

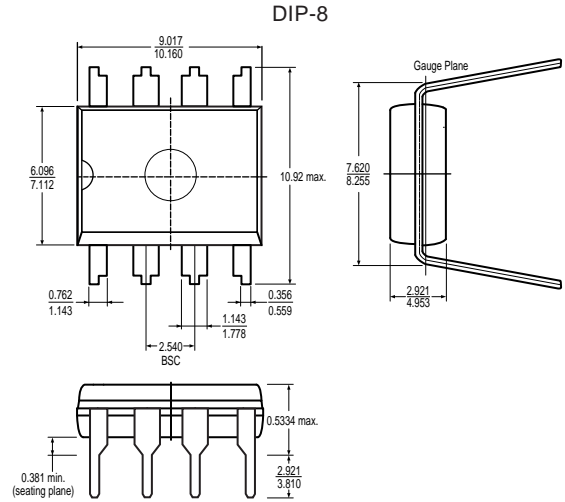
RoHS Compliant Product

Description

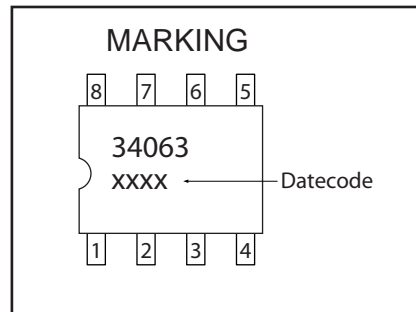
The SGP34063 is a monolithic regulator subsystem, intended for use as DC to DC converter. This device contains a temperature compensated band gap reference, a duty-cycle control oscillator, driver and high current output switch. It can be used for step-down, step-up or inverting switching regulators as well as for series pass regulators.

Features

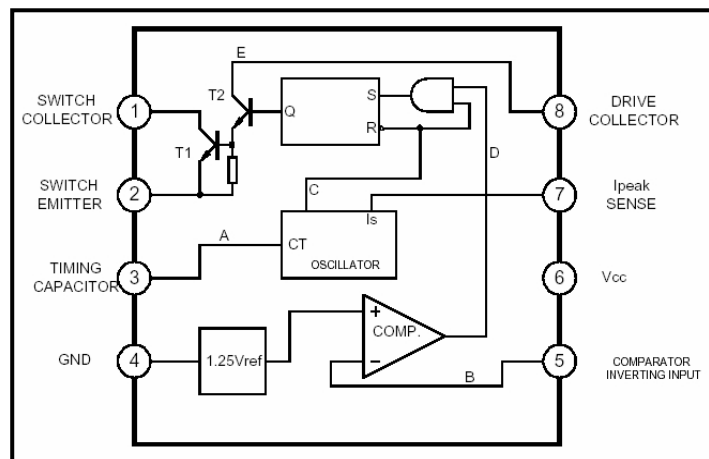
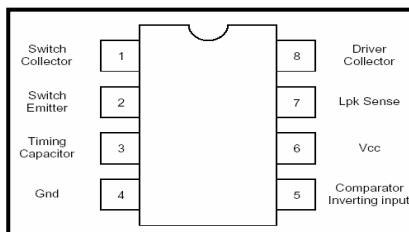
- *Operation from 3.0V to 40V.
- *Short circuit current limiting.
- *Low standby current.
- *Output switch current of 1.5A without external transistors.
- *Frequency of operation from 100Hz to 100kHz.
- *Step-up, step-down or inverting switch regulators.



