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MC34063A / MC33063A SMPS Controller

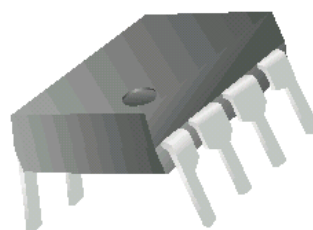
Features

- 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 |

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Block Diagram

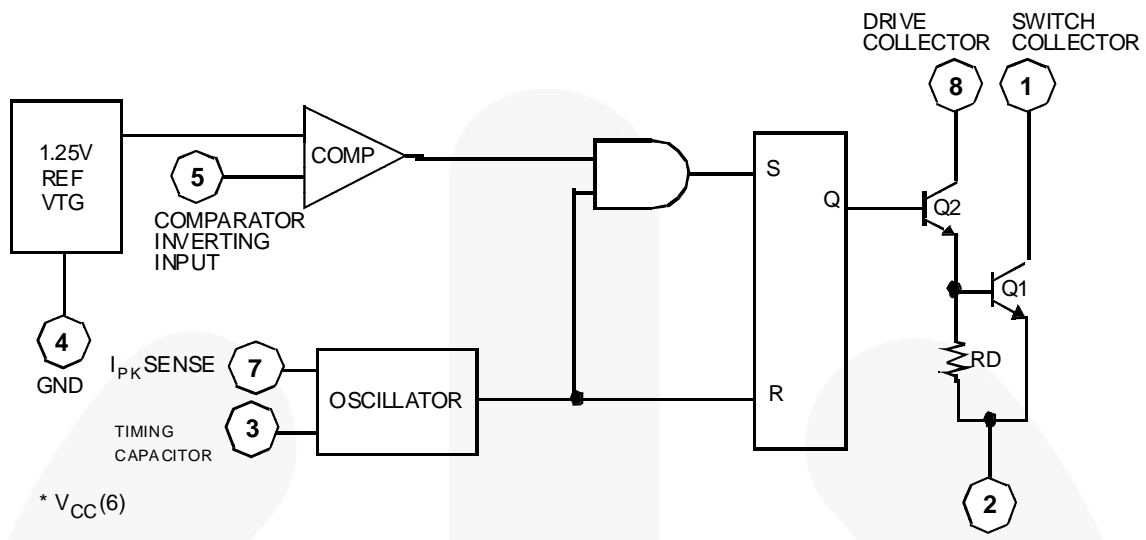


Figure 1. Block Diagram



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

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

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Units |
|----------------------|--|---|---|------|--------|---------|
| Oscillator | | | | | | |
| I_{CHG} | Charging Current | $V_{CC}=5$ to $40V$, $T_A=25^\circ C$ | 22 | 31 | 42 | μA |
| I_{DISCHG} | Discharging Current | $V_{CC}=5$ to $40V$, $T_A=25^\circ C$ | 140 | 190 | 260 | μA |
| $V_{(OSC)}$ | Oscillator Amplitude | $T_A=25^\circ C$ | | 0.5 | | V |
| K | Discharge-to-Charge Current Ratio | $V_7=V_{CC}$, $T_A=25^\circ C$ | 5.2 | 6.1 | 7.5 | |
| $V_{SENSE(CL)}$ | Current Limit Sense Voltage | $I_{CHG}=I_{DISCHG}$, $T_A=25^\circ C$ | 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⁾ | $I_{SW}=1.0A$, $V_{CE}=5.0V$, $T_A=25^\circ C$ | 50 | 180 | | |
| $I_{C(OFF)}$ | Collector Off-State Current ⁽¹⁾ | $V_{CE}=40V$, $T_A=25^\circ C$ | | 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 $40V$, $C_T=0.001\mu F$, $V_7=V_{CC}$, $V_5>V_{TH}$, pin 2=GND | | 4 | mA |
| | | MC33063 | | | 5 | |

Note:

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

Typical Performance Characteristics

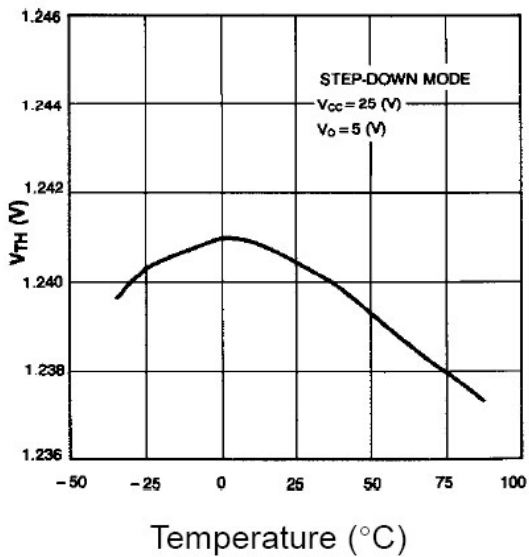


Figure 2. Temperature Drift (V_{TH})

