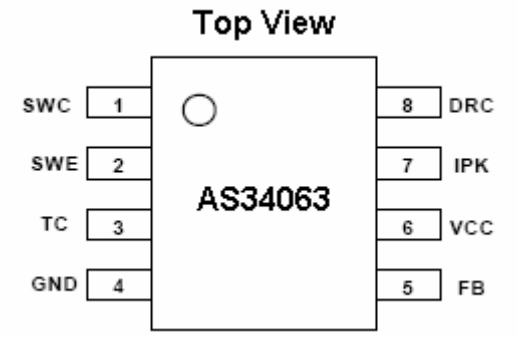
FEATURES

- Operation from 3.0V to 40V Input Voltage
- Low Standby Current
- Current Limiting
- Internal 1.6A Peak Current Switch
- Low Quiescent Current at 1.6mA
- Output Voltage Adjustable
- Frequency Operation from 100Hz to 100KHz
- Internal ±1.8% Reference
- SOP8L Leadfree Package

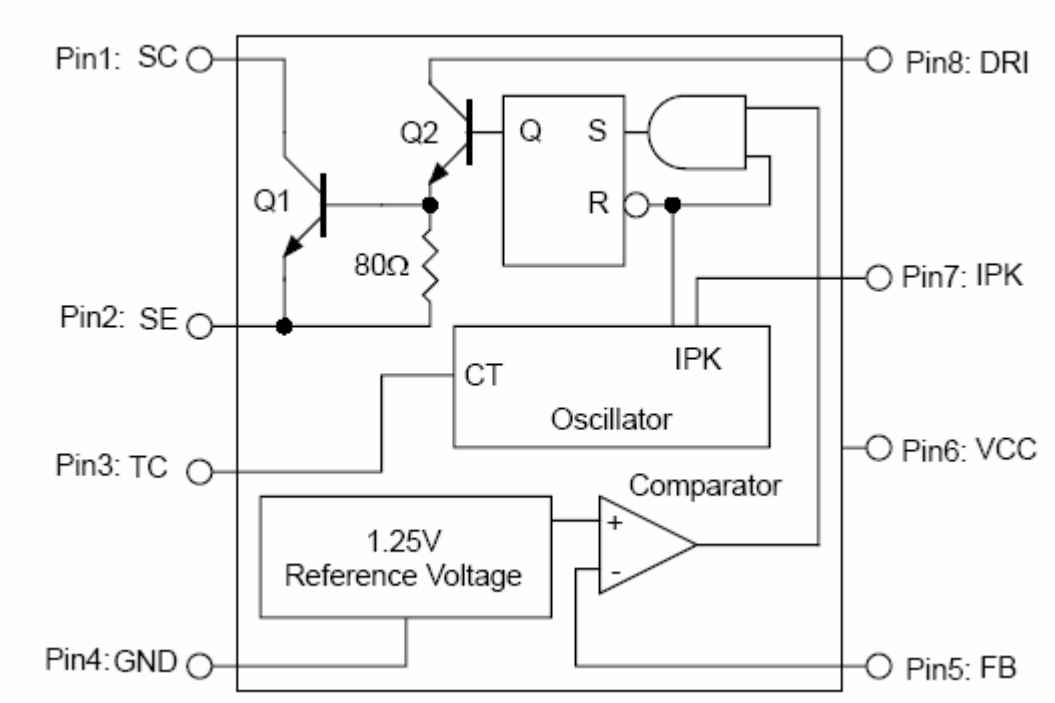
GENERAL DESCRIPTION

The AS34063 Series is a monolithic control circuit containing the primary functions required for DC-to-DC converters. These devices consists of an internal temperature compensated reference, comparator, controlled duty cycle oscillator with an active current limit circuit, driver and high current output switch. This series is specifically designed for incorporating in Step-Down and Step-Up and Voltage-Inverting applications with a minimum number of external components.

PIN CONNECTIONS



FUNCTIONAL BLOCK DIAGRAM

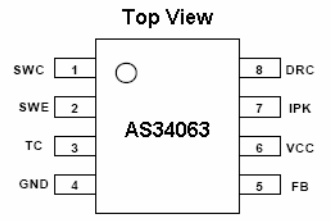


ABSOLUTE MAXIMUM RATINGS

(Note1)

Power Supply Voltage 40V
Comparator Input Voltage..... -0.3V to 40V
Switch Collector Voltage 40V
Switch Emitter Voltage 40V
Switch Current.....1.5A
Power Dissipation(Ta=25℃) 625mW
Operating Temperature Range ....0℃ to 70℃
Storage Temperature Range ..... -65℃ to 150℃
Lead Temperature(Soldering, 10sec.) .....300℃

PACKAGE/ORDER INFORMATION



T_{JMAX}=125℃ (Note2)
θ_{JA}=125℃/W, P_D=625mW

ORDER PART NUMBER
AS34063CBT
PART MARKING
A34063

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

Note 2: T_J is calculated from the ambient temperature T_A and power dissipation P_D according to the following formula:

$T_J = T_A + P_D \times \Theta_{JA}$.