Dimensions in mm



Pin Configuration & Representative Schematic Diagram





Elektronische Bauelemente

SGP34063

DC To DC Converter Controller

Absolute Maximum Ratings at Ta = 25 °C

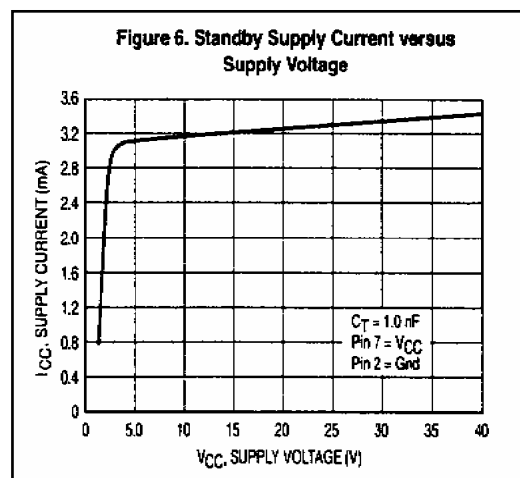
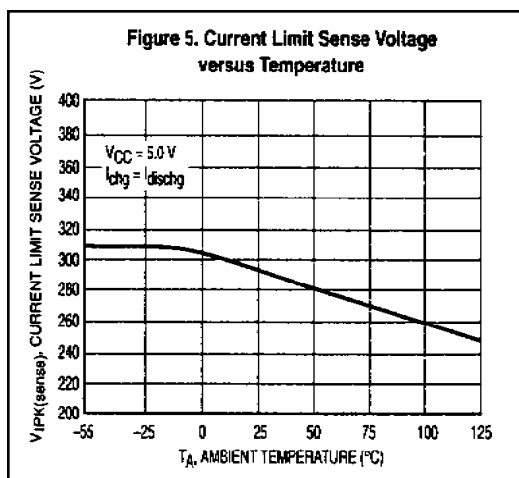
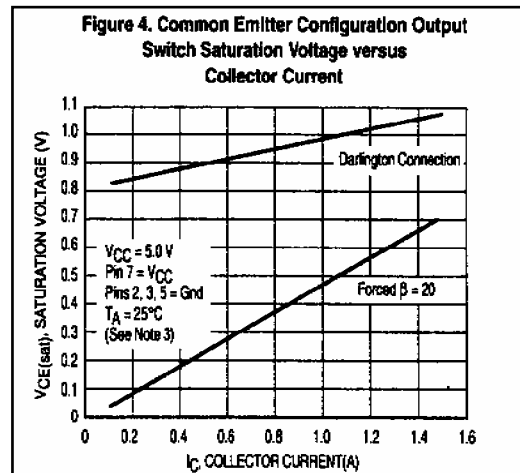
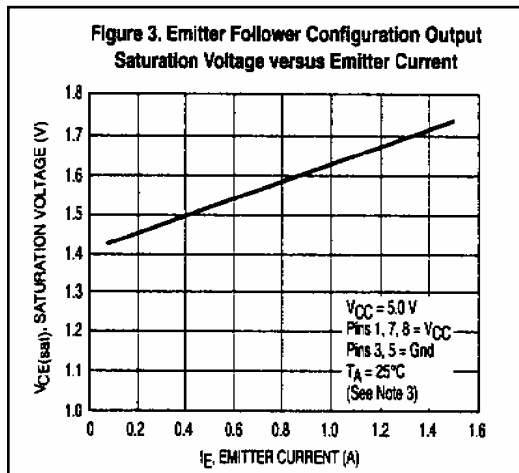
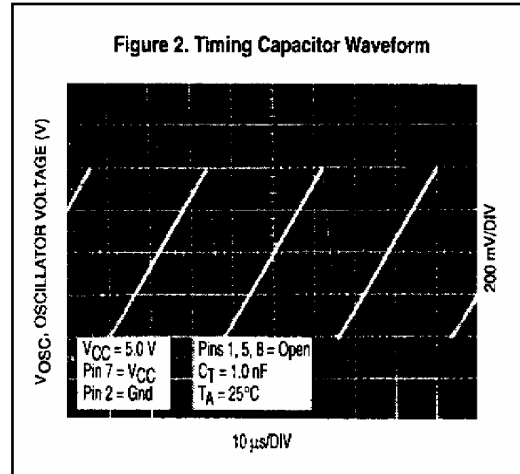
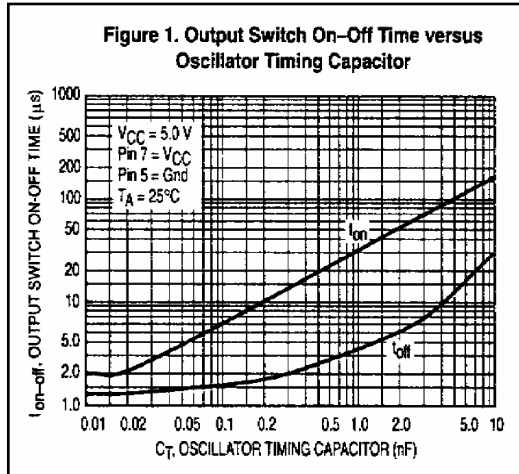
Parameter	Symbol	Value	Unit
Operating Junction Temperature	Tj	150	°C
Operating Ambient Temperature Range	Ta	0 ~ 70	°C
Storage Temperature Range	Tstg	-65 ~ 150	°C
Supply Voltage	Vcc	40	V
Comparator Input Voltage Range	Vi(comp)	-0.3 ~ +40	V
Switch Collector Voltage	Vc(sw)	40	V
Switch Emitter Voltage	Ve(sw)	40	V
Switch Collector to Emitter Voltage	Vce(dr)	40	V
Switch Current	Isw	1.5	A
Power Dissipation	Pd	1250	mW
Thermal Resistance	RθJA	100	°C / W