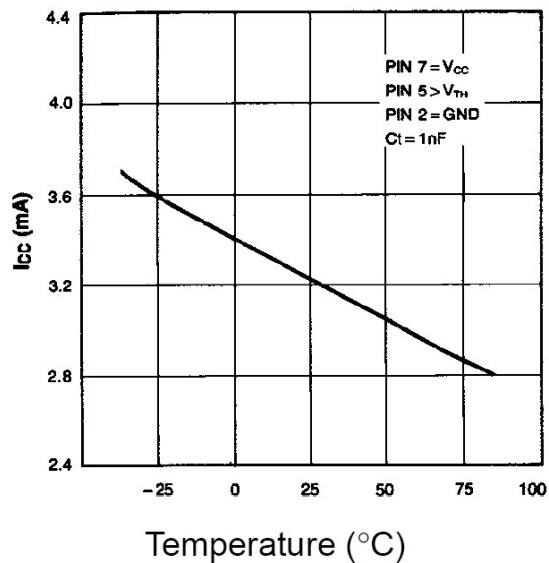
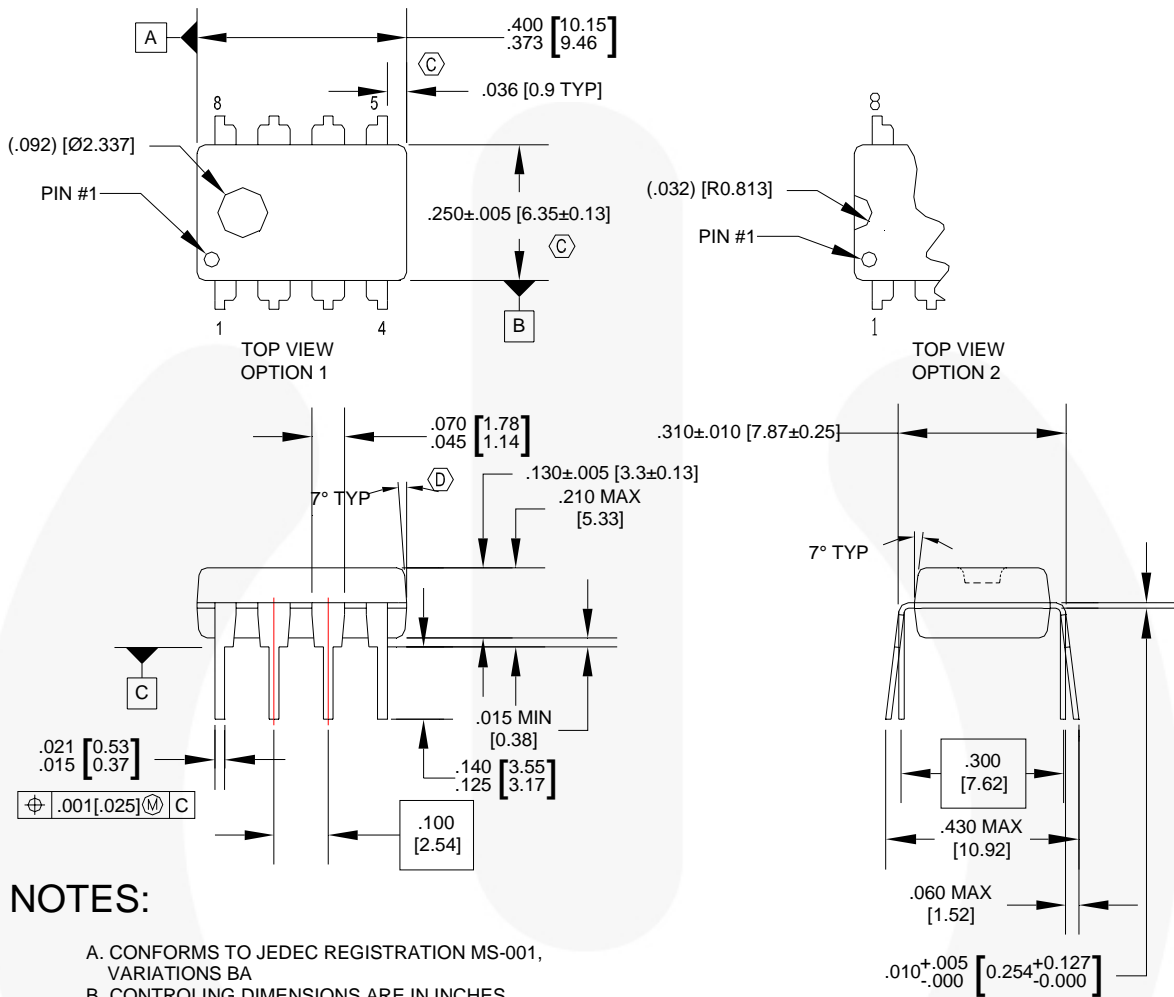


