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FAIRCHILD SEMICONDUCTOR®

June 2008

MC34063A / MC33063A
SMPS Controller

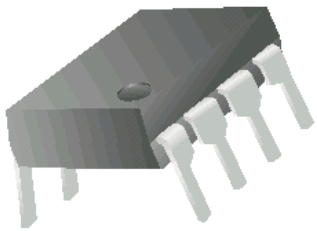
Features

- Operation from 3.0 to 40V Input
- Short Circuit Current Limiting
- Low Standby Current
- Output Switch Current of 1.5A Without External Transistors
- Adjustable Output Voltage
- Frequency of Operation from 100Hz to 100KHz
- Step-up, Step Down, or Inverting Switching Regulators

Description

The MC34063A/MC33063A is a monolithic regulator subsystem intended for a DC to DC converter. The device contains a temperature-compensated bandgap reference, a duty cycle control oscillator, driver, and high-current output switch. It can be used for step-down, step-up, or inverting switching and series pass regulators.

8-DIP



8-SOP

Ordering Information

Part Number	Operating Temperature Range	Eco Status	Package
MC34063AP	0 ~ +70°C	RoHS	8-DIP
MC34063AD	0 ~ +70°C	RoHS	8-SOP
MC33063AP	-40 ~ +85°C	RoHS	8-DIP
MC33063AD	-40 ~ +85°C	RoHS	8-SOP

For Fairchild's definition of "green" Eco Status, please visit: http://www.fairchildsemi.com/company/green/rohs_green.html.

Block Diagram

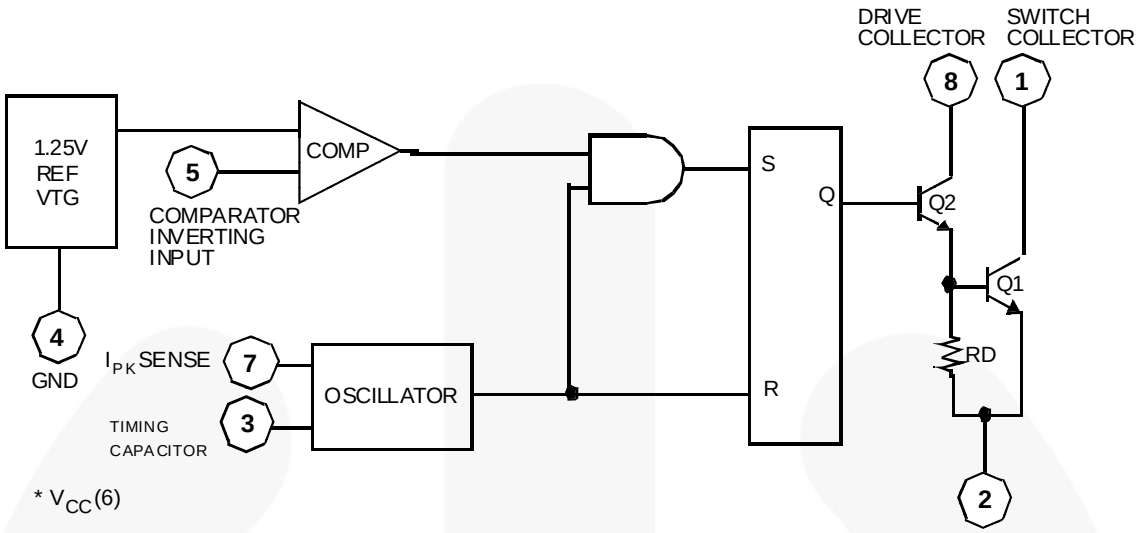


Figure 1. Block Diagram

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter		Min.	Max.	Unit
V_{CC}	Supply Voltage			40	V
$V_{I(COMP)}$	Comparator Input Voltage Range		-0.3	+40	V
$V_{C(SW)}$	Switch Collector Voltage			40	V
$V_{E(SW)}$	Switch Emitter Voltage			40	V
$V_{CE(SW)}$	Switch Collector to Emitter Voltage			40	V
$V_{C(DR)}$	Driver Collector Voltage			40	V
I_{SW}	Switch Current			1.5	A
T_{STG}	Storage Temperature Range		-65	+150	°C
P_D	Power Dissipation	SOP		0.8	W
		DIP		1	

Electrical Characteristics

V_{CC} = 5.0V, T_A = 0°C to +70°C for MC34063, T_A = -40°C to +85°C for MC33063, unless otherwise specified.

