

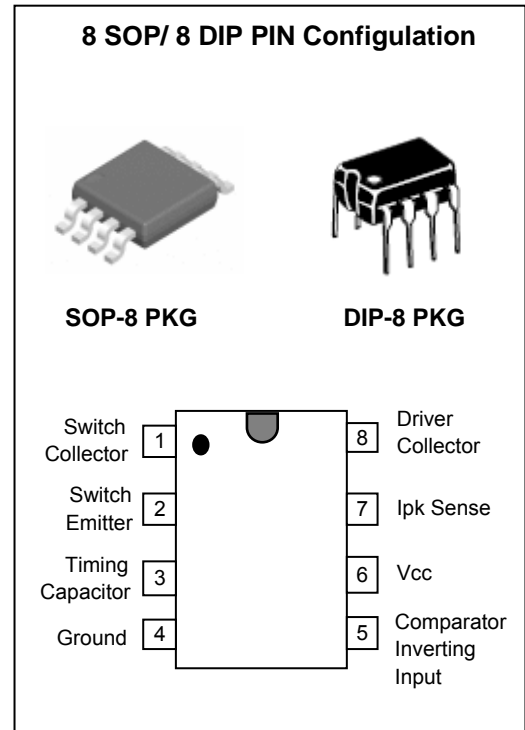
0.8A Step Down / Step Up / Inverting DC-DC Converter **MC34063C**

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
- Moisture Sensitivity Level 3

Application

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



ORDERING INFORMATION

Device	Package
MC34063CD	SOP-8
MC34063CN	DIP-8

DESCRIPTION

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

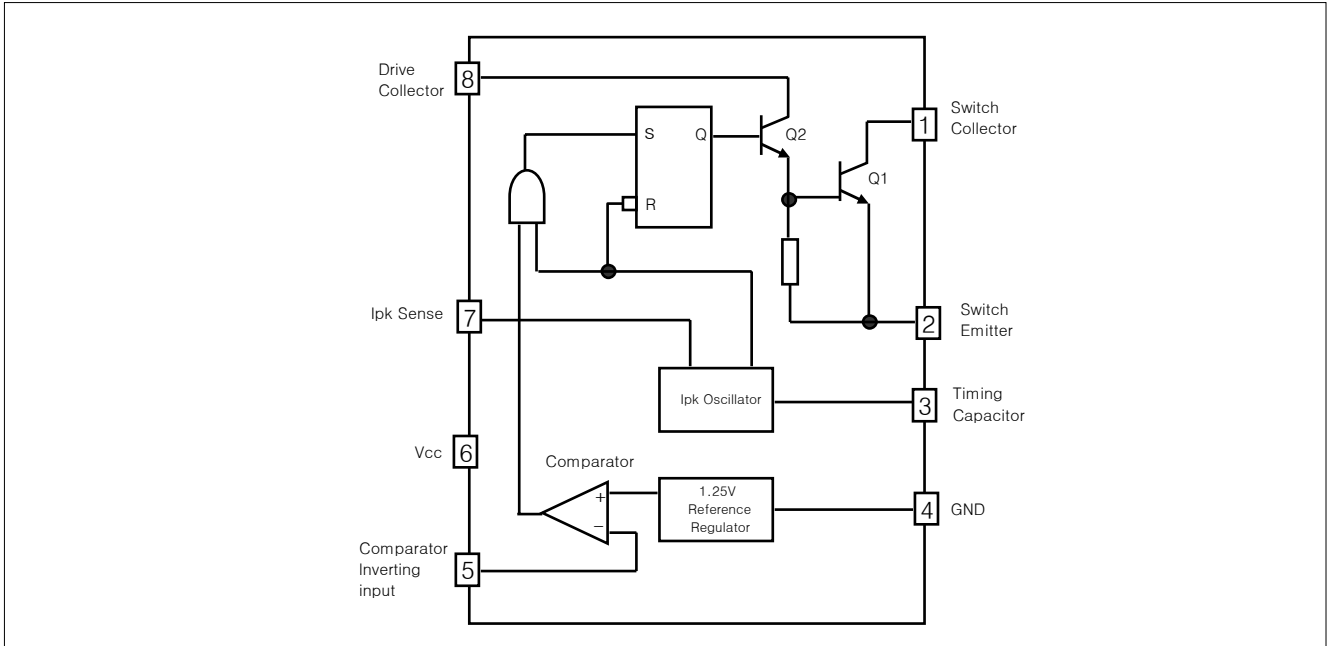
This device consists of internal temperature compensated reference, voltage comparator, controlled duty cycle duty cycle oscillator with active current. The device is specifically designed to be used in Step-Down, Step-Up and Voltage-Inverting applications with a minimum number of external components.