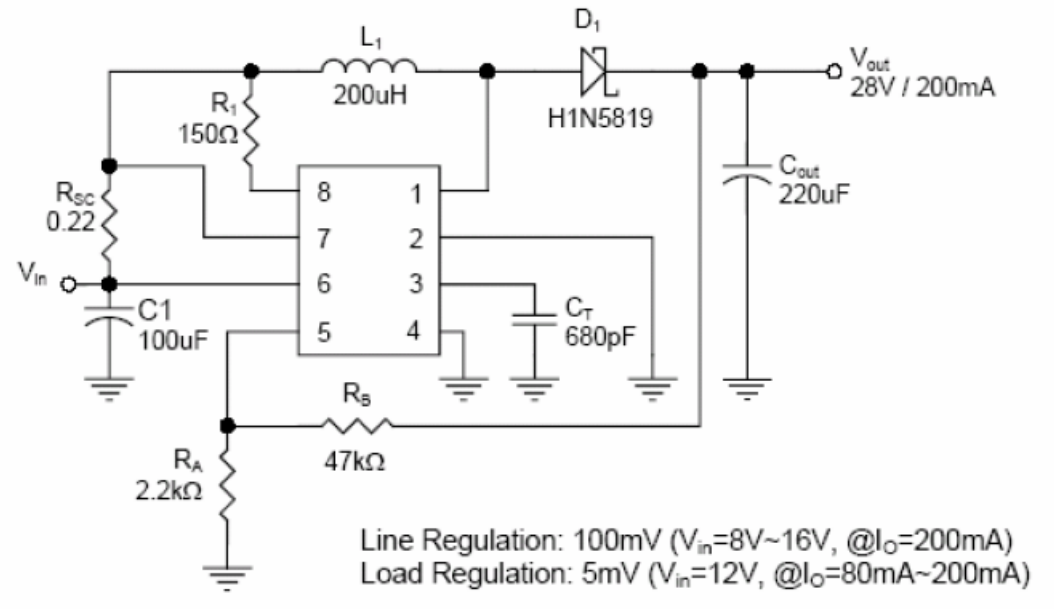
ELECTRICAL CHARACTERISTICS

V_{CC} = 5.0V, T_A =0~ 70°C Unless otherwise noted.

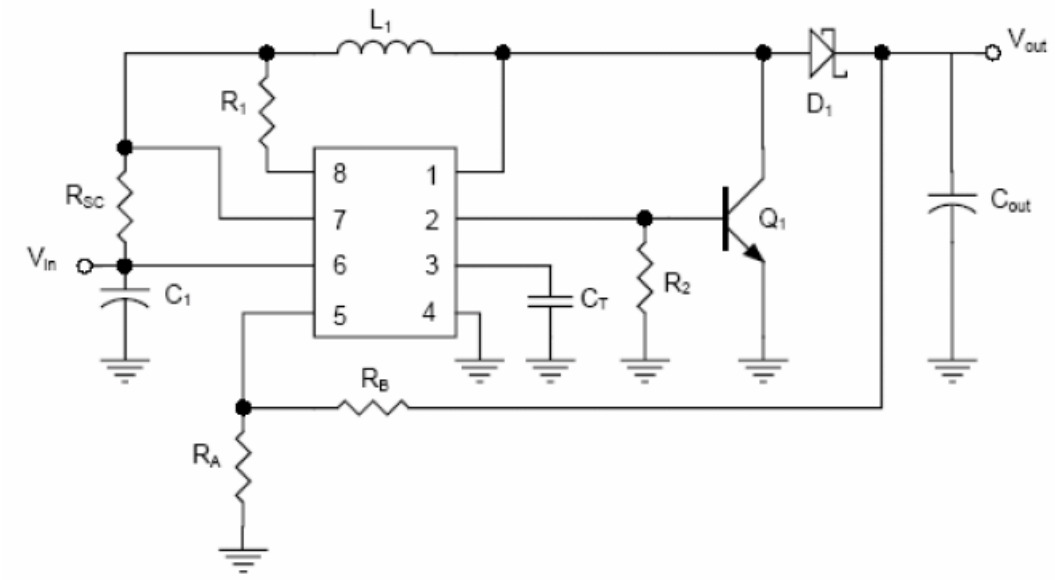
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Oscillator					
Frequency	V_{PIN5}=0V, C_T=1.0nF, T_A=25°C	24	33	42	KHz
Charge Current	V_{CC}=5.0V to 40V, T_A=25℃	10	25	40	μA
Discharge Current	V_{CC}=5.0V to 40V, T_A=25℃	100	150	200	μA
Discharge to Charge Current Ratio	Pin7 to Vcc, T_A=25℃	5.2	6.0	7.5	-
Current Limit Sense Voltage	I_{chg}=I_{dischg}, T_A=25℃	250	300	350	mV
Output Switch Section					
Saturation Voltage, Darlington Connection	I_{SW}=1.0A, Pins 1,8 connected	-	1.0	1.3	V
Saturation Voltage	I_{SW}=1.0A, I_D=50mA	-	0.4	0.7	V
DC Current Gain	I_{SW}=1.0A, V_{CE}=5.0V	35	120	-	
Collector Off-State Current	V_{CE}=40V, T_A=25℃	-	10	100	μA
Comparator Section					
Threshold Voltage		1.227	1.25	1.273	V
Threshold Voltage Line Regulation	V_{CC}=5.0V to 40V	-	1.5	6	mV
Input Bias Current	V_{IN}=0V	-	40	400	nA
Total Device					
Supply Current	V_{CC}=5V to 40V, C_T=1.0nF, Pin7=V_{CC}, V_{Pin5} ＞V_{FB}, Pin2=Gnd, remaining pins open	-	1.6	3	mA