Electrical Characteristics (0 °C ≤ TA ≤ 70°C, Vcc=5V unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit.
Oscillator						
Frequency	fosc	V _{Pin5} =0 V, C _T =1.0 nF, Ta=25°C	24	42	48	kHz
Charging Current	Ichg	Vcc = 5 to 40, Ta = 25°C	22	31	42	uA
Discharging Current	Idischg	Vcc = 5 to 40, Ta = 25°C	140	190	260	uA
Discharge to Charge Current Ratio	K	Pin7 to Vcc, Ta = 25°C	5.2	6.1	7.5	
Current Limit Sense Voltage	Vsense	Ichg = Idischg, Ta = 25°C	250	300	350	mV
Output Switch						
Saturation Voltage 1 (note)	Vce(sat)1	Isw = 1A, Vc(driver) = Vc(sw)		0.95	1.3	V
Saturation Voltage 2 (note)	Vce(sat)2	Isw = 1A, Vc(driver) = 50mA		0.45	0.7	V
DC Current Gain (note)	Gi(DC)	Isw = 1A, Vce = 5V, Ta = 25°C	50	180		
Collect Off State Current (note)	Ic(off)	Vce = 40V, Ta = 25°C		0.01	100	uA
Comparator						
Threshold Voltage	Vth	Vcc = 5V, Ta = 25°C 34063A	1.241	1.25	1.259	V
		34063B	1.237	1.25	1.262	V
		34063C	1.225	1.25	1.275	V
Threshold Voltage Line Regulation	Vth	Vcc = 3 ~ 40V		2	5	mV
Input Bias Current	Ibias	Vi = 0V		50	400	nA
Total Device						
Supply Current	Icc	Vcc = 5 ~ 40V, Ct = 0.001, Pin7 to Vcc, Vc > Vth, Pin2 = GND		2.7	4	mA

