

Description

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

For GM34063E can operate for a temperature range from -40°C to 125°C while GM34063F can operate from -25°C to 85°C.

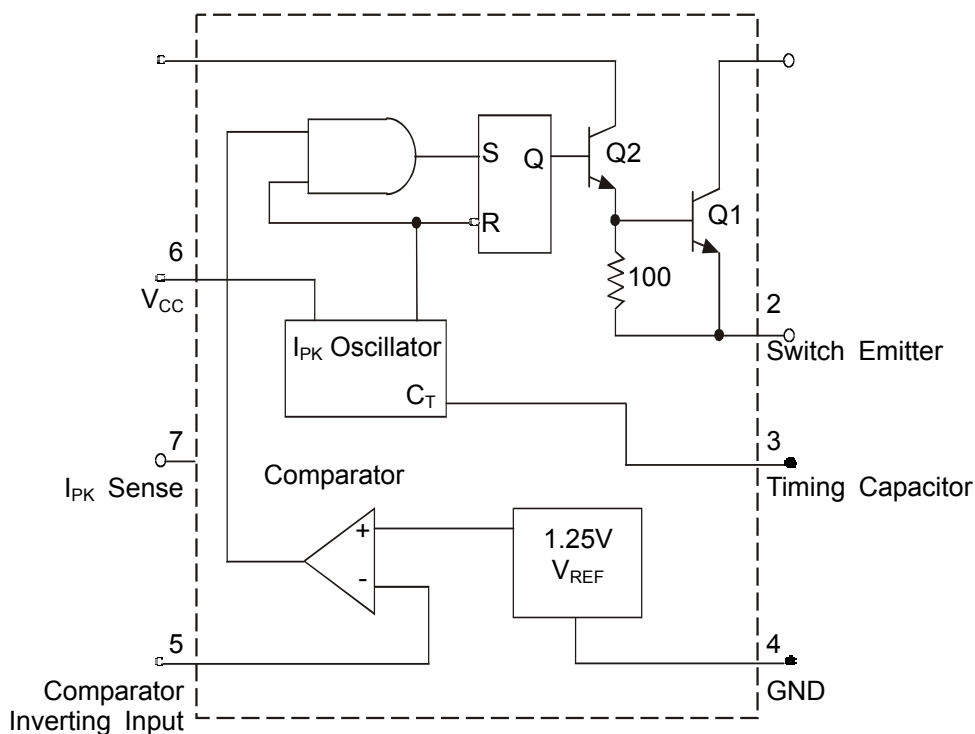
Features

- ◆ 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

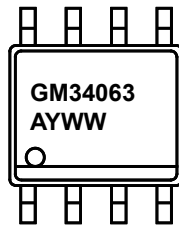


Pin Configurations

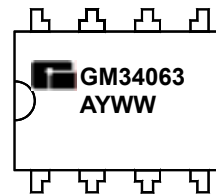
Pin 1	Switch Collector
Pin 2	Switch Emitter
Pin 3	Timing Capacitor
Pin 4	Gnd
Pin 5	Comparator Inverting Input
Pin 6	V _{CC}
Pin 7	I _{PK} Sense
Pin 8	Driver Collector

Marking Information, GM34063 – Pb Free Product

SO8



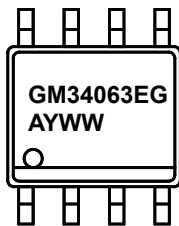
DIP8



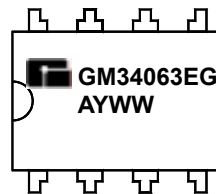
A: Assembly / Test site code
Y: Year
WW: Week

Marking Information, GM34063E – Green Product

SO8



DIP8



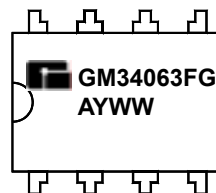
E: Operating Temperature Range: -40°C to 125°C
G: Green Product
A: Assembly / Test site code
Y: Year