TYPICAL APPLICATION CIRCUIT 1

Step – Up Converter

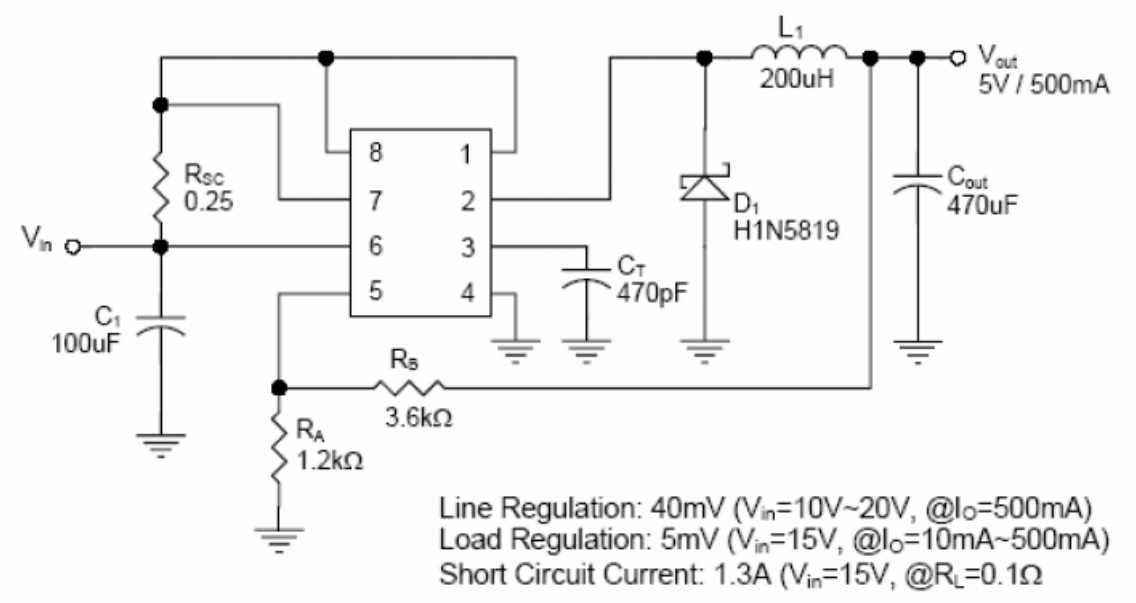


High Current Step – Up Converter

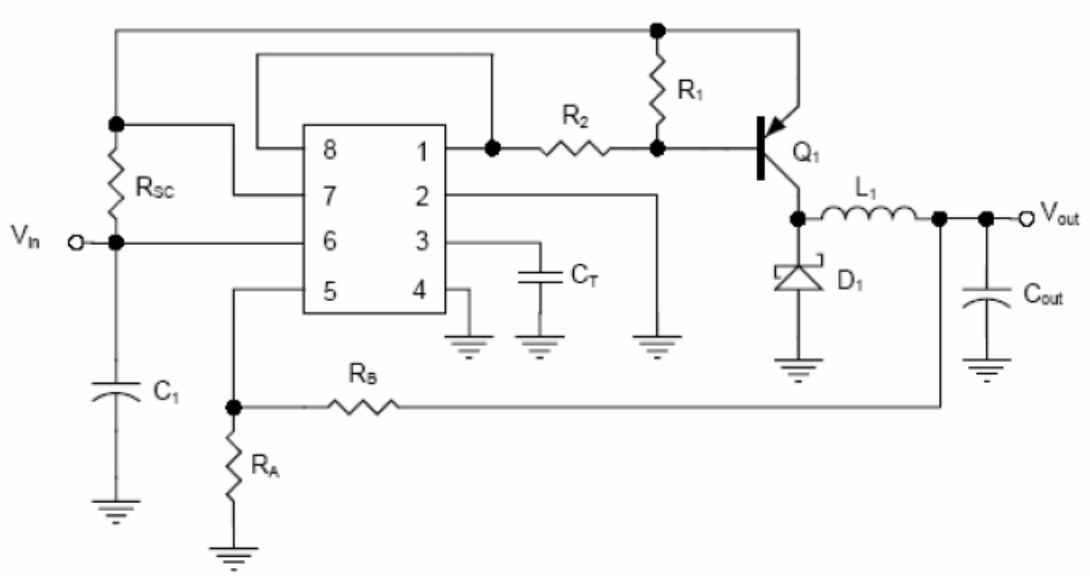


TYPICAL APPLICATION CIRCUIT 2

Step – Down Converter

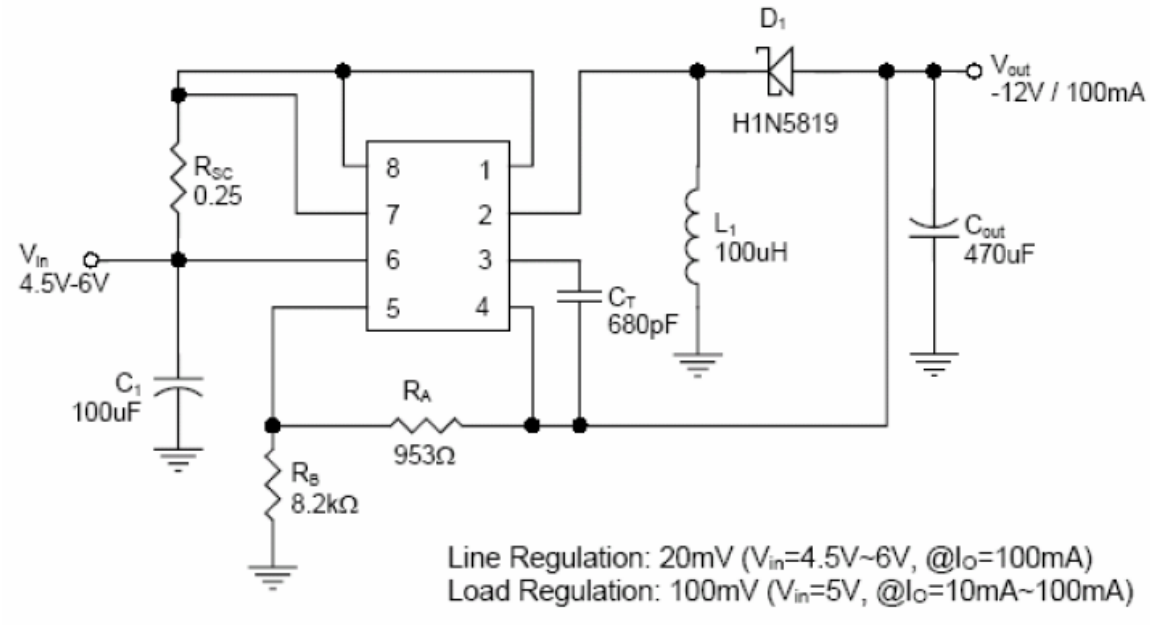


High Current Step – Down Converter

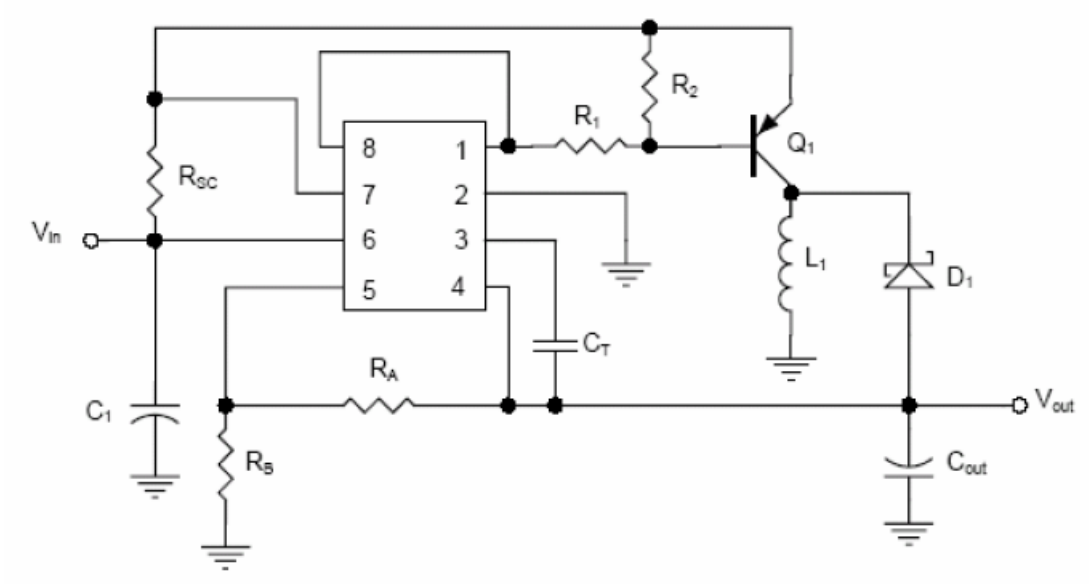


TYPICAL APPLICATION CIRCUIT 3

Voltage Inverting Converter



High Current Voltage Inverting Converter



DESIGN FORMULA TABLE

Calculation	Step-Up	Step-Down	Voltage-Inverting
t_{on}/t_{off}	$\frac{V_{out}+V_F-V_{in(min)}}{V_{in(min)}-V_{sat}}$	$\frac{V_{out}+V_F}{V_{in(min)}-V_{sat}-V_{out}}$	$\frac{\lvert V_{out}\rvert+V_F}{V_{in}-V_{sat}}$
$(t_{on}+t_{off})$	1/f	1/f	1/f
