

Description

GM34063 has all the functions required for DC-to-DC converters: an internal Temperature-compensated reference, comparator, controlled duty cycle oscillator with an active current limit circuit, driver, and high current output switch.

GM34063 is designed for step-down, step-up and voltage-inverting applications by using a minimum number of external components.

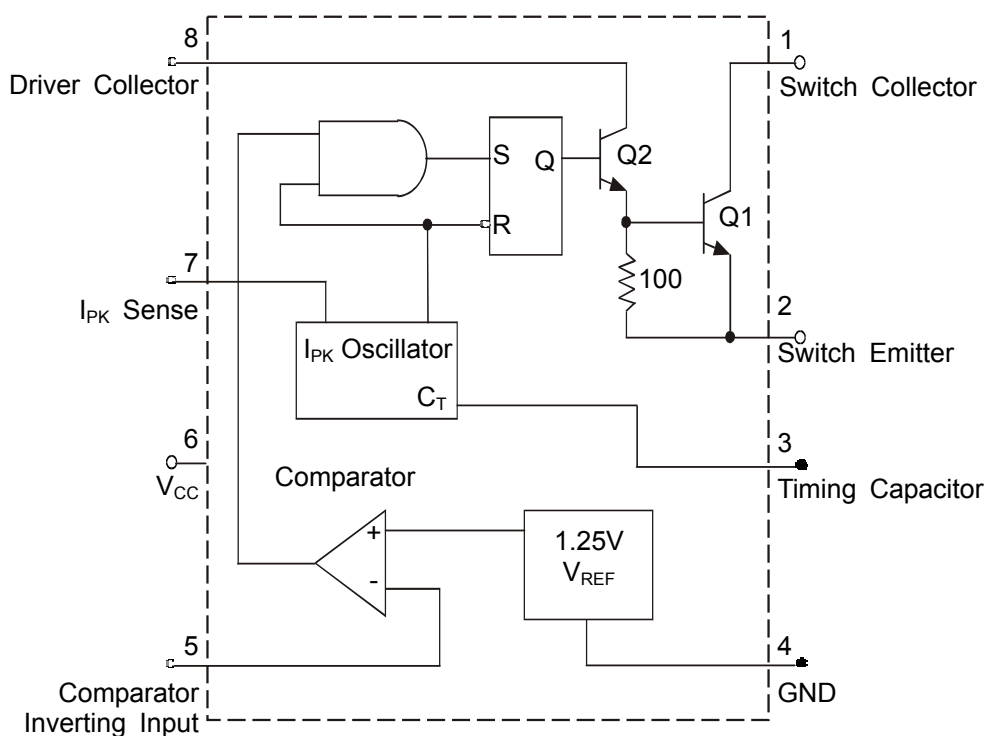
Features

- ◆ 3.0V to 40V Input
- ◆ Adjustable Output Voltage
- ◆ Output Switch Current to 1.5A
- ◆ Low Standby Current
- ◆ Operating Frequency to 100kHz
- ◆ Precision 1 % Reference available