Marking Information, GM34063F – Green Product

SO8



DIP8



F: Operating Temperature Range: -25°C to 85°C
G: Green Product
A: Assembly / Test site code
Y: Year

Ordering Information

GM34063 – Pb Free Product

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

GM34063E – Green Product

Ordering Number	Package	Shipping
GM34063ED8TG	DIP-8	60 Units / Tube
GM34063ES8TG	SOP-8	100 Units / Tube
GM34063ES8RG	SOP-8	2,500 Units / Tape & Reel

GM34063F – Green Product

Ordering Number	Package	Shipping
GM34063FD8TG	DIP-8	60 Units / Tube
GM34063FS8TG	SOP-8	100 Units / Tube
GM34063FS8RG	SOP-8	2,500 Units / Tape & Reel

Absolute Maximum Ratings

Parameter		Symbol	Vaule	Unit
Power Supply Voltage		V_{CC}	40	Vdc
Comparator Input Voltage Range		V_{IR}	-0.3 to +40	Vdc
Switch Collector Voltage		$V_{C(switch)}$	40	Vdc
Switch Emitter Voltage ($P_{IN1} = 40V$)		$V_{E(switch)}$	40	Vdc
Switch Collector Emitter Voltage		$V_{CE(switch)}$	40	Vdc
Driver Collector Voltage		$V_{C(driver)}$	40	Vdc
Driver Collect Current (Note 1)		$I_{C(driver)}$	100	mA
Switch Current		I_{SW}	1.5	A
Power dissipation	DIP 8		780	mW
	SO 8		510	
Operating Temperature Range	GM34063		0 to 70	°C
	GM34063E		-40 to 125	
	GM34063F		-25 to 85	
Storage Temperature			- 65 to 150	°C
Lead Temperature (soldering 10 sec.)			260	°C

Note 1. Maximum package power dissipation limits must be observed

Electrical Characteristics ($V_{CC} = 5.0V$, $T_A = 25^\circ C$ 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)	$V_{CE(sat2)}$	Darlington Connection, $I_{SW} = 1.0A$, $R_{PIN8} = 82\Omega$ 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	mV
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} , $V_{pin5} > V_{th}$, Pin 2 = Gnd, remaining pins open $T_A = \text{Full range}$	50	75		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 Application Circuits