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

The 34063C is available in 2 packages : SOP-8 and DIP-8.

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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 ($V_{SWC}=40V$)		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.

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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	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)

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	μA

COMPARATOR

SYMBOL	PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
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

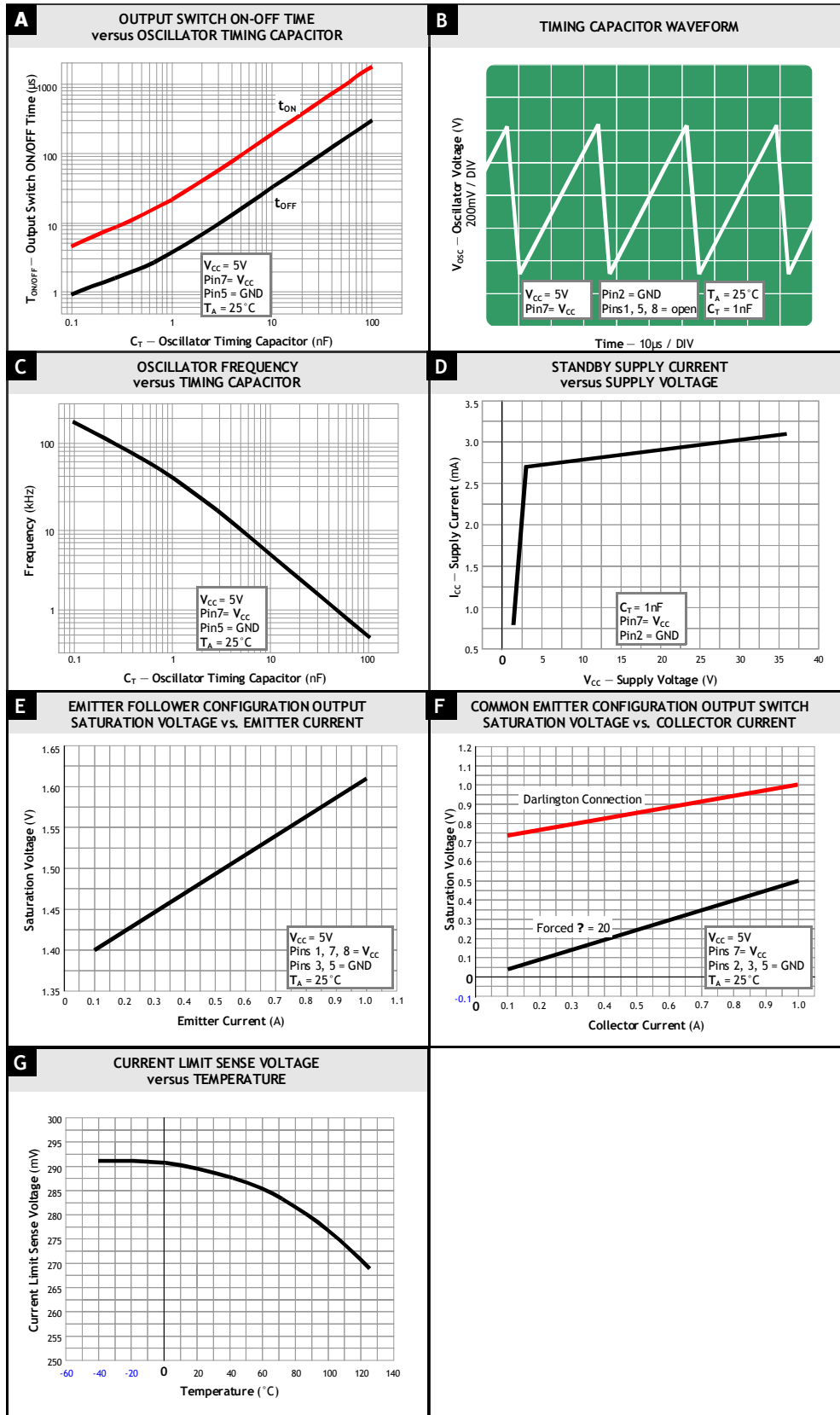
SYMBOL	PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CC}	Supply Current	$V_{CC} = 5$ to $40V, C_T = 1nF$ Pin7 = $V_{CC}, V_{pin5} > V_{th}, Pin2 = GND$ Remaining pins open for MC34063C		2.5	4	mA

Notes:

- Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress retings 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.
- Maximum package power dissipation limits must be observed.
- Low duty cycle pulse technique are used during test to maintain junction temperature as close to ambient temperature as possible.
- If the output switch is driven into hard saturation (non-Darlington configuration) at low switch currents ($\leq 800mA$) 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.