Figure 3. Temperature Drift (I_{CC})

Physical Dimensions



NOTES:

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

N08EREVG

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

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Physical Dimensions

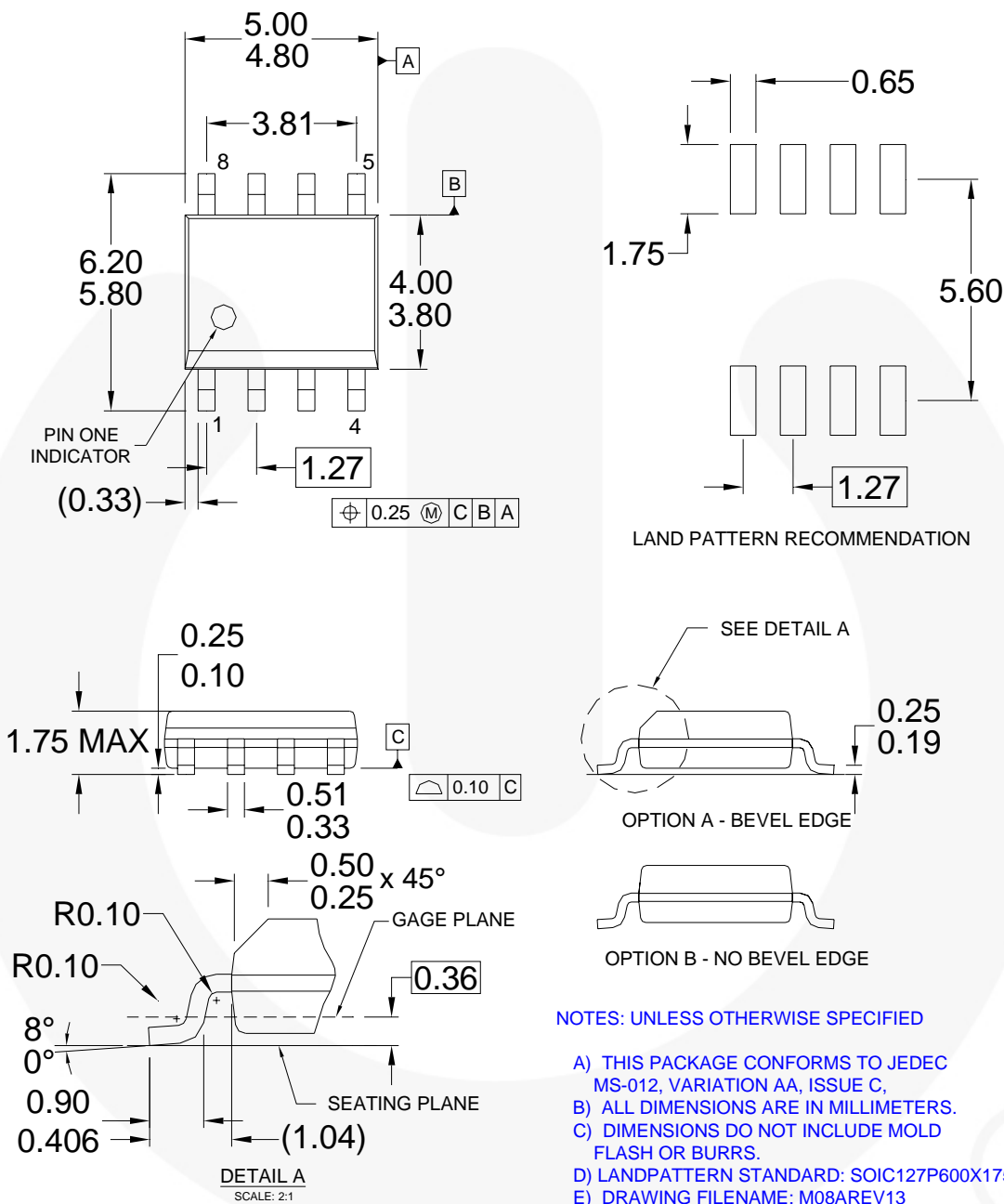


Figure 5. 8-Lead, SOIC, JEDEC MS-012, .150 inch Narrow Body






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