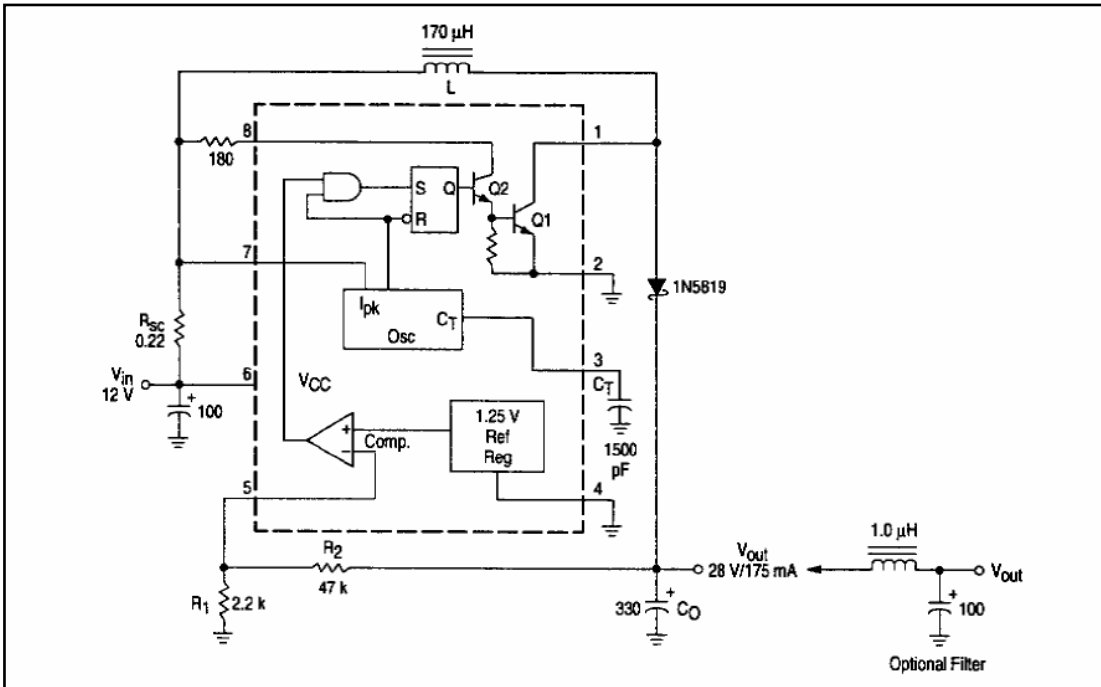
Note : Output switch tests are performed under pulsed conditions to minimize power dissipation.