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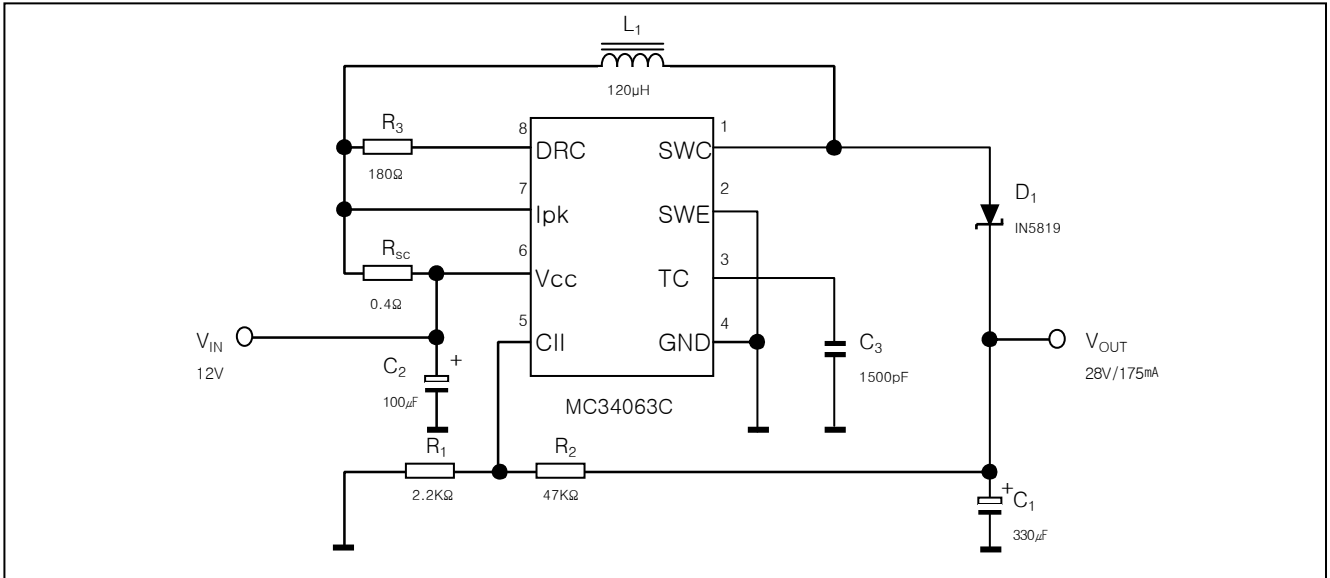
TYPICAL PERFORMANCE CHARACTERISTICS



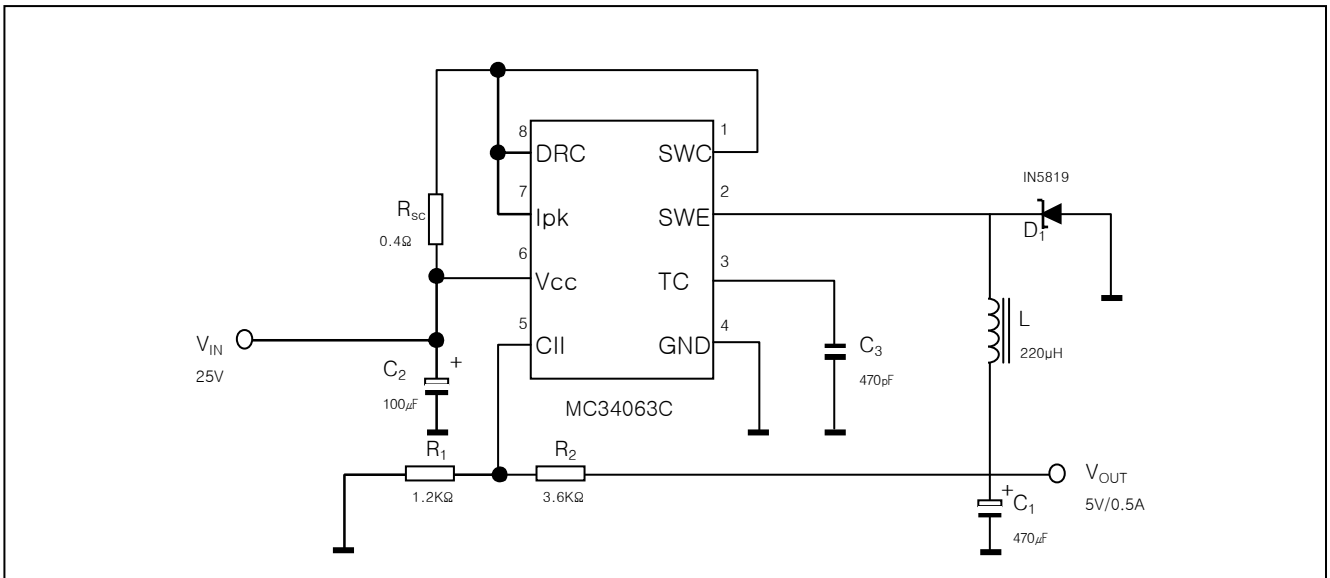
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TYPICAL APPLICATION CIRCUIT