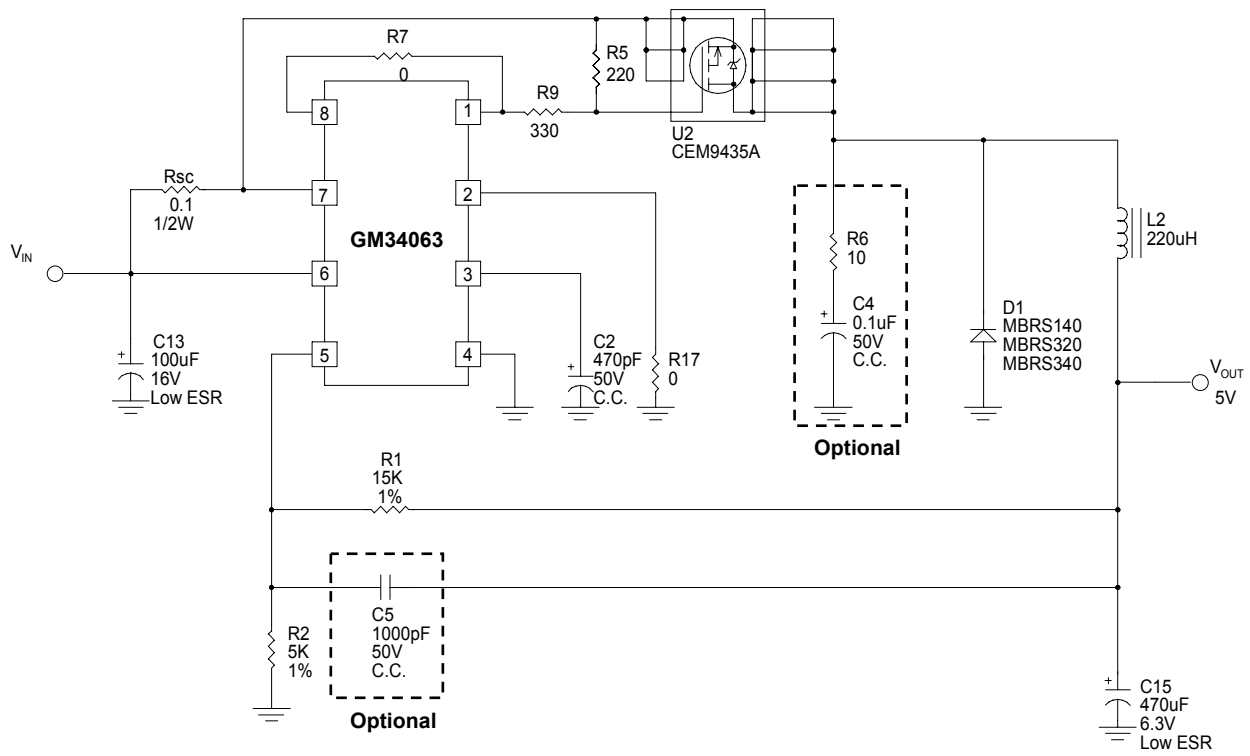


Figure 1 Step Down with External MOS Transistor

Typical Performance Characteristics

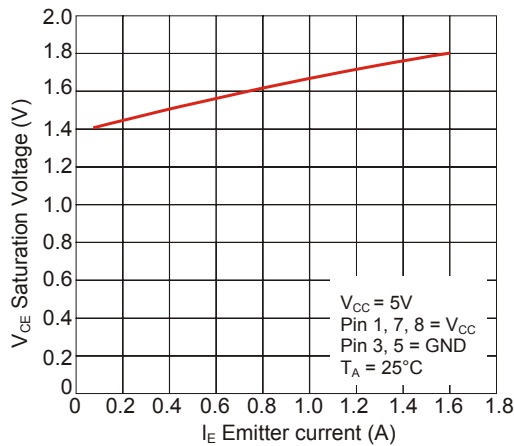


Figure 1: Emitter Follows Configuration Output

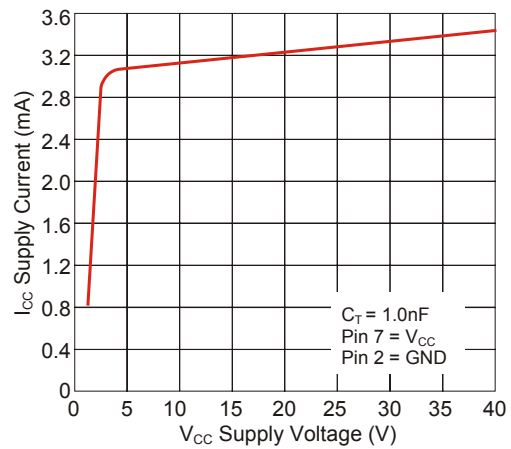


Figure 2: Standby Supply Current vs. Supply Voltage

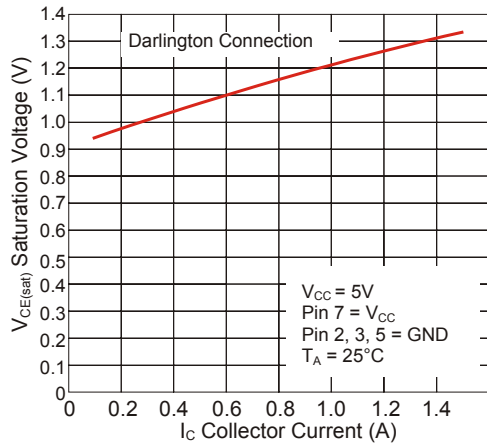


Figure 3: Common Emitter Configuration Output Switch Saturation Voltage vs. Collector Current