Characteristics Curve



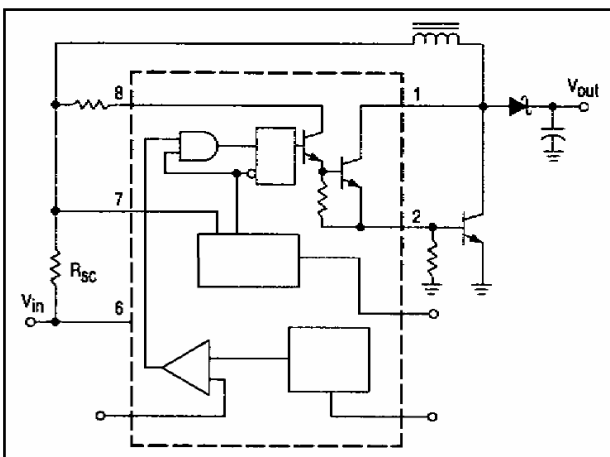
Application Information

Step-Up Converter

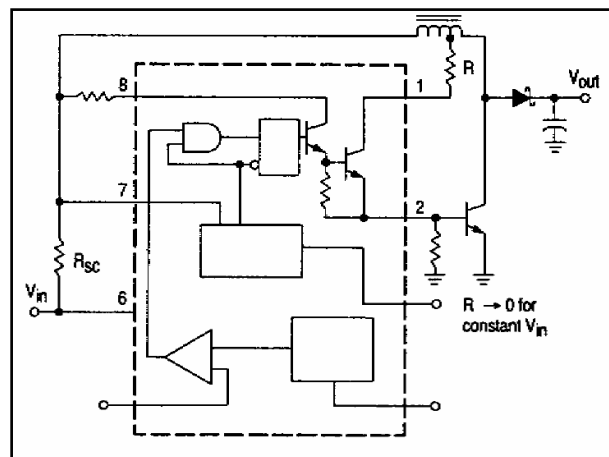


Test	Conditions	Results
Line Regulation	$V_{in} = 8V$ to $16V$, $I_o = 175mA$	$30mV = \pm 0.05\%$
Load Regulation	$V_{in} = 12V$, $I_o = 75mA$ to $175mA$	$10mV = \pm 0.017\%$
Output Ripple	$V_{in} = 12V$, $I_o = 175mA$	$400mV_{p-p}$
Efficiency	$V_{in} = 12V$, $I_o = 175mA$	87.7%
Output Ripple With Optional Filter	$V_{in} = 12V$, $I_o = 175mA$	$40mV_{p-p}$

External Current Boost Connections for I_c Peak Greater than 1.5A



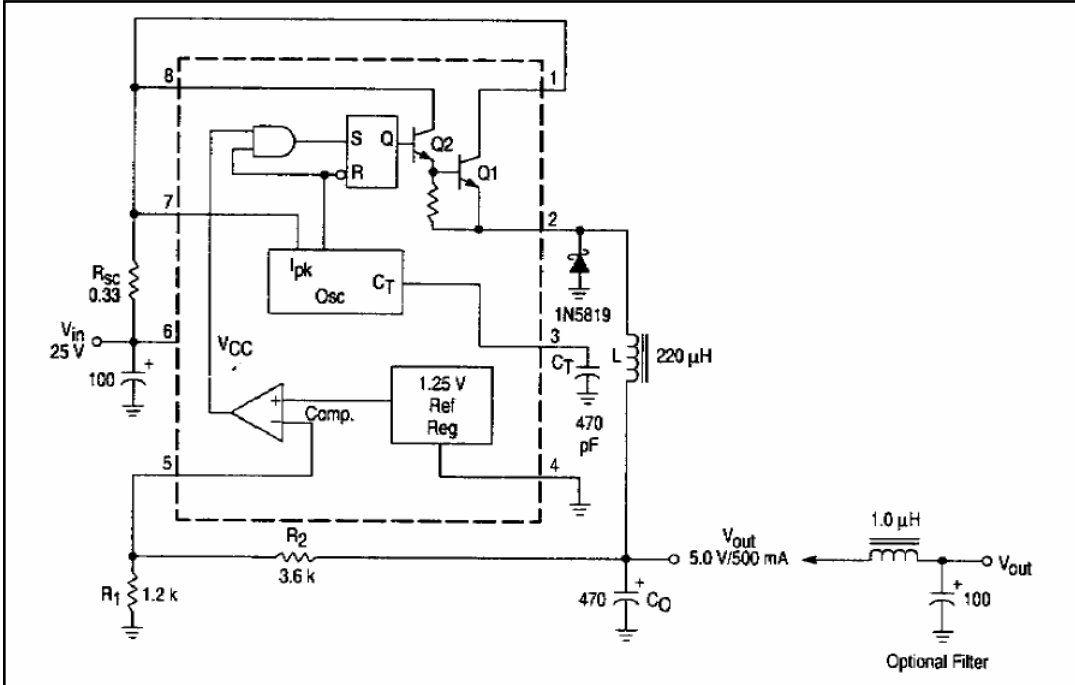
External NPN Switch



External NPN Saturated Switch (NOTE)

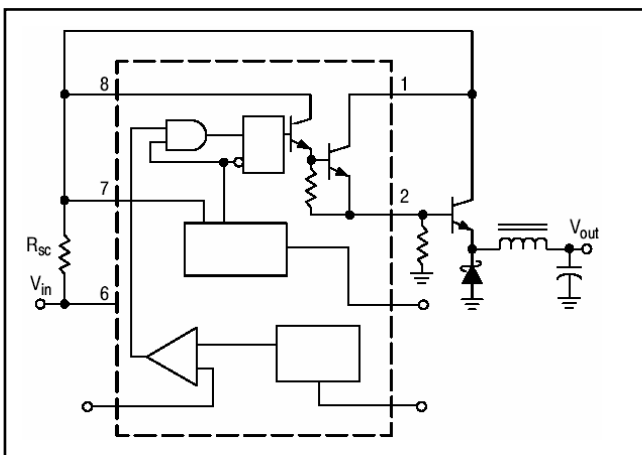
NOTE : If the switch is driven into hard saturation (non-Darlington configuration) at low switch currents ($\leq 300mA$) and high driver currents ($\geq 30mA$) it may take up to 2.0 μs to come out of saturation. This condition will shorten the off time at frequencies $\geq 30kHz$, and is magnified at 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.