Step-Up Converter

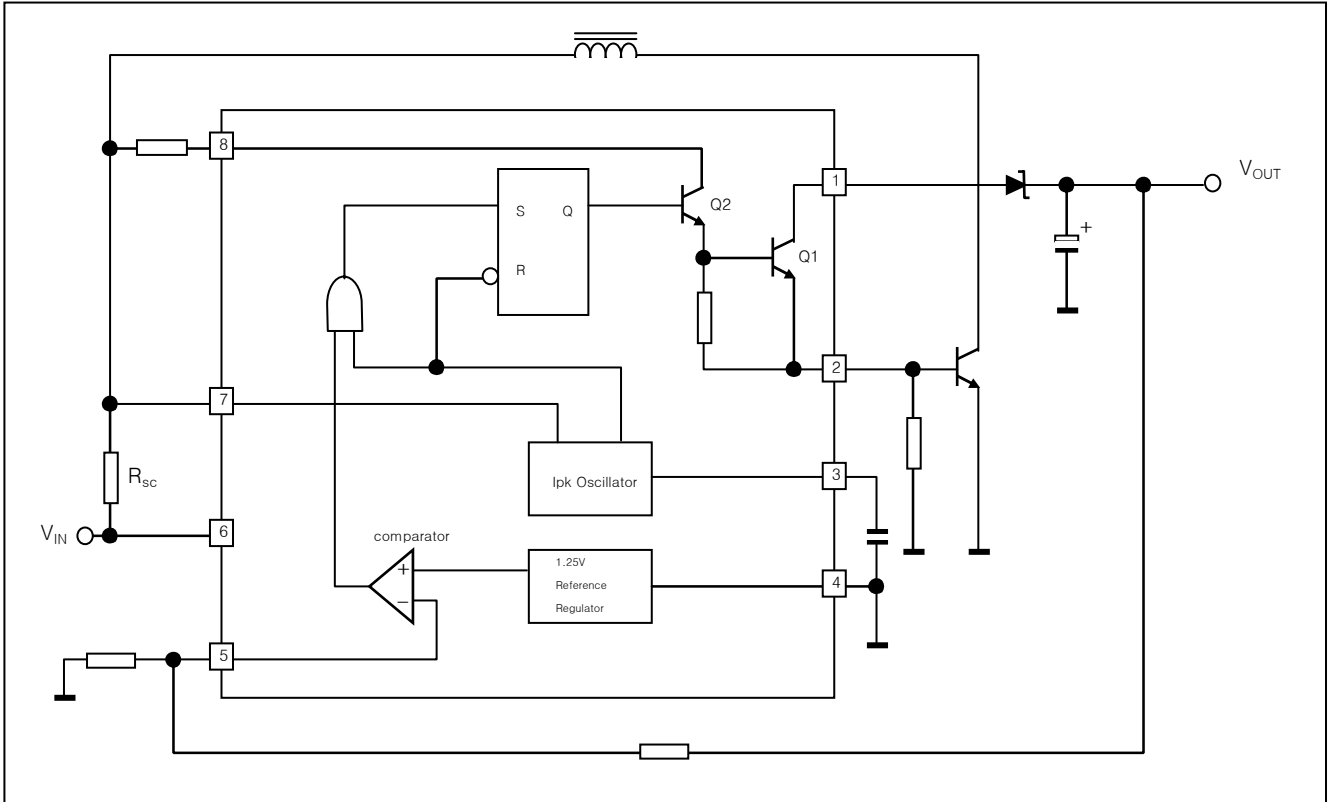


Step-Down Converter

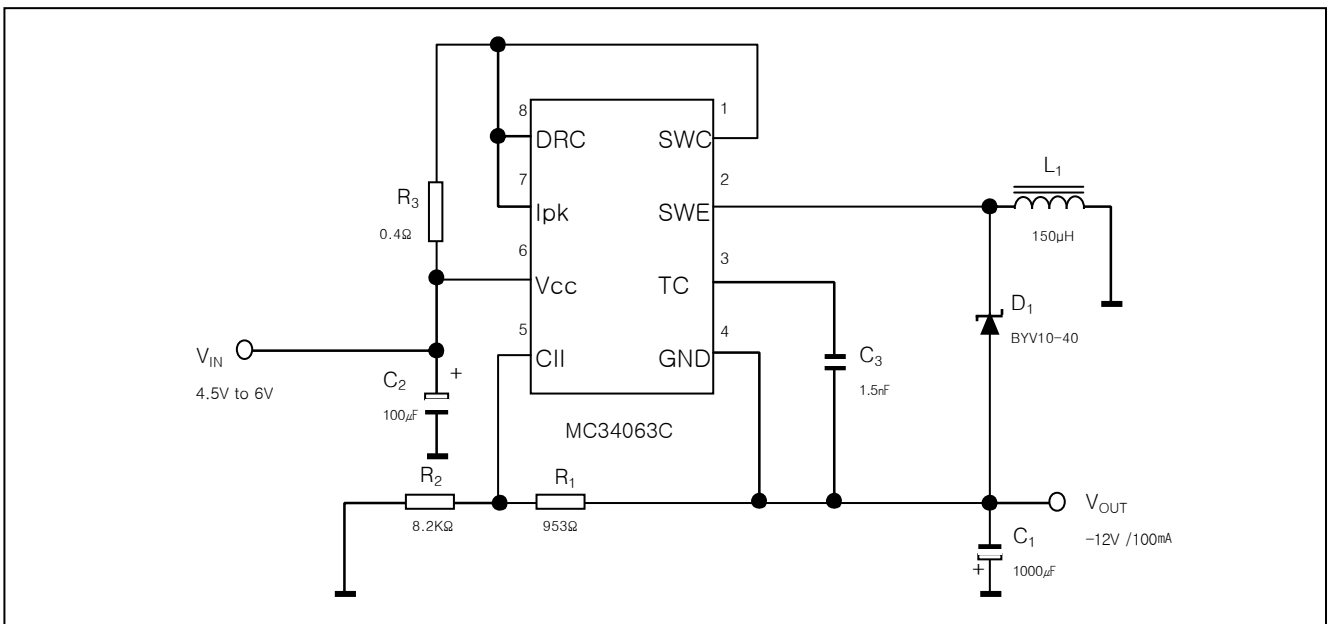


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Step-Up With External NPN Switch