Symbol	Parameter		Conditions	Min.	Typ.	Max.	Units
Oscillator							
I_{CHG}	Charging Current		V_{CC}=5 to 40V, T_A=25°C	22	31	42	µA
I_{DISCHG}	Discharging Current		V_{CC}=5 to 40V, T_A=25°C	140	190	260	µA
$V_{(OSC)}$	Oscillator Amplitude		T_A=25°C		0.5		V
K	Discharge-to-Charge Current Ratio		V_7=V_{CC}, T_A=25°C	5.2	6.1	7.5	
$V_{SENSE(CL)}$	Current Limit Sense Voltage		I_{CHG}=I_{DISCHG}, T_A=25°C	250	300	350	mV
Output Switch							
$V_{CE(SAT)1}$	Saturation Voltage 1[1]		I_{SW}=1.0A, $V_{C(driver)}$=$V_{C(SW)}$		0.95	1.30	V
$V_{CE(SAT)2}$	Saturation Voltage 2[1]		I_{SW}=1.0A, $V_{C(driver)}$=50mA		0.45	0.70	V
$G_{I(DC)}$	DC Current Gain[1]		I_{SW}=1.0A, V_{CE}=5.0V, T_A=25°C	50	180		
$I_{C(OFF)}$	Collector Off-State Current[1]		V_{CE}=40V, T_A=25°C		0.01	100.00	µA
Comparator							
V_{TH}	Threshold Voltage			1.21	1.24	1.29	V
ΔV_{TH}	Threshold Voltage Line Regulation		V_{CC}=3 to 40V		2	5	mV
I_{BIAS}	Input Bias Current		V_I=0V		50	400	nA
Total Device							
I_{CC}	Supply Current	MC34063	V_{CC}=5 to 40V, C_T=0.001µF, V_7=V_{CC}, V_5>V_{TH}, pin 2=GND			4	mA
		MC33063				5	

Note:

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

Typical Performance Characteristics

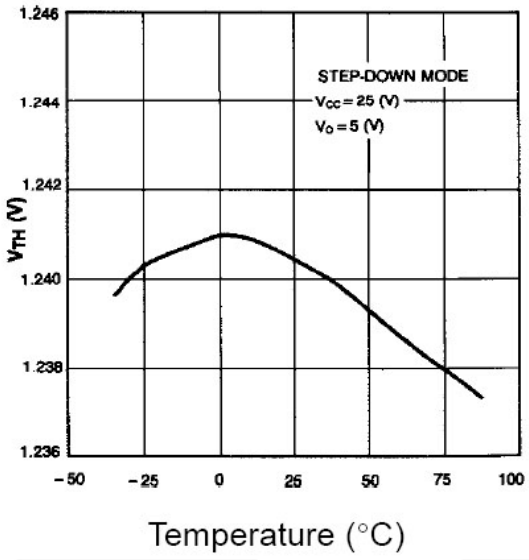


Figure 2. Temperature Drift (V_{TH})