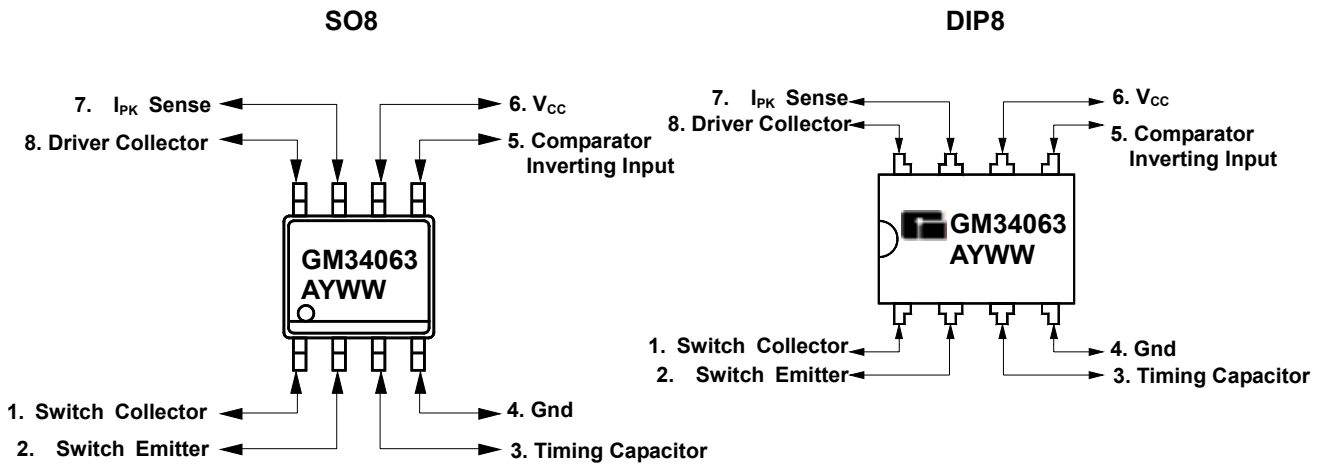
Application

- CD-ROM
- Motherboards
- SMPS Power Supply
- Battery Chargers
- DSL Modem

Schematic Diagram



Marking Information and Pin Configurations (Top View)



A: Assembly / Test site code
Y: Year
WW: Week

Ordering Information

Ordering Number	Package	Shipping
GM34063D8T	DIP-8	60 Units / Tube
GM34063S8T	SOP-8	100 Units / Tube
GM34063S8R	SOP-8	2,500 Units / Tape & Reel

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Power Supply Voltage	V_{CC}	40	Vdc
Comparator Input Voltage Range	V_{IR}	-0.3 to +40	Vdc
Switch Collector Voltage	$V_{C(\text{switch})}$	40	Vdc
Switch Emitter Voltage ($P_{IN1} = 40V$)	$V_{E(\text{switch})}$	40	Vdc
Switch Collector Emitter Voltage	$V_{CE(\text{switch})}$	40	Vdc
Driver Collector Voltage	$V_{C(\text{driver})}$	40	Vdc
Driver Collect Current (Note 1)	$I_{C(\text{driver})}$	100	mA
Switch Current	I_{SW}	1.5	A
Power dissipation	DIP 8	780	mW
	SO 8	510	
Operating Temperature Range		-40 to 125	
Storage Temperature		- 65 to 150	
Lead Temperature (soldering 10 sec.)		260	

Note 1. Maximum package power dissipation limits must be observed

Electrical Characteristics ($V_{CC} = 5.0V$, $T_A = 25$ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OSCILLATOR						
Frequency	f_{OSC}	$V_{PIN5} = 0V$, $C_T = 1.0nF$	24	33	42	kHz
Charge Current	I_{chg}	$V_{CC} = 5.0V$ to $40V$	24	35	42	μA
Discharge Current	I_{dischg}	$V_{CC} = 5.0V$ to $40V$	140	220	260	μA
Discharge to Charge Current Ratio	I_{dischg}/I_{chg}	Pin 7 to V_{CC}	5.2	6.5	7.5	-
Current Limit Sense Voltage	$V_{ipk(sense)}$	$I_{chg} = I_{dischg}$	250	300	350	mV
OUTPUT SWITCH (Note 2)						
Saturation Voltage 1	$V_{CE(sat1)}$	Darlington Connection, $I_{SW} = 1.0A$, Pins 1, 8 Connected $T_A = \text{Full range}$		1.0	1.3	V
Saturation Voltage 2 (Note 3)	$V_{CE(sat2)}$	$I_{SW} = 1.0A$, $R_{PIN8} = 82\Omega$ to V_{CC} , Forced $\beta = 20$, $T_A = \text{Full range}$		0.45	0.7	V
DC Current Gain	h_{FE}	$I_{SW} = 1.0A$, $V_{CE} = 5V$	50	75		-
Collector Off-State Current	$I_{C(OFF)}$	$V_{CE} = 40V$, $T_A = \text{Full range}$	-	40	100	μA
COMPARATOR						
Threshold Voltage	V_{th}		1.225	1.25	1.275	V
		Note 4	1.238	1.25	1.263	
		$T_A = \text{Full range}$	1.21		1.29	
Threshold Voltage Line Regulation	Reg_{line}	$V_{CC} = 5.0V$ to $40V$, $T_A = \text{Full range}$	-	1.4	5.0	V
Input Bias Current	I_{IB}	$V_{in} = 0V$, $T_A = \text{Full range}$		-20	-400	nA
TOTAL DEVICE						
Supply Current	I_{CC}	$V_{CC} = 5V$ to $40V$, $C_T = 1.0nF$, Pin 7 = V_{CC} , $V_{pin 5} > V_{th}$, Pin 2 = Gnd, remaining pins open $T_A = \text{Full range}$			4.0	mA