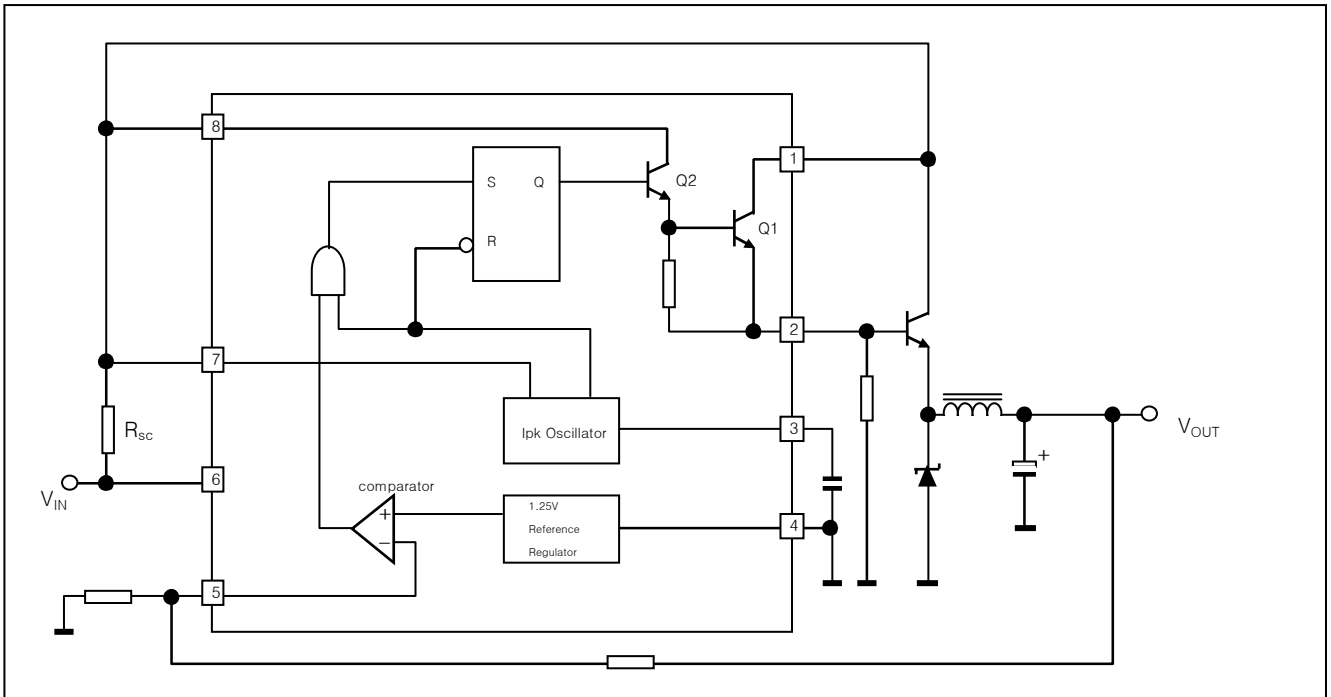


Voltage Inverting Converter

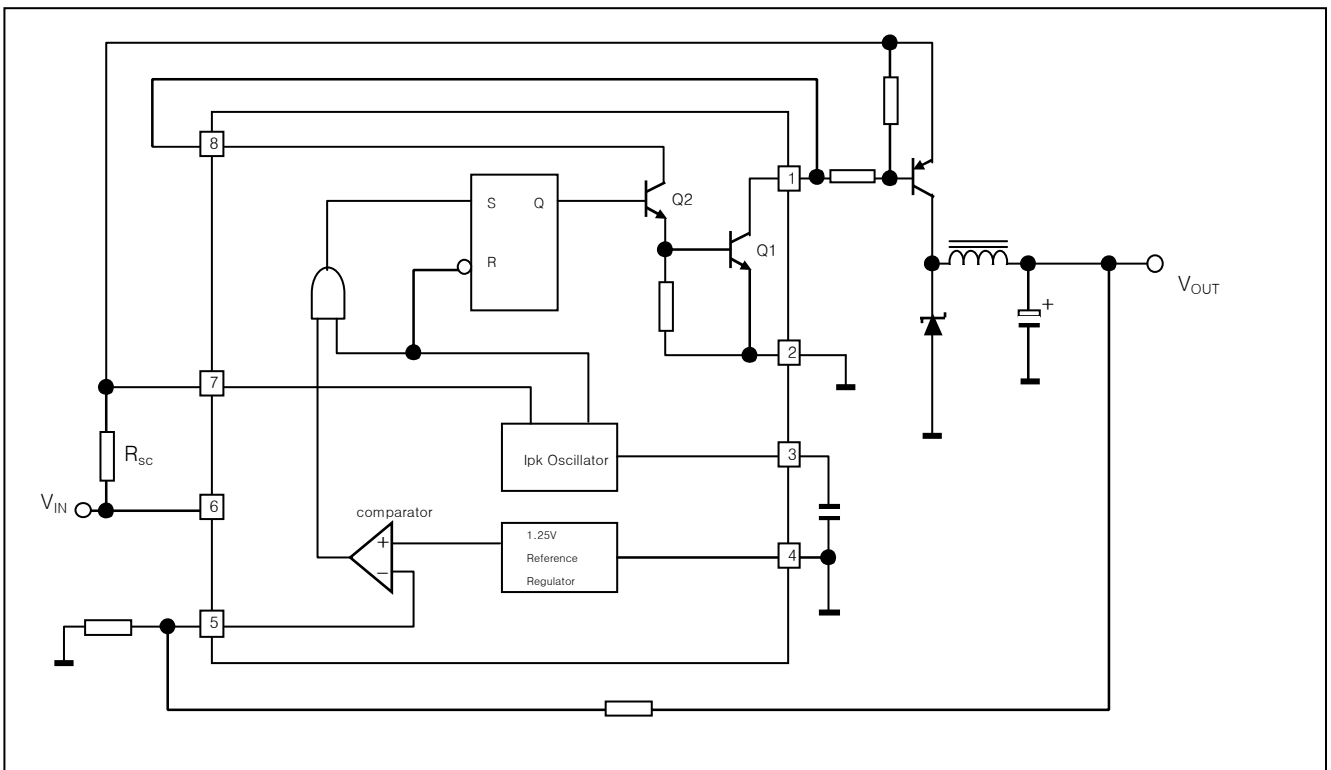


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Step-Down With External NPN Switch