t_{off}	$\frac{t_{on}+t_{off}}{\frac{t_{on}}{t_{off}}+1}$	$\frac{t_{on}+t_{off}}{\frac{t_{on}}{t_{off}}+1}$	$\frac{t_{on}+t_{off}}{\frac{t_{on}}{t_{off}}+1}$
t_{on}	$(t_{on}+t_{off})-t_{off}$	$(t_{on}+t_{off})-t_{off}$	$(t_{on}+t_{off})-t_{off}$
C_T	$4.0\times10^{-5}t_{on}$	$4.0\times10^{-5}t_{on}$	$4.0\times10^{-5}t_{on}$
$I_{pk(switch)}$	$2I_{out(max)}(t_{on}/t_{off}+1)$	$2I_{out(max)}$	$2I_{out(max)}(t_{on}/t_{off}+1)$
R_{sc}	$0.3/I_{pk(switch)}$	$0.3/I_{pk(switch)}$	$0.3/I_{pk(switch)}$
$L_{(min)}$	$\frac{(V_{in(min)}-V_{sat})}{I_{pk(switch)}}t_{on(max)}$	$\frac{(V_{in(min)}-V_{sat}-V_{out})}{I_{pk(switch)}}t_{on(max)}$	$\frac{(V_{in(min)}-V_{sat})}{I_{pk(switch)}}t_{on(max)}$
C_O	$9\frac{I_{out}\,t_{on}}{V_{ripple(pp)}}$	$\frac{I_{pk(switch)}(t_{off}+t_{on})}{8V_{ripple(pp)}}$	$9\frac{I_{out}\,t_{on}}{V_{ripple(pp)}}$

V_{sat} = Saturation voltage of the output switch.
V_F = Forward voltage drop of the output rectifier.

The following power supply characteristics must be chosen:
V_{in} -Nominal input voltage.
V_{out} -Desired output voltage, $|V_{out}|=1.25(1+R2/R1)$
I_{out} -Desired output current.
f_{min} -Minimum desired output switching frequency at the selected values of V_{in} and I_o.
$V_{ripple(pp)}$ -Desired peak-to-peak output ripple voltage, In practice, the calculated capacitor value will need to be increased due to its equivalent series resistance and board layout. The ripple voltage should be kept to a low value since it will directly affect the line and load regulation.

PACKAGE DESCRIPTION Dimensions in millimeters unless otherwise noted

Package
8-Lead Plastic SOP-8L