Note 2. Low duty cycle pulse techniques are used during test to maintain junction temperature as close to ambient as possible.

Note 3. If the output switch is driven into hard saturation (non-Darlington configuration) at low switch currents (≤ 300 mA) and high driver currents (≥ 30 mA), it may take up to 2.0 ms 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:

Forced β of output switch:

$$\frac{I_c \text{ output}}{I_c \text{ driver} - 7.0 \text{ mA}^*} \geq 10$$

* The 100 Ω resistor in the emitter of the driver device requires about 7.0 mA before the output switch conducts.

Note 4. 1% accuracy is available upon special request

Typical Performance Characteristics

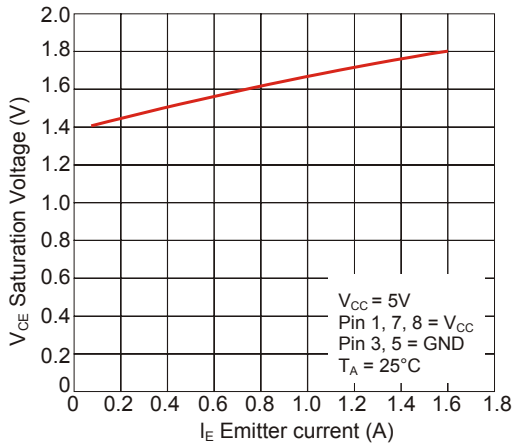


Figure 1: Emitter Follows Configuration Output

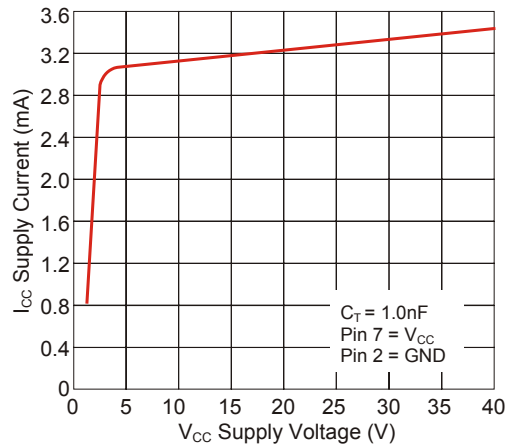


Figure 2: Standby Supply Current vs. Supply Voltage

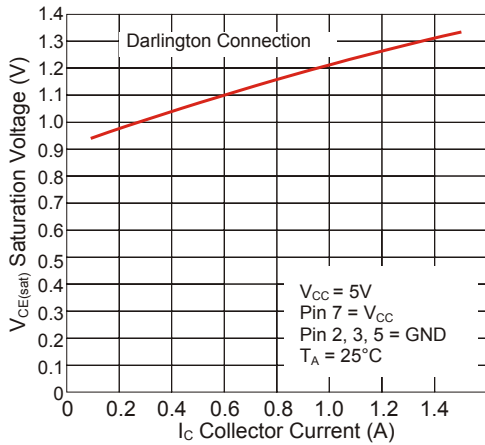


Figure 3: Common Emitter Configuration Output Switch Saturation Voltage vs. Collector Current