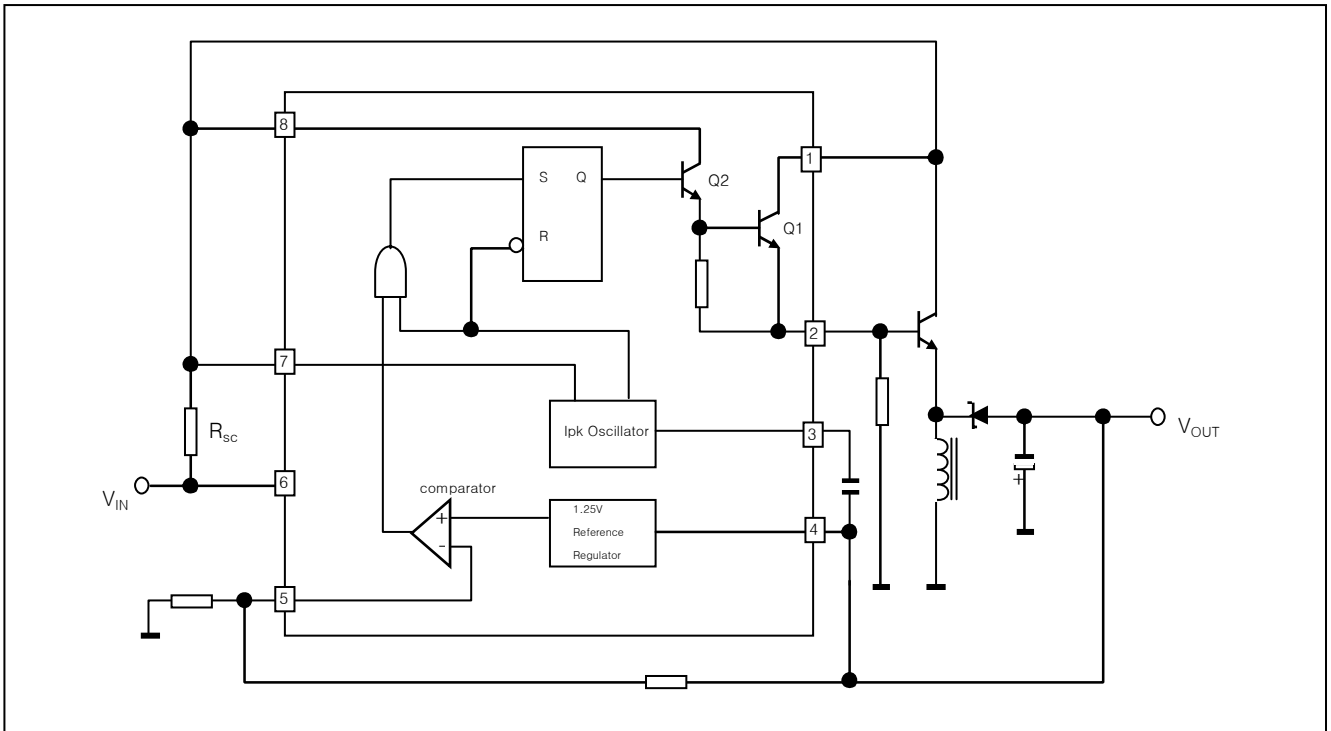


Step-Down With External PNP Switch

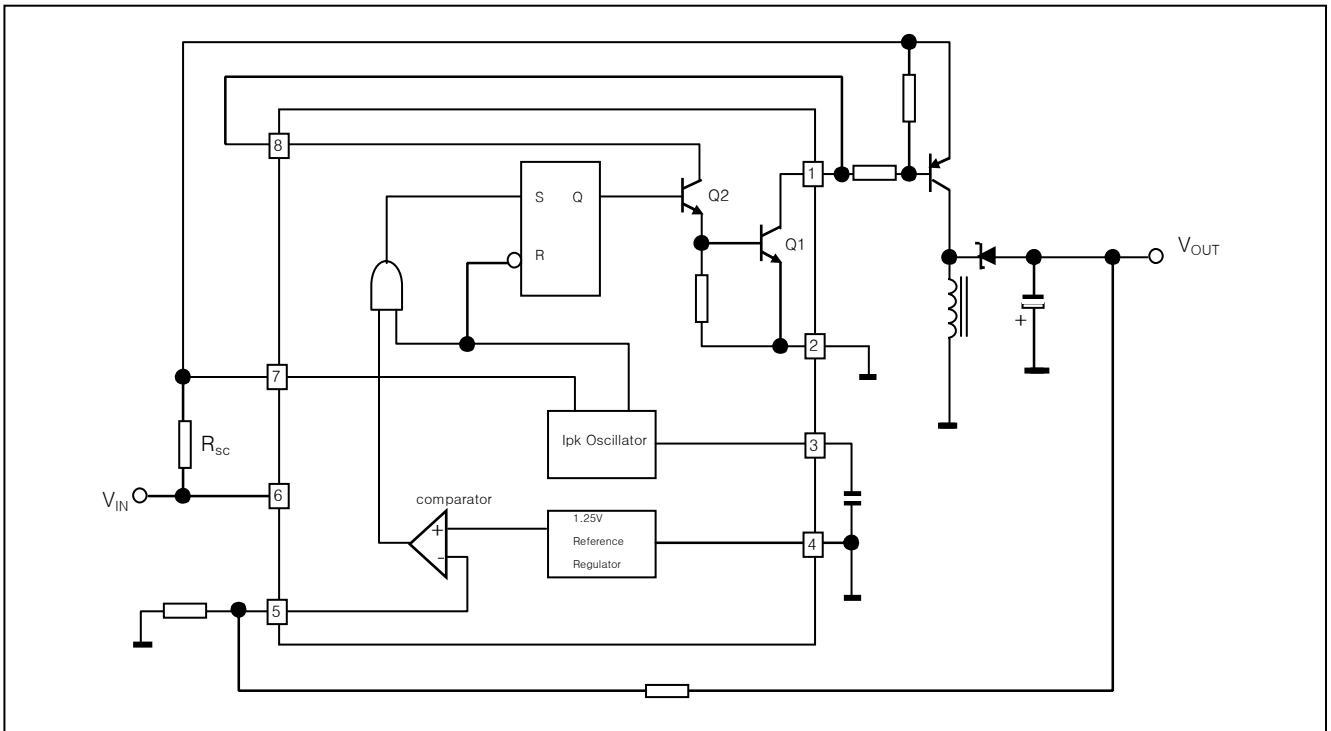


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Voltage Inverting With External NPN Switch