Step-Down Converter

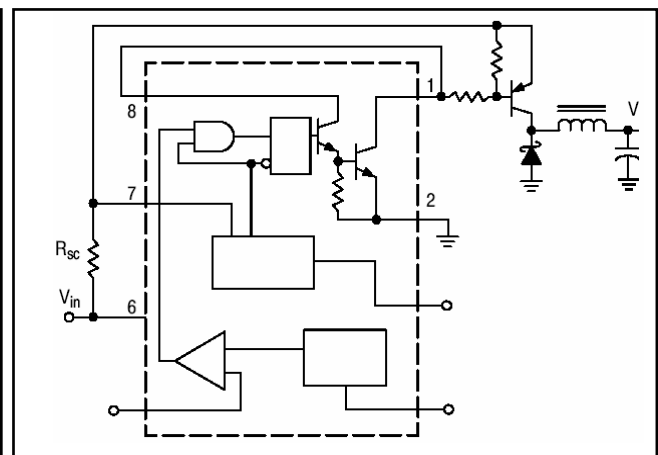


Test	Conditions	Results
Line Regulation	$V_{in} = 15V \text{ to } 25V, I_o = 50mA$	$12mV = \pm 0.12\%$
Load Regulation	$V_{in} = 25V, I_o = 50mA \text{ to } 500mA$	$3mV = \pm 0.03\%$
Output Ripple	$V_{in} = 25V, I_o = 500mA$	$120mVp-p$
Short Circuit Current	$V_{in} = 25V, R_L = 0.1\Omega$	$1.1A$
Efficiency	$V_{in} = 25V, I_o = 500mA$	83.7%
Output Ripple With Optional Filter	$V_{in} = 25V, I_o = 500mA$	$40mVp-p$