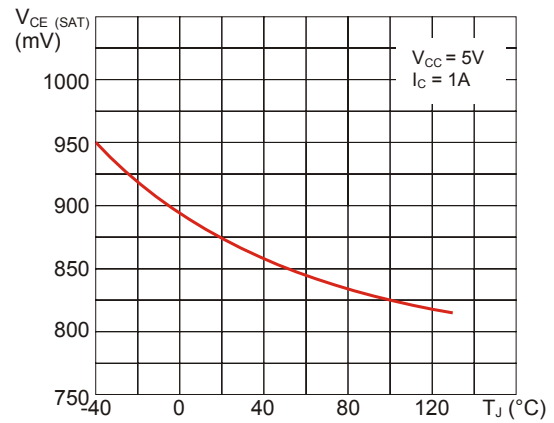


Figure 4: Darlington Configuration Collector Emitter Saturation Voltage ($V_{CE(SAT)}$) vs. Temperature

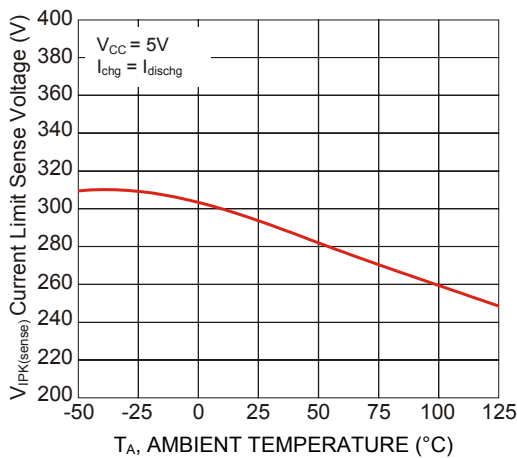


Figure 5: Current Limit Sense Voltage Vs. Temperature

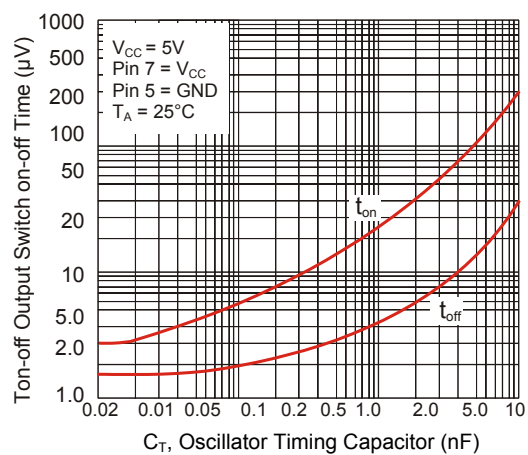
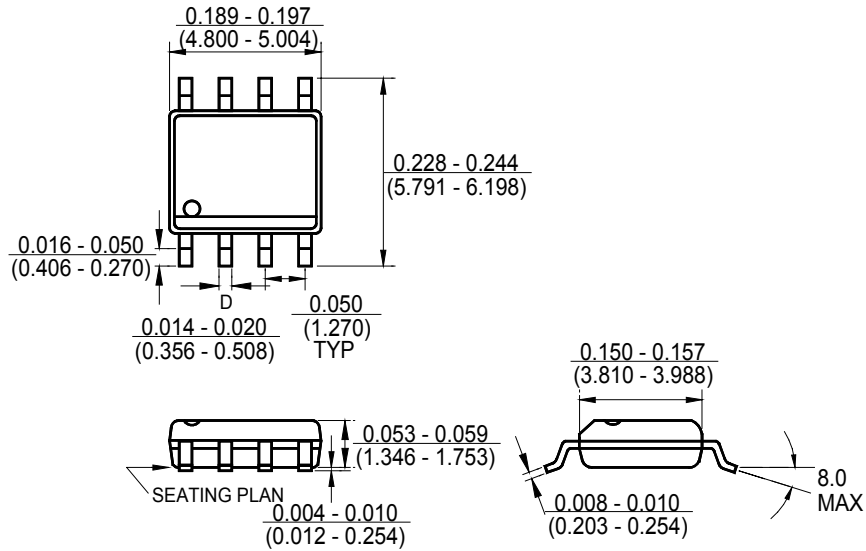