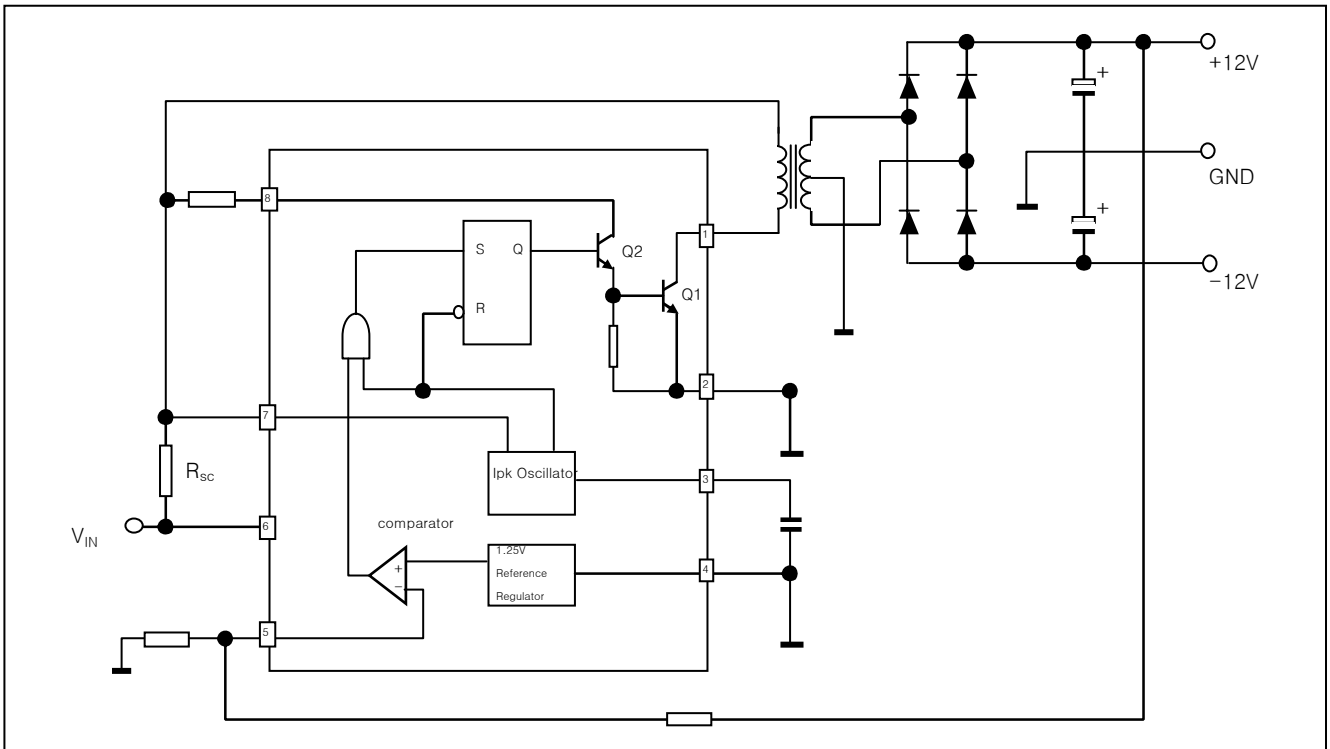


Voltage Inverting With External PNP Saturated Switch



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Dual Output Voltage



Higher Output Power, Higher Input Voltage

