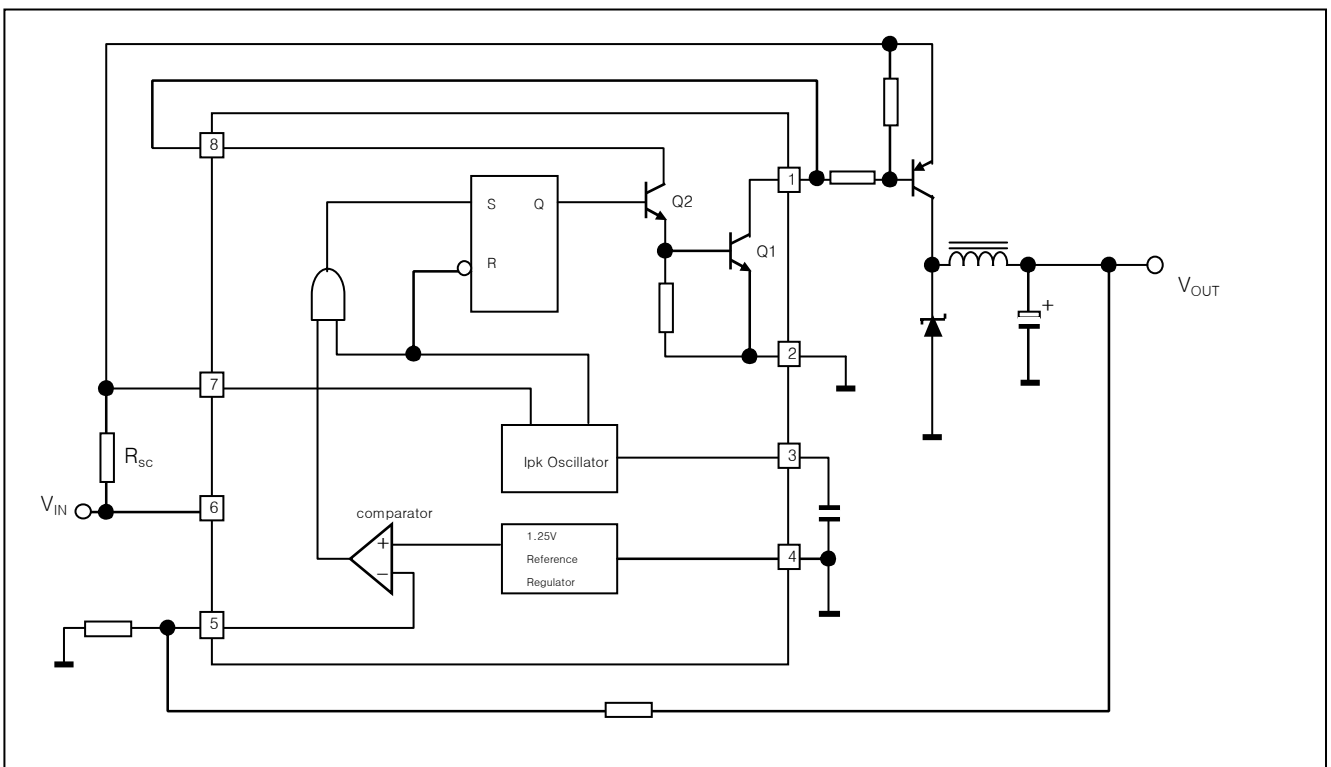
Voltage Inverting Converter



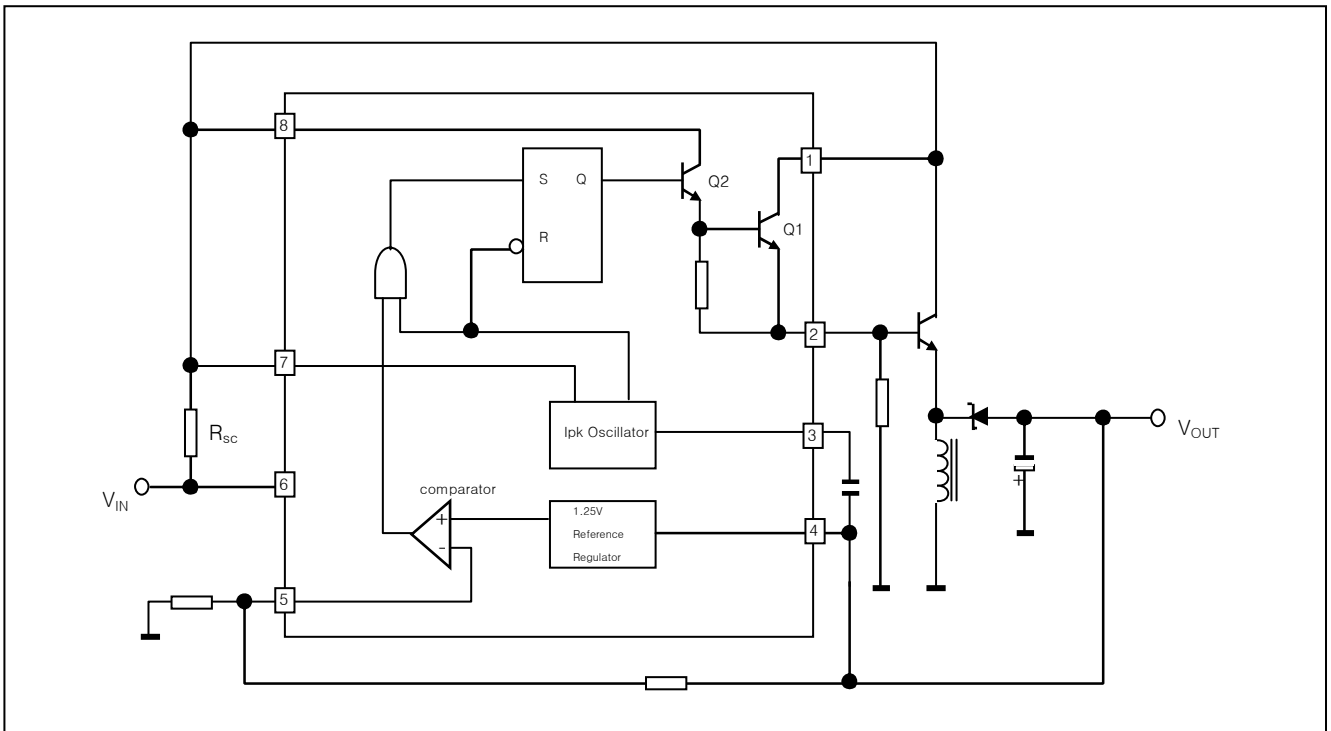
Step-Down With External NPN Switch



