

## Summary

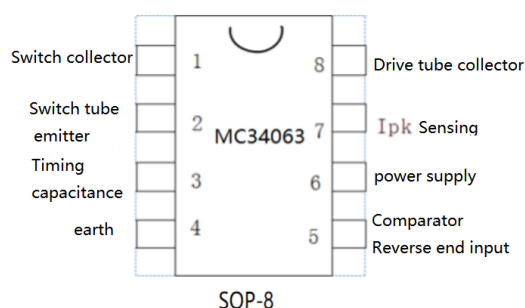
MC34063ADR is a single-chip DC-DC converter integrated circuit with a reference voltage source for temperature compensation (1.25V), comparator, oscillator, driver and high current output switch tube which can effectively limit the current and control the working cycle. With a few external components, the DC-DC converter with boost, buck and voltage reversal can be formed.

The circuit is packaged in SOP8.

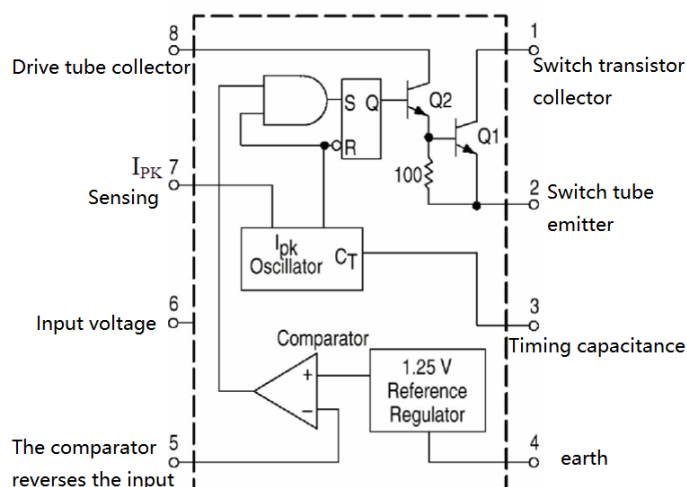
## Main features

- The working voltage range is 3.0V-32V
- The static current is small
- Pin layout
- It has output current limit function and output current protection function
- The limit current of the output switch is 1.2A
- Adjustable output voltage
- The working frequency can reach 100kHz
- Internal reference voltage accuracy 2%

## Pin arrangement



## Functional block diagram



## DC-DC conversion control circuit

## Function description of outlet

| Balloon | Function         | Symbol | Balloon | Function                 | Symbol |
|---------|------------------|--------|---------|--------------------------|--------|
| 1       | Switch collector | SC     | 5       | Comparator reverse input | FB     |
| 2       | Switch emitter   | SE     | 6       | input voltage            | VCC    |
| 3       | Timing capacitor | CT     | 7       | check measure            | IpK    |
| 4       | land             | GND    | 8       | Driving tube collector   | DC     |

## Limit value

| Parameter name                                       | Symbol      | numerical value |         | Company |
|------------------------------------------------------|-------------|-----------------|---------|---------|
|                                                      |             | minimum         | maximum |         |
| supply voltage                                       | Vcc         |                 | 32      | V       |
| Comparator input voltage range                       | VIR         | - 0.3           | 30      | V       |
| Output collector voltage                             | Vc(switch)  |                 | 32      | V       |
| Output tube emitter voltage (vpin1 = 32V)            | VE(switch)  |                 | 32      | V       |
| Voltage between collector and emitter of output tube | VCE(switch) |                 | 32      | V       |
| Driving tube collector voltage                       | Vc(driver)  |                 | 32      | V       |
| Driving tube collector current                       | Ic(driver)  |                 | 100     | mA      |
| Output current                                       | ISW         |                 | 1.2     | A       |
| power waste                                          | PD          |                 | 1.25    | W       |
| Working environment temperature                      | TA          | 0               | +70     | °C      |
| Storage temperature                                  | Tstg        | - 65            | +150    | °C      |