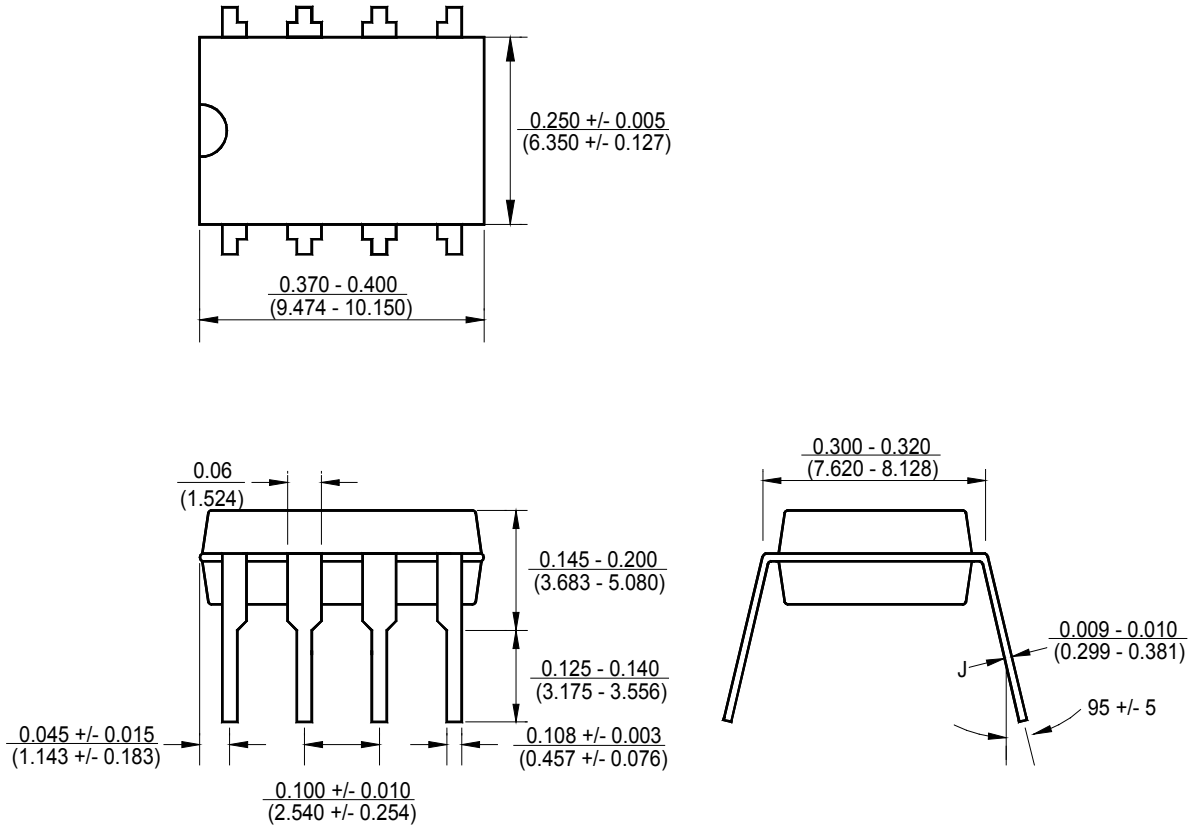


Figure 6: Output Switch On-Off Time vs. Oscillator Timing Capacitor

Package Outline Dimensions – SO 8



Package Outline Dimensions – DIP 8



Ordering Number

GM 34063 S8 R

APM Gamma	Circuit Type	Package Type	Shipping Type
		S8: SO 8 D8: DIP 8	R: Taping & Reel T: Tube