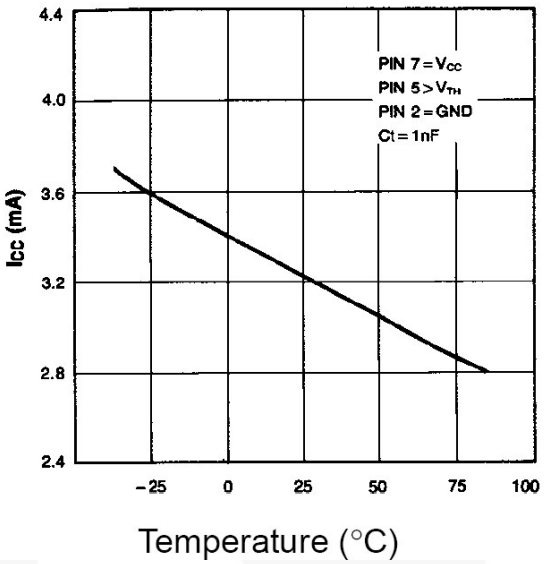
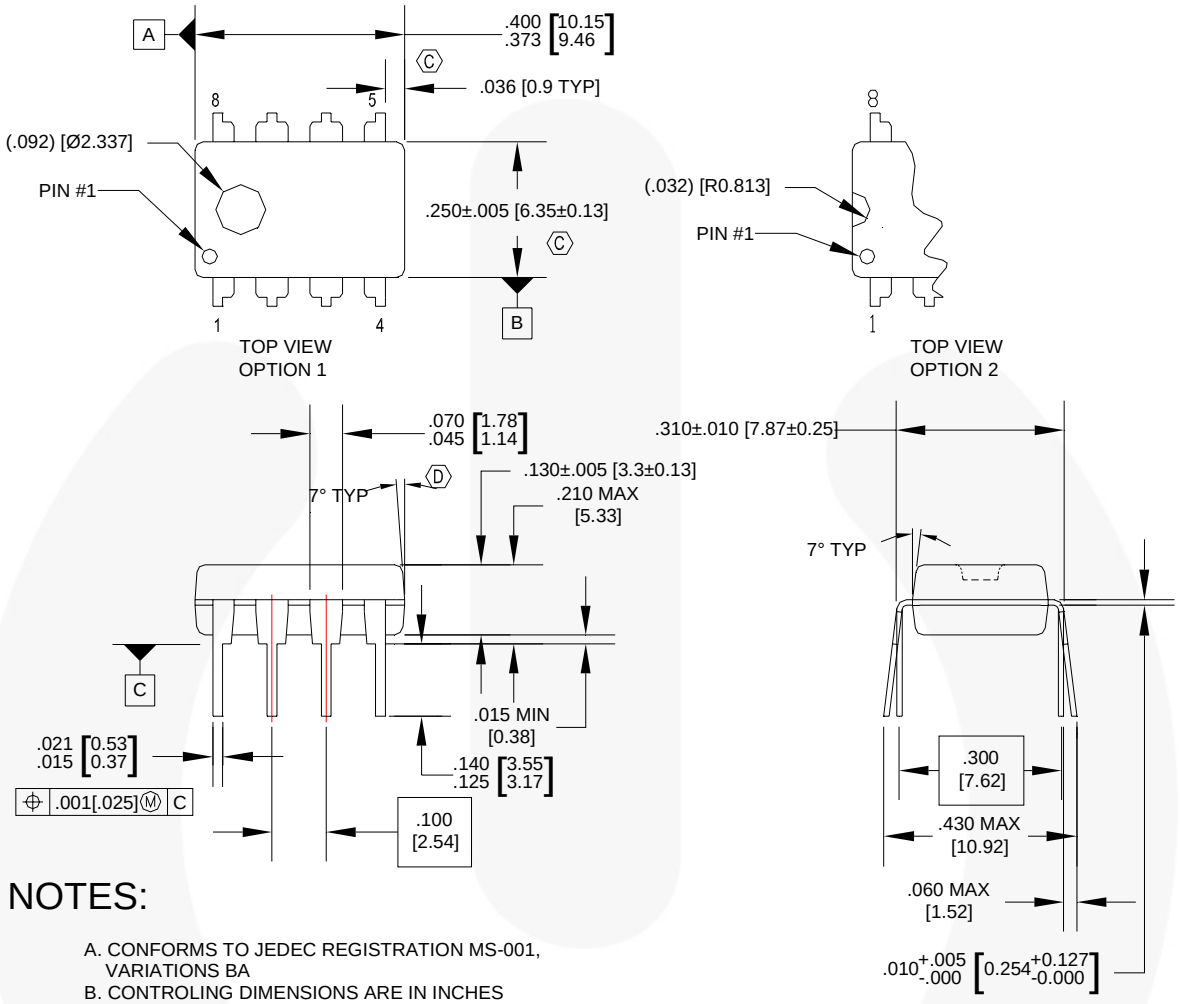


Figure 3. Temperature Drift (I_{OC})

Physical Dimensions



NOTES:

A. CONFORMS TO JEDEC REGISTRATION MS-001, VARIATIONS BA
B. CONTROLING DIMENSIONS ARE IN INCHES
REFERENCE DIMENSIONS ARE IN MILLIMETERS
C. DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED .010 INCHES OR 0.25MM.
D. DOES NOT INCLUDE DAMBAR PROTRUSIONS. DAMBAR PROTRUSIONS SHALL NOT EXCEED .010 INCHES OR 0.25MM.
E. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.