## Electrical characteristics (VCC = 5.0V; TA = 0°C ~ 70 °C, unless otherwise specified)

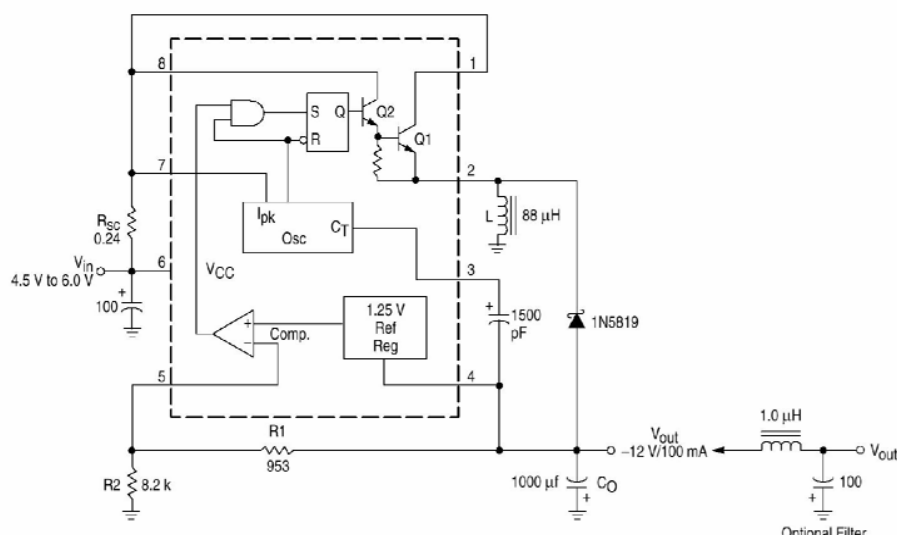
| Characteristic conditions                                       | Symbol                | Specification value |         |         | Unit |
|-----------------------------------------------------------------|-----------------------|---------------------|---------|---------|------|
|                                                                 |                       | minimum             | typical | maximum |      |
| Oscillator part                                                 |                       |                     |         |         |      |
| Oscillation frequency (vpin5 = 0V, CT = 1.0nf, Ta = 25 °C )     | fosc                  | 24                  | 33      | 42      | KHz  |
| Charging current (VCC = 5.0V ~ 32V, Ta = 25°C )                 | Ichg                  | 24                  | 33      | 42      | uA   |
| Discharge current (VCC = 5.0V ~ 32V, Ta = 25°C )                | Idischg               | 140                 | 200     | 260     | uA   |
| Ratio of discharge to charging current (vpin7 = VCC, TA = 25°C) | Idischg/Ichg          | 5.2                 | 6.2     | 7.5     | --   |
| Current limiter ( Ichg=Idischg, TA= 25 °C )                     | V <sub>PK</sub>       | 250                 | 300     | 350     | mV   |
| Output part:                                                    |                       |                     |         |         |      |
| Saturation pressure drop (ISW = 1.0A, pin1,8connection)         | V <sub>CE(sat)</sub>  | --                  | 1.0     | 1.3     | V    |
| Saturation pressure drop (ISW = 1.0A, rpin8 = 82 to VCC)        | V <sub>CE(sat)</sub>  | --                  | 0.45    | 0.7     | V    |
| DC amplification factor (ISW = 1a, VCE = 5V, Ta =25 °C )        | hfe                   | 50                  | 120     | --      | --   |
| Collector leakage current (VCE = 30V)                           | I <sub>C( off )</sub> | --                  | 0.01    | 100     | uA   |
| Characteristic conditions                                       | Symbol                | Specification value |         |         | Unit |

## DC-DC conversion control circuit

|                                                                                                                       |                 | minimum      | typical    | maximum      |    |
|-----------------------------------------------------------------------------------------------------------------------|-----------------|--------------|------------|--------------|----|
| Comparator part:                                                                                                      |                 |              |            |              |    |
| Threshold voltage<br>(TA = 25°C ) (TA = 0 ~ 70°C)                                                                     | Vth             | 1.23<br>1.21 | 1.25<br>-- | 1.27<br>1.29 | V  |
| Input bias current (VIN = 0V)                                                                                         | I <sub>IB</sub> | --           | - 40       | - 400        | nA |
| Threshold voltage linear adjustment rate (VCC = 3.0 ~ 30V)                                                            | Regline         | --           | 1.4        | 5.0          | mV |
| Overall part:                                                                                                         |                 |              |            |              |    |
| Power supply current (VCC = 5.0V ~ 30V, CT =1.0nf,<br>vpin7 = VCC, vpin5 > Vth, vpin2 = GND,<br>others are suspended) | ICC             | ----         | 2.5        | 4.0          | mA |