External Current Boost Connections for I_c Peak Greater than 1.5A

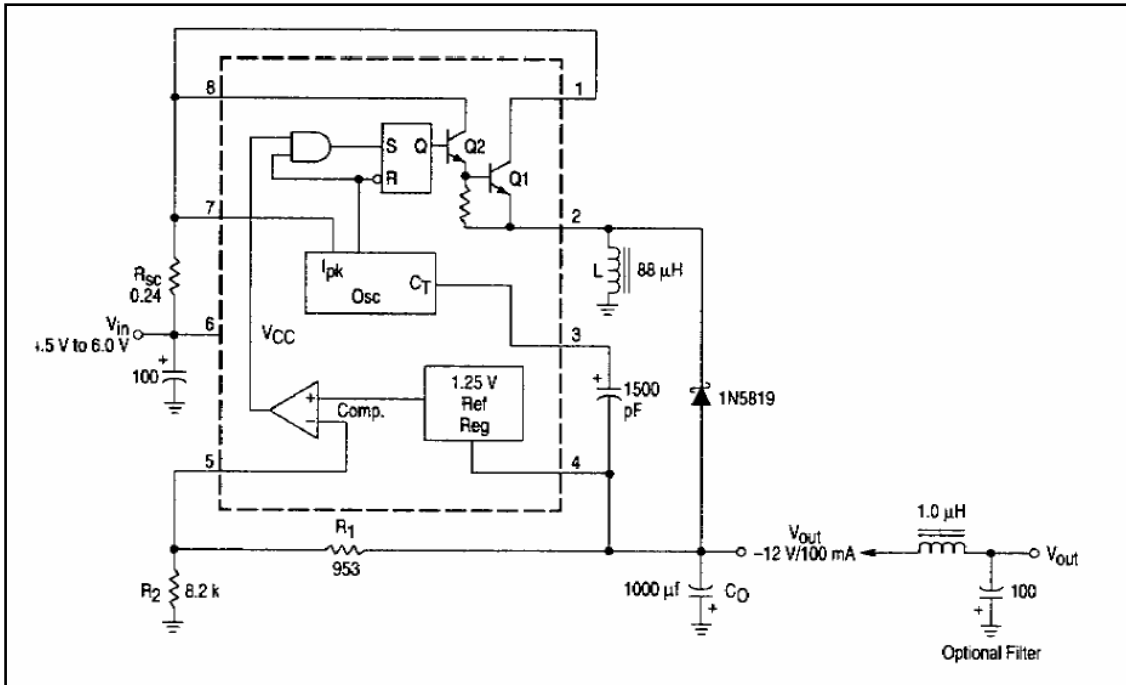


External NPN Switch



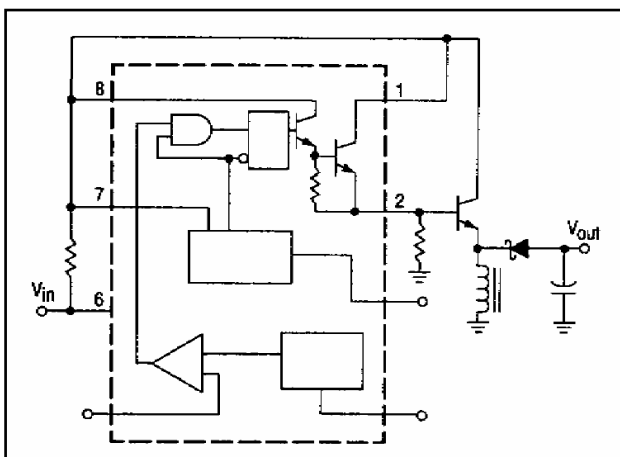
External PNP Saturated Switch

Voltage Inverting Converter

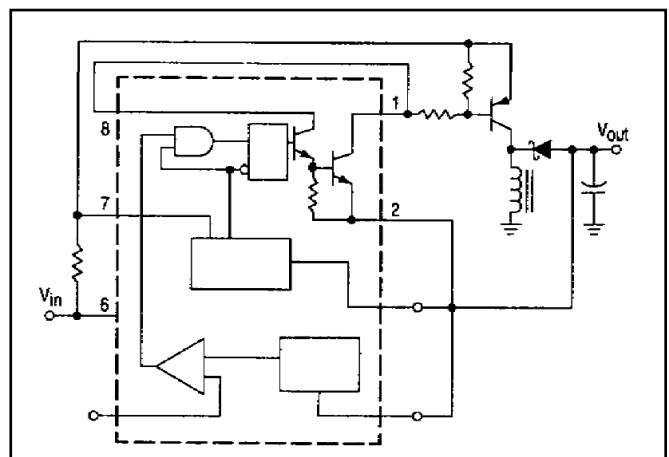


Test	Conditions	Results
Line Regulation	$V_{in} = 4.5V$ to $6.0V$, $I_o = 100mA$	$3mV = \pm 0.12\%$
Load Regulation	$V_{in} = 5V$, $I_o = 10mA$ to $100mA$	$0.022V = \pm 0.09\%$
Output Ripple	$V_{in} = 5V$, $I_o = 100mA$	$500mV_{p-p}$
Short Circuit Current	$V_{in} = 5V$, $R_L = 0.1\Omega$	$910mA$
Efficiency	$V_{in} = 5V$, $I_o = 100mA$	62.2%
Output Ripple With Optional Filter	$V_{in} = 5V$, $I_o = 100mA$	$70mV_{p-p}$

External Current Boost Connections for I_c Peak Greater than 1.5A



External NPN Switch



External PNP Saturated Switch