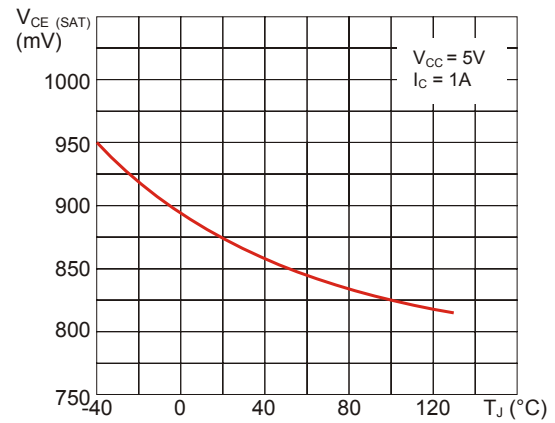


Figure 4: Darlington Configuration Collector Emitter Saturation Voltage ($V_{CE(SAT)}$) vs. Temperature

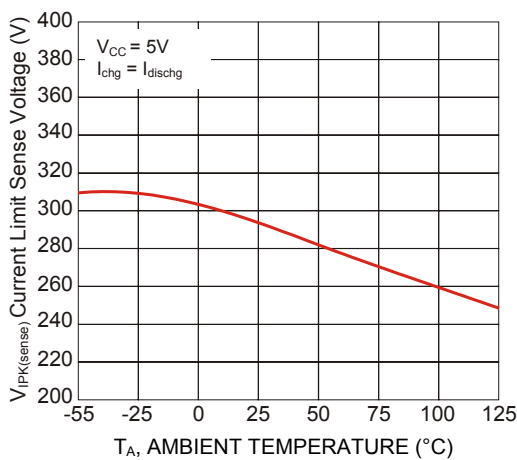


Figure 5: Current Limit Sense Voltage Vs. Temperature

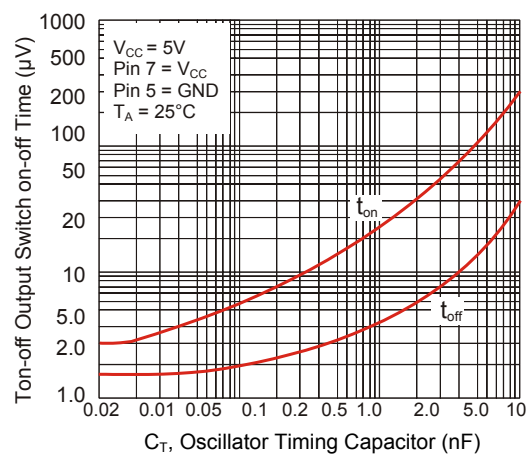
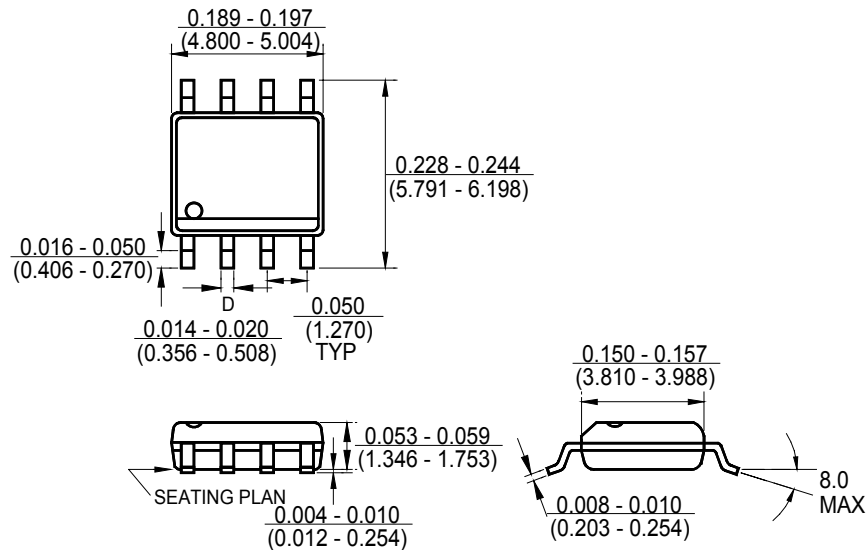
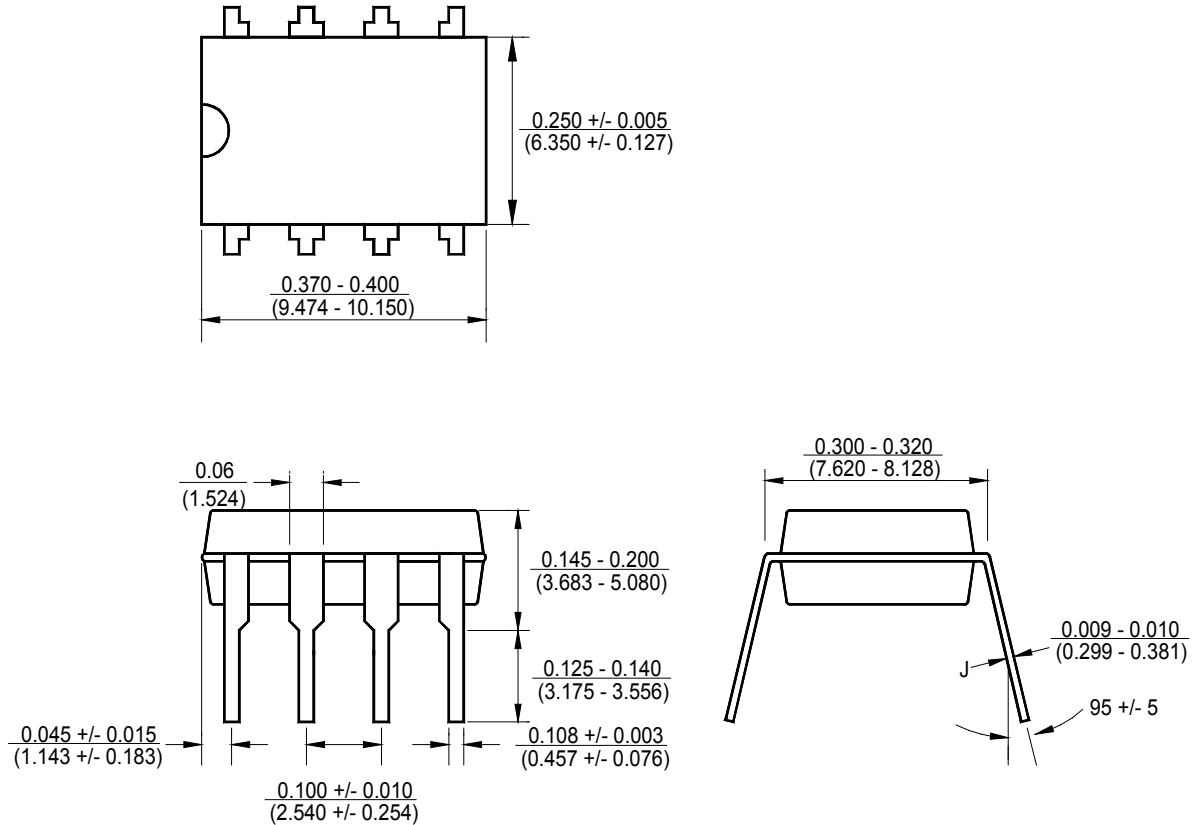


Figure 6: Output Switch On-Off Time vs. Oscillator Timing Capacitor

Package Outline Dimensions – SO 8



Package Outline Dimensions – DIP 8



Ordering Number

GM 34063E S8 R G

APM Gamma	Circuit Type	Package Type	Shipping Type	Blank:
	34063	S8: SO 8	R: Taping & Reel	Pb-free
	34063E	D8: DIP 8	T: Tube	G:Green
	34063F			

Note:

Pb-free products:

- ◆ RoHS compliant and compatible with the current requirements of IPC/JEDEC J-STD-020.
- ◆ Suitable for use in SnPb or Pb-free soldering processes with 100% matte tin (Sn) plating.

Green products:

- ◆ Lead-free (RoHS compliant)
- ◆ Halogen free (Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight)