

FEATURES

- Output Switch Current In Excess of 1.5A
- 2% Reference Accuracy
- Low Quiescent Current : 2.5mA(Typ.)
- Operating From 3V to 40V
- Frequency Operation to 100KHz
- Active Current Limiting
- Moisture Sensitivity Level 3 for SMD Package
- TJ34063AG is Halogen Free Products

APPLICATION

- Battery Chargers
- NICs / Switches / Hubs
- ADSL Modems
- Negative Voltage Power Supplies

**ORDERING INFORMATION**

| Device | Package |
|------------|---------|
| TJ34063AGD | SOP-8 |

DESCRIPTION

The TJ34063A series is a monolithic control circuit delivering the main functions for DC-DC voltage converting. The device contains an internal temperature compensated reference, comparator, duty cycle controlled oscillator with an active current limit circuit driver and high current output switch.

Output voltage is adjustable through two external resistors with a 2% reference accuracy.

Employing a minimum number of external components the TJ34063A devices series is designed for Step-Down, Step-Up and Voltage-Inverting applications.

ABSOLUTE MAXIMUM RATINGS (Note 1)

| CHARACTERISTIC | SYMBOL | MIN. | MAX. | UNIT |
|---|-----------|------|------|------|
| Power Supply Voltage | V_{CC} | - | 40 | V |
| Comparator Input Voltage Range | V_{IR} | -0.3 | 40 | V |
| Switch Collector Voltage | V_{SWC} | | 40 | V |
| Switch Emitter Voltage($V_{SWC}=40V$) | V_{SWE} | | 40 | V |
| Switch Collector to Emitter Voltage | V_{CE} | | 40 | V |
| Driver Collector Voltage | V_{dc} | - | 40 | V |
| Driver Collector Current (Note 2) | I_{dc} | - | 100 | mA |
| Switch Current | I_{SW} | - | 1.5 | A |

ABSOLUTE MAXIMUM RATINGS (Continued)

| CHARACTERISTIC | | SYMBOL | MIN. | MAX. | UNIT |
|--|-------|-------------------------|------|------|------|
| Power Dissipation (at T _A = 25°C) | SOP-8 | PD _{MAX_SOP-8} | | 0.76 | W |
| Thermal Resistance(*) | SOP-8 | θ _{JA-SOP-8} | | 130 | °C/W |
| Operating Junction Temperature Range | | T _J | -40 | 150 | °C |
| Storage Temperature Range | | T _{STG} | -65 | 150 | °C |

Note 1. Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.

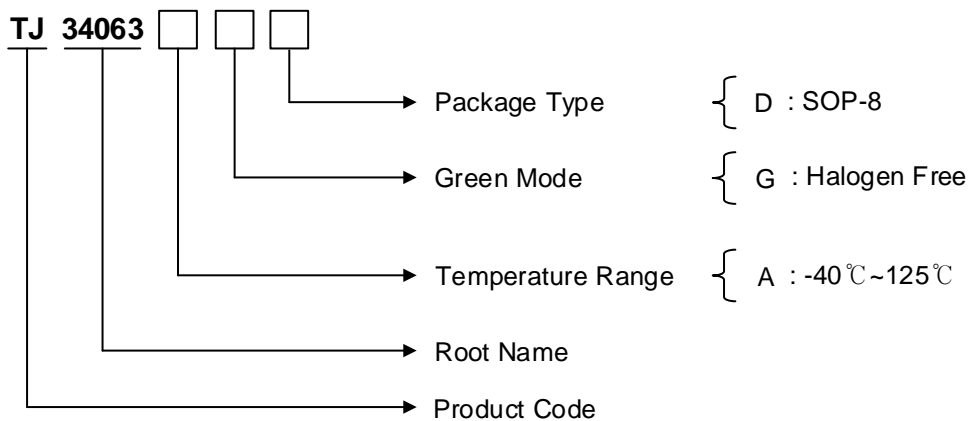
(*) This value depends from thermal design of PCB on which the device is mounted.

RECOMMENDED OPERATING CONDITIONS

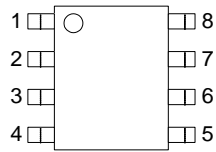
| CHARACTERISTIC | SYMBOL | MIN. | MAX. | UNIT |
|-------------------------------|-----------------|------|------|------|
| Supply Voltage | V _{CC} | 3 | 40 | V |
| Operating Ambient Temperature | T _A | -40 | 125 | °C |

ORDERING INFORMATION

| Package | Order No. | Description | Supplied As | Status |
|---------|------------|--------------|-------------|--------|
| SOP-8 | TJ34063AGD | 1.5A, 100kHz | Reel | Active |



PIN CONFIGURATION

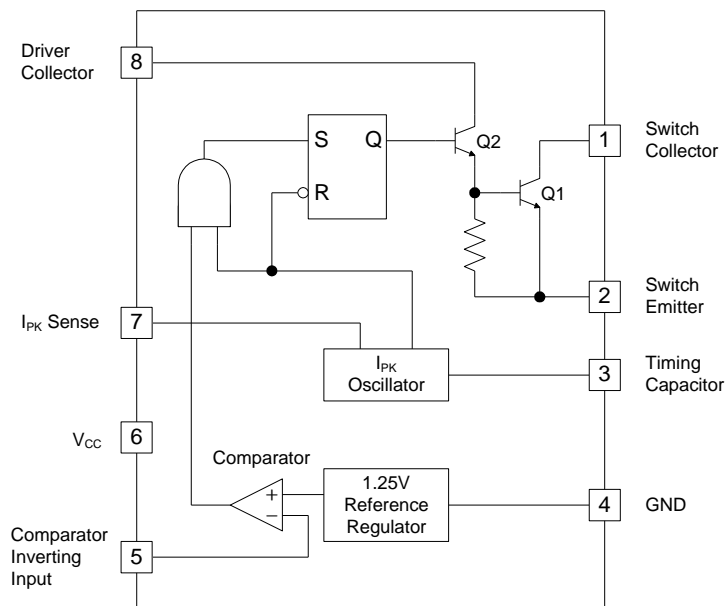


SOP-8

PIN DESCRIPTION

| Pin No. | SOP-8 PKG | |
|---------|----------------------------|--|
| | Name | Function |
| 1 | Switch Collector | Internal switch transistor collector |
| 2 | Switch Emitter | Internal switch transistor emitter |
| 3 | Timing Capacitor | Timing Capacitor to control the switching frequency |
| 4 | GND | Ground pin for all internal circuits |
| 5 | Comparator Inverting Input | Inverting input pin for internal comparator |
| 6 | V _{CC} | Voltage supply |
| 7 | I _{PK} Sense | Peak Current Sense Input by monitoring the voltage drop across an external I sense resistor to limit the peak current through the switch |
| 8 | Driver Collector | Voltage driver collector |

BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS

(Refer to the test circuits, $V_{CC}=5V$, $T_A=T_{LOW}$ to T_{HIGH} , unless otherwise specified, see note 2)

| SYMBOL | PARAMETER | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|----------------------|---|--|-------|------|-------|---------|
| OSCILLATOR | | | | | | |
| F_{OSC} | Frequency | $V_{PIN5}=0V$, $C_T=1nF$, $T_A=25^\circ C$ | 24 | 33 | 42 | KHz |
| I_{CHG} | Charge Current | $V_{CC}=5$ to $40V$, $T_A=25^\circ C$ | 24 | 35 | 42 | μA |
| I_{DISCHG} | Discharge Current | $V_{CC}=5$ to $40V$, $T_A=25^\circ C$ | 140 | 220 | 260 | μA |
| I_{DISCHG}/I_{CHG} | Discharge to Charge Current Ratio | Pin 7 = V_{CC} , $T_A=25^\circ C$ | 5.2 | 6.5 | 7.5 | |
| $V_{IPK(SENSE)}$ | Current Limit Sense Voltage | $I_{CHG}=I_{DISCHG}$, $T_A=25^\circ C$ | 250 | 300 | 350 | mV |
| OUTPUT SWITCH | | | | | | |
| $V_{CE(SAT)}$ | Saturation Voltage, Darlington connection | $I_{SW}=1A$, Pins 1,8 connected | | 1.0 | 1.3 | V |
| $V_{CE(SAT)}$ | Saturation Voltage | $I_{SW}=1A$, $R_{PIN8}=82\Omega$ to V_{CC} , Forced $\beta \sim 20$ | | 0.45 | 0.7 | V |
| h_{FE} | DC Current Gain | $I_{SW}=1A$, $V_{CE}=5V$, $T_A=25^\circ C$ | 50 | 75 | | |
| $I_{C(OFF)}$ | Collector Off-State Current | $V_{CE}=40V$ | | 1.0 | 100 | μA |
| COMPARATOR | | | | | | |
| V_{TH} | Threshold Voltage | $T_A=25^\circ C$ | 1.225 | 1.25 | 1.275 | V |
| | | $T_A=T_{LOW}$ to T_{HIGH} | 1.21 | | 1.29 | V |
| REG_{LINE} | Threshold Voltage Line Regulation | $V_{CC}=3$ to $40V$ | | 1.4 | 5 | mV |
| I_{IB} | Input Bias Current | $V_{IN}=0V$ | | -20 | -400 | nA |
| TOTAL DEVICE | | | | | | |
| I_{CC} | Supply Current | $V_{CC}=5$ to $40V$, $C_T=1nF$ Pin7 = V_{CC} , $V_{PIN5}>V_{TH}$, Pin2=GND Remaining pins open | | 1.4 | 4 | mA |

Note 1. Maximum package power dissipation limit must be observed.

Note 2. $T_{LOW} = -40^\circ C$, $T_{HIGH} = +125^\circ C$

Note 3. If Darlington configuration is not used, care must be taken to avoid deep saturation of output switch.

The resulting switch-off time may be adversely affected.

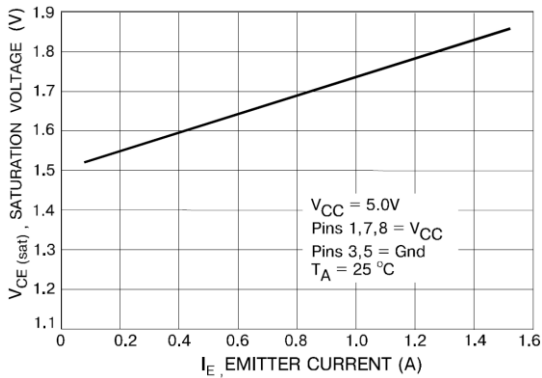
In a Darlington configuration the following output driver condition is suggested:

$$\text{Forced } \beta \text{ of output switch : } \frac{I_{C(OUTPUT)}}{I_{C(DRIVER)} - 7.0mA} \geq 10$$

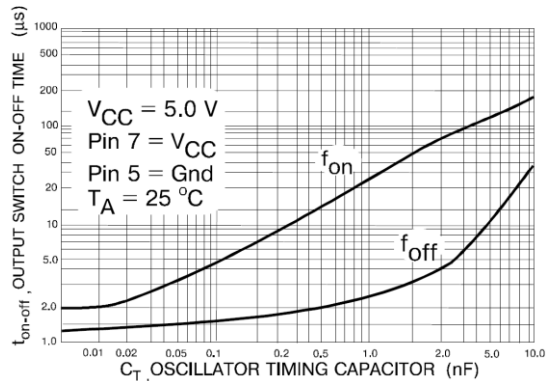
* Currentless due to a built in $1K\Omega$ anti-leakage resistor

TYPICAL ELECTRICAL CHARACTERISTICS

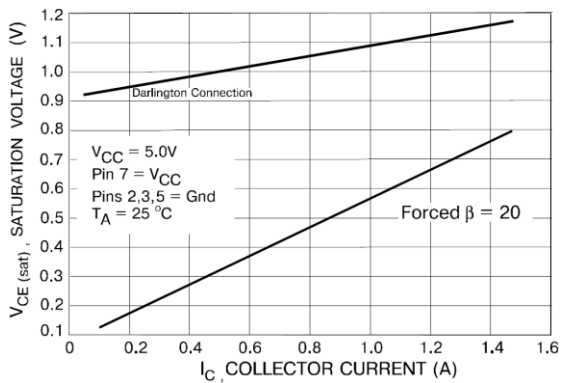
Emitter Follower Configuration Output Saturation Voltage vs. Emitter Current



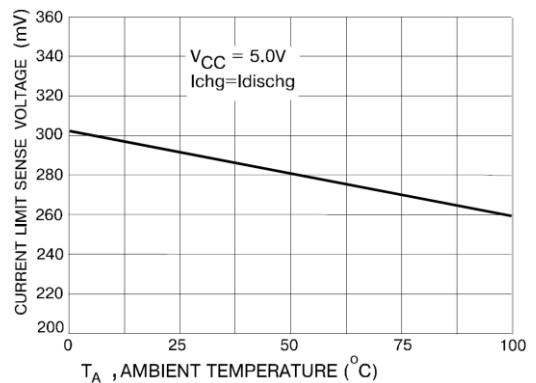
Output Switch ON-OFF Time vs. Oscillator Timing Capacitor



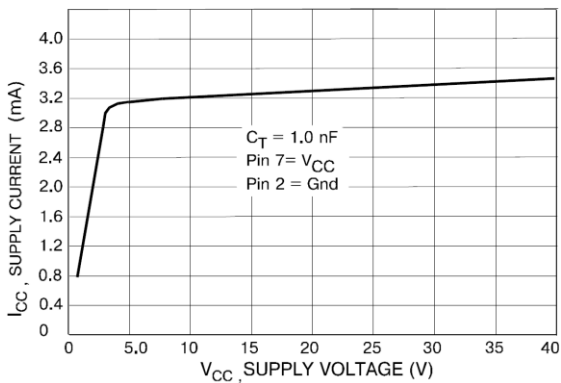
Common Emitter Configuration Output Switch Saturation Voltage vs. Collector Current



Current Limit Sense Voltage (VIPK) vs. Temperature

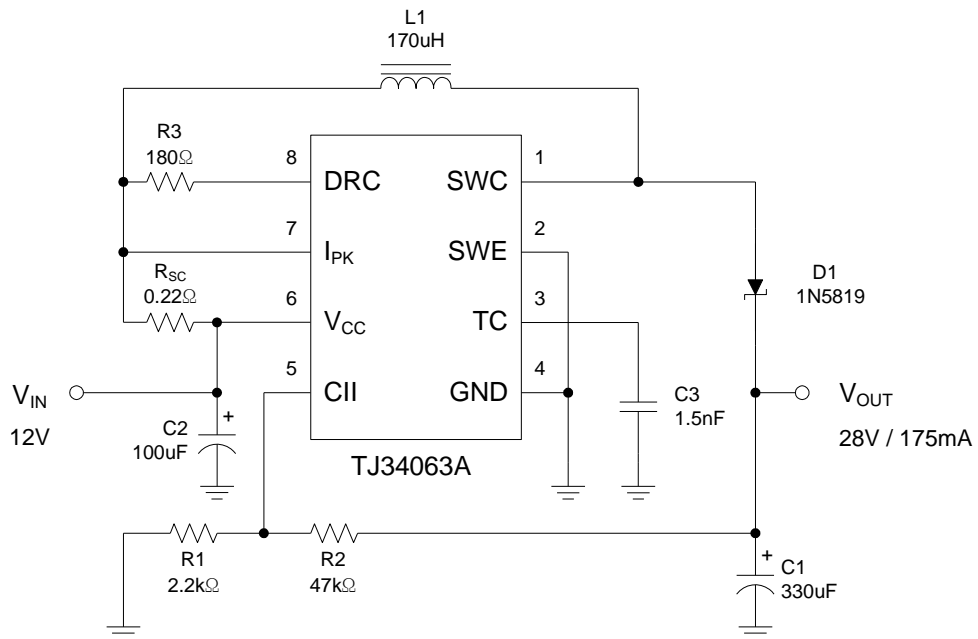


Standby supply current vs. Supply voltage

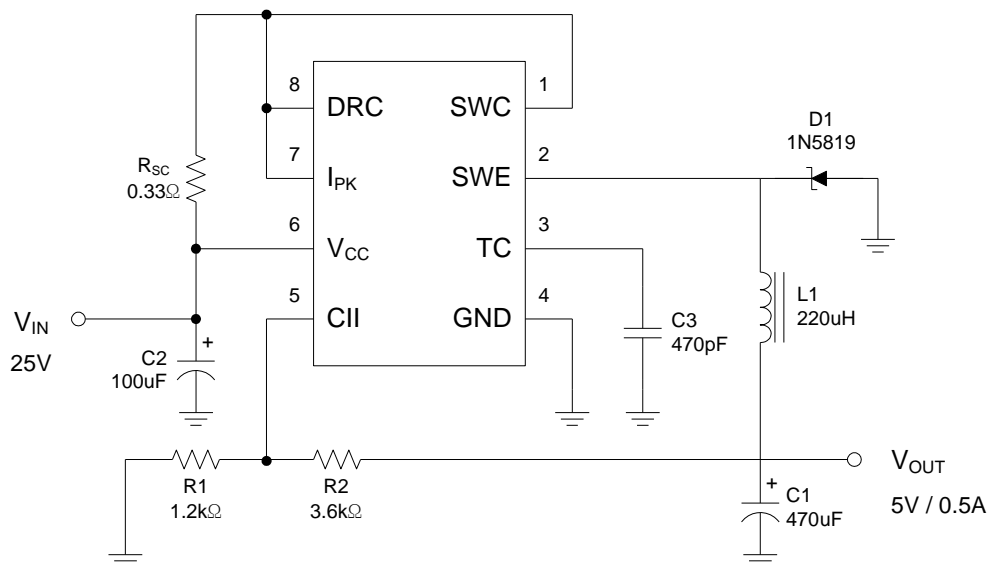


TYPICAL APPLICATION CIRCUIT

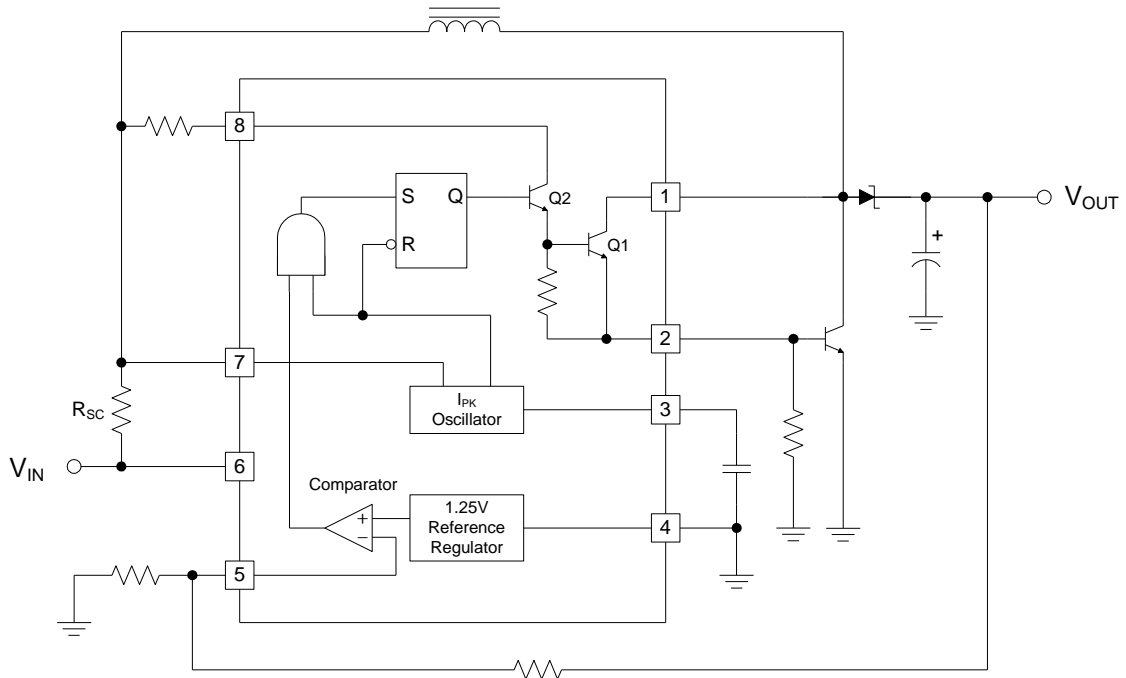
Step-Up Converter



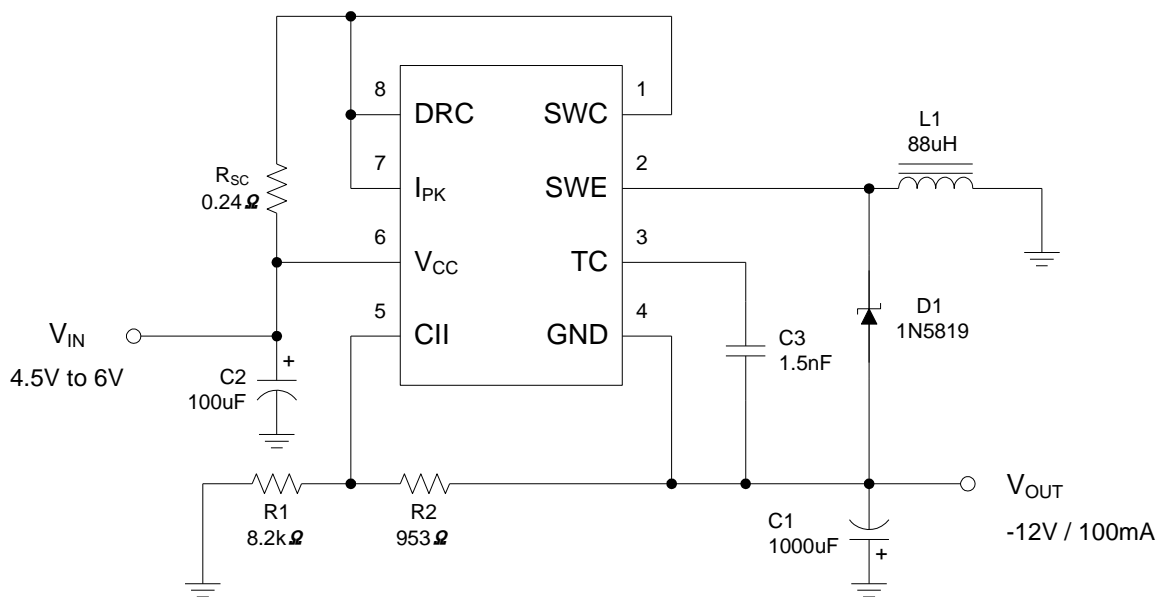
Step-Down Converter



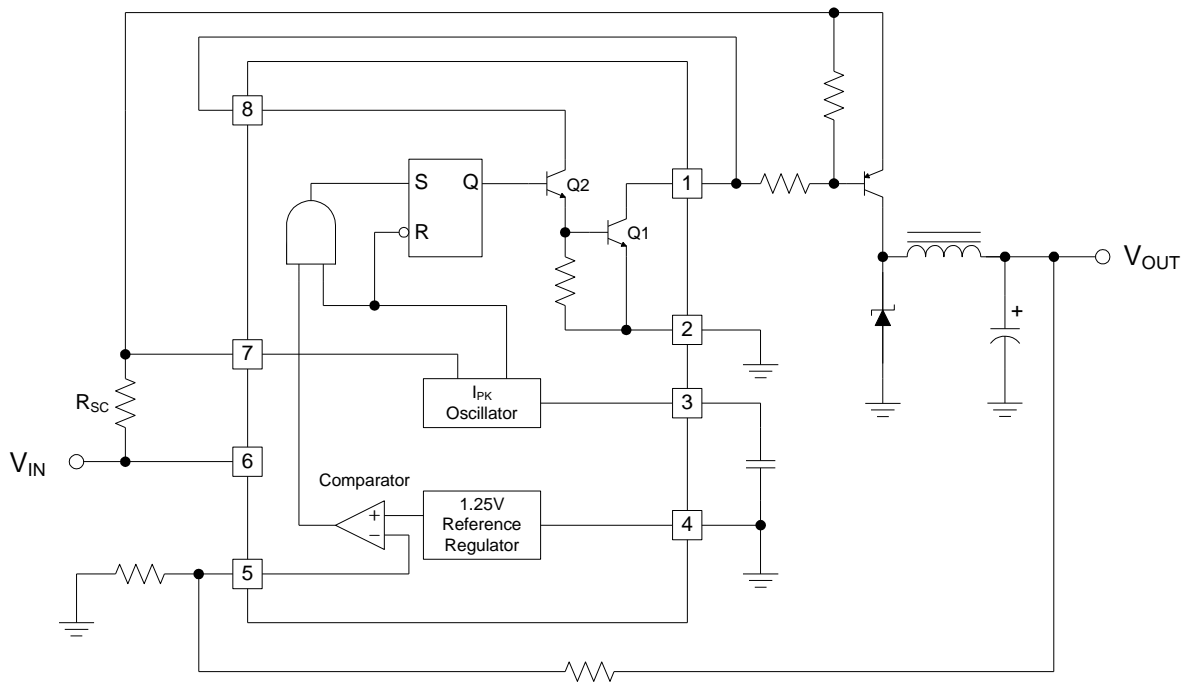
Step-Up with External NPN Switch



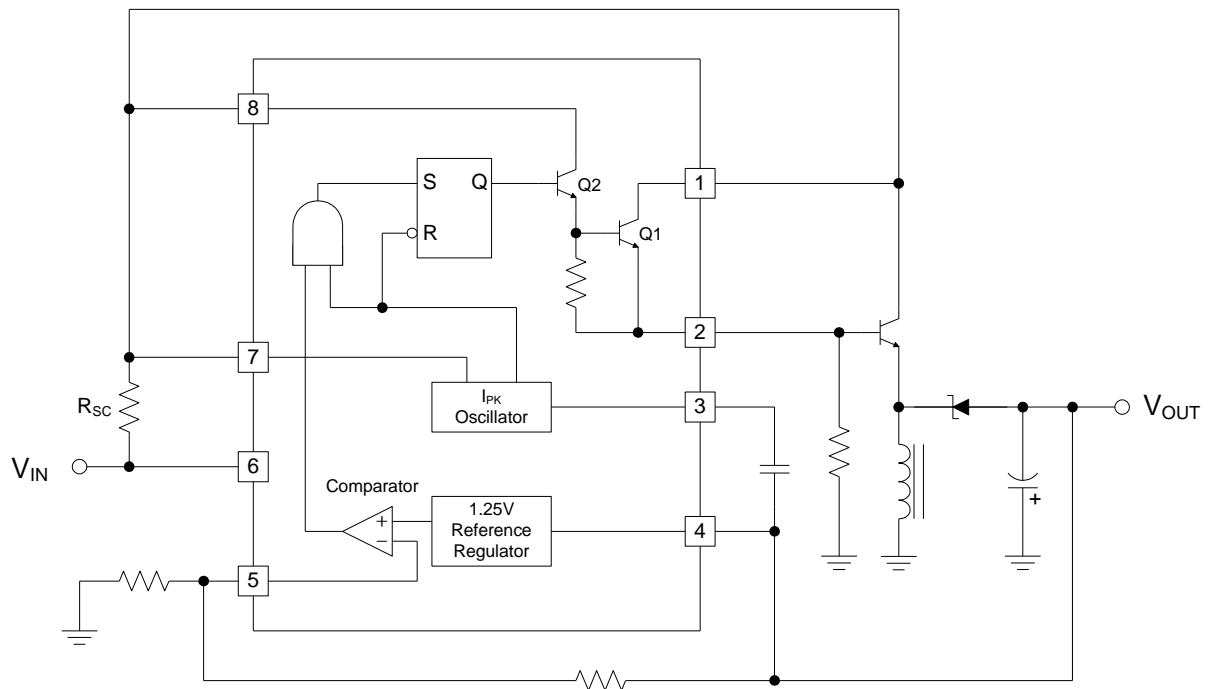
Voltage Inverting Converter



Step-Down with External PNP Switch



Voltage Inverting with External NPN Switch



REVISION NOTICE

The description in this datasheet can be revised without any notice to describe its electrical characteristic properly.

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