N08EREVG

Figure 4. 8-Lead PDIP, JEDEC MS-001

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Physical Dimensions

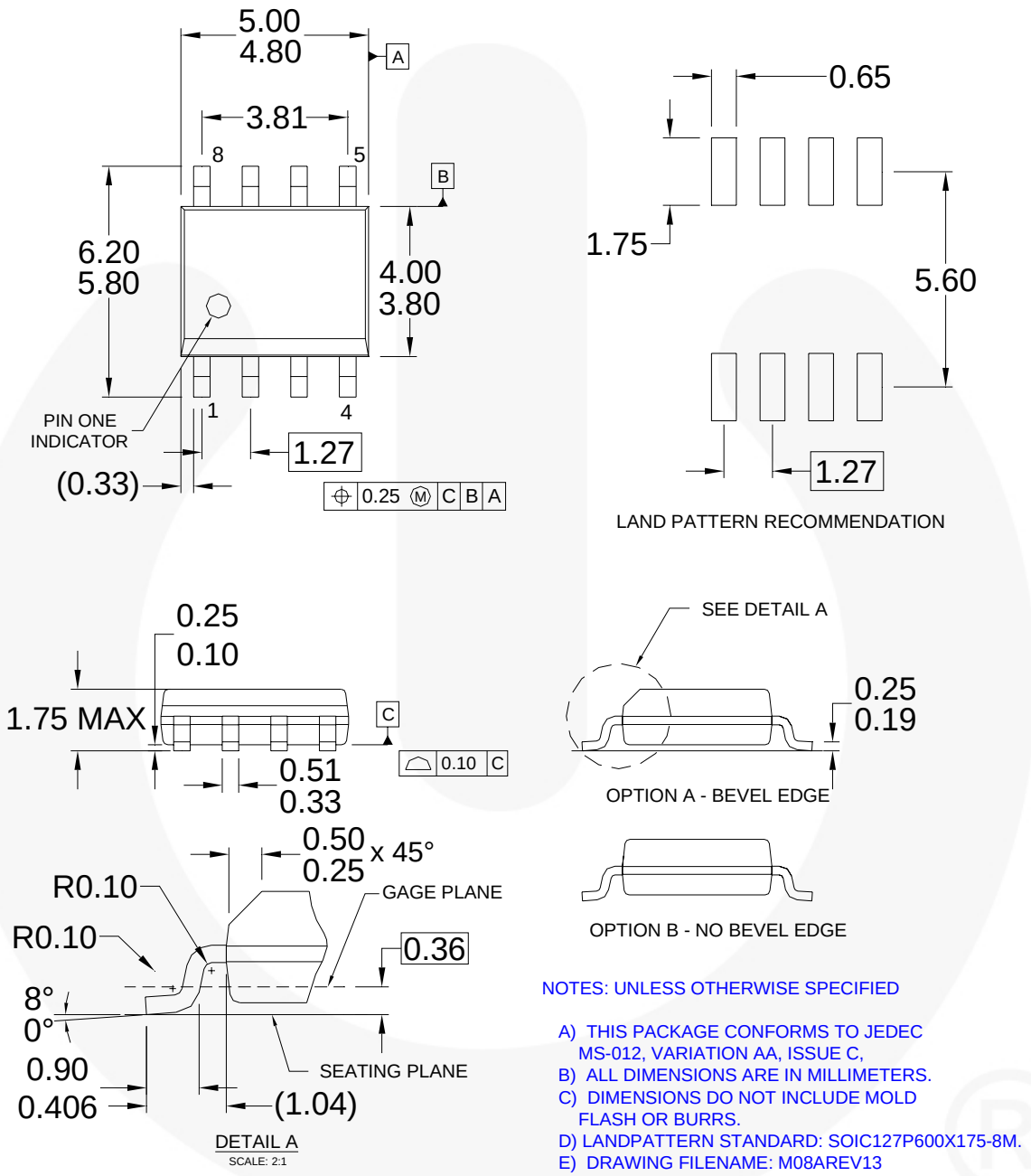

Figure 5. 8-Lead, SOIC, JEDEC MS-012, .150 inch Narrow Body

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