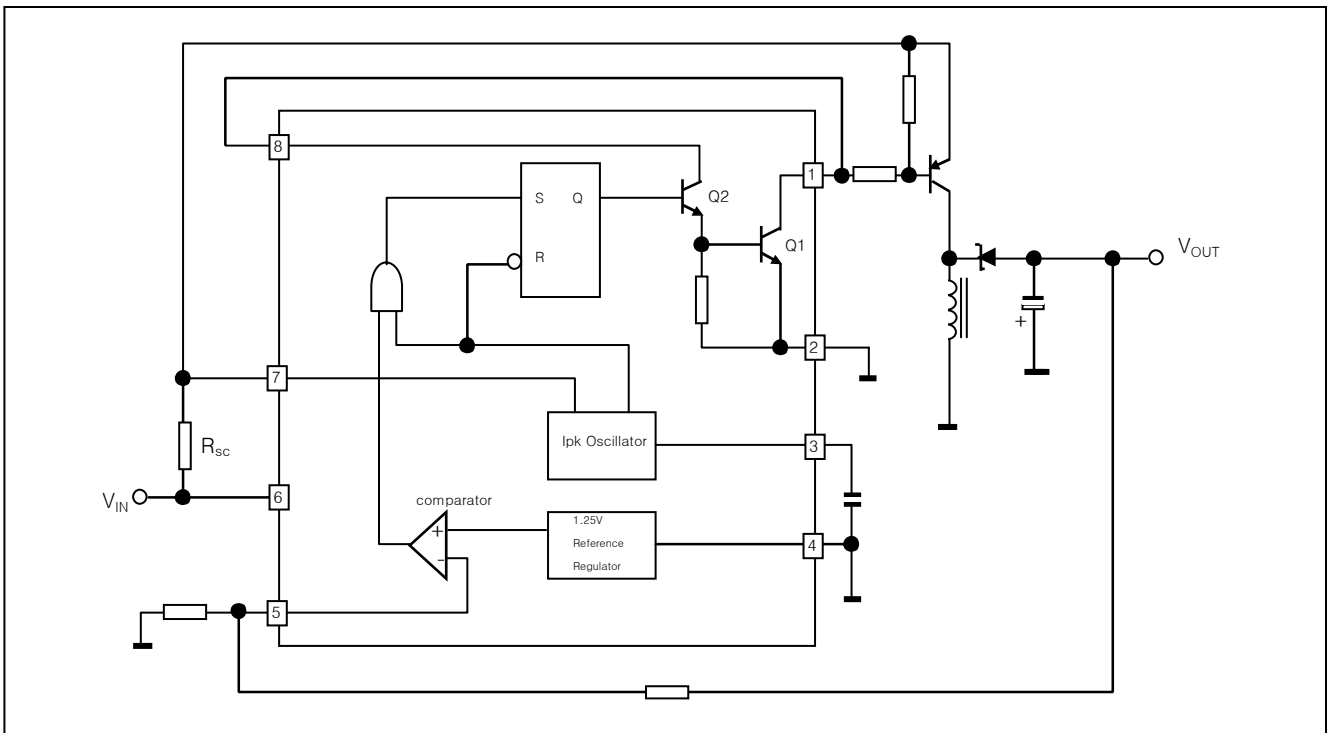
Step-Down With External PNP Switch



Voltage Inverting With External NPN Switch

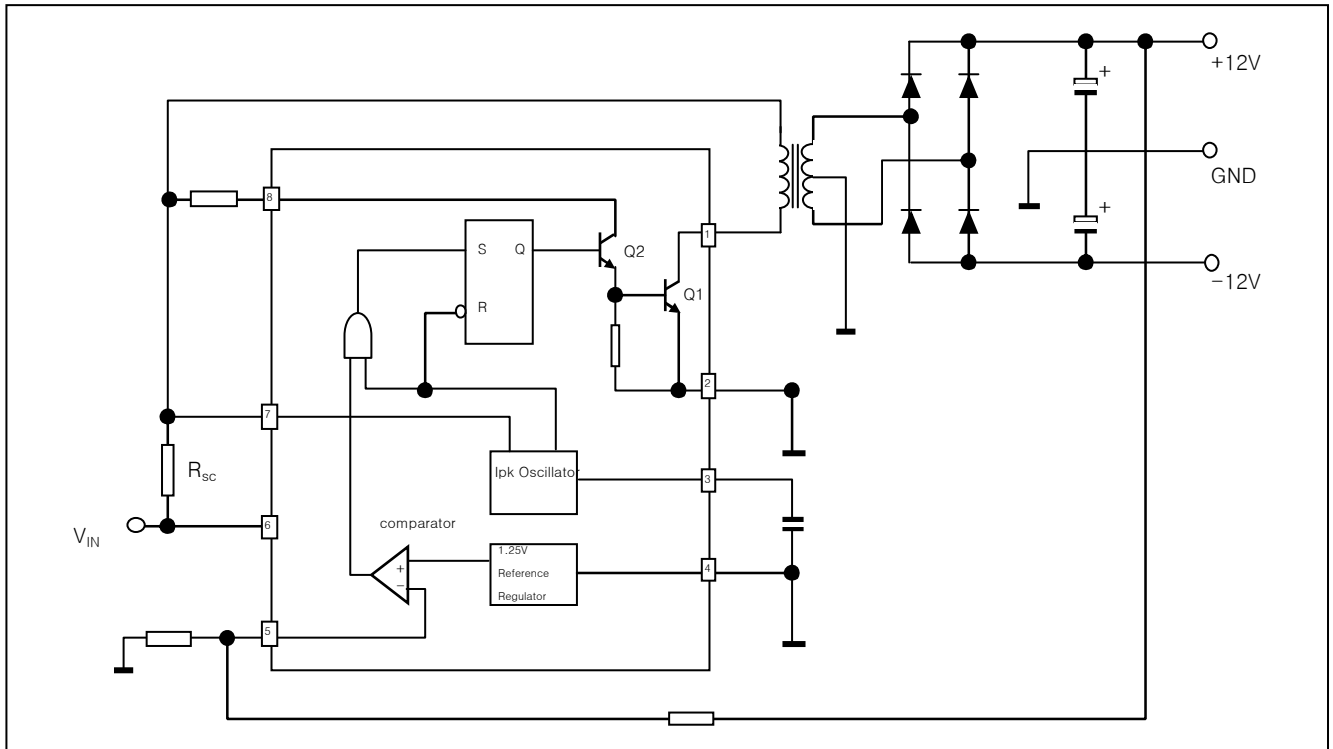


Voltage Inverting With External PNP Saturated Switch





Dual Output Voltage



Higher Output Power, Higher Input Voltage