### Application circuit diagram

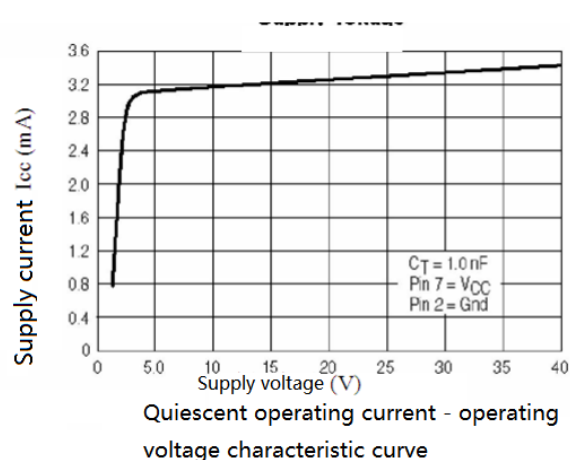
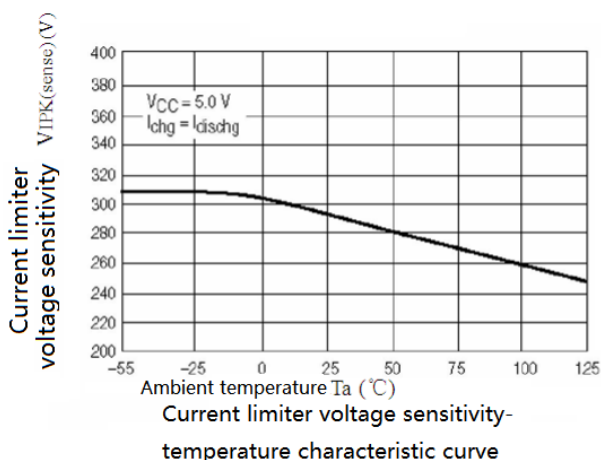
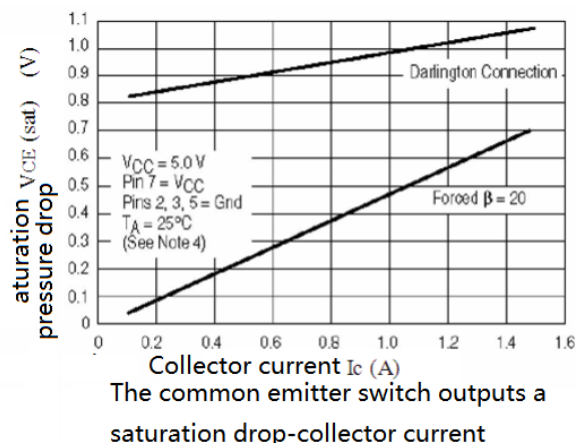
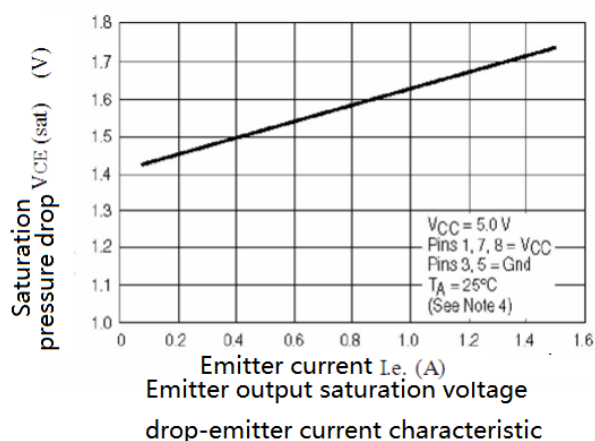
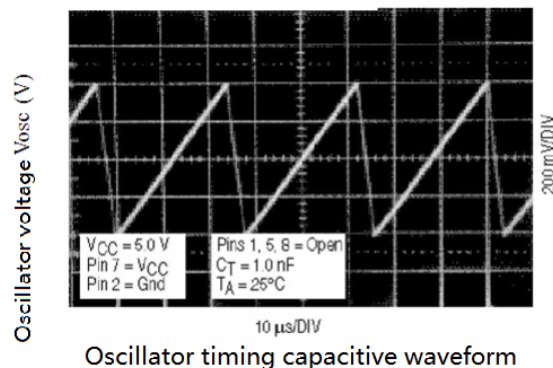
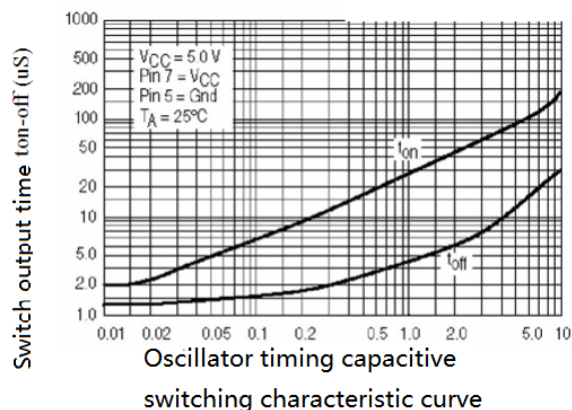
### Mc34063 as reverse DC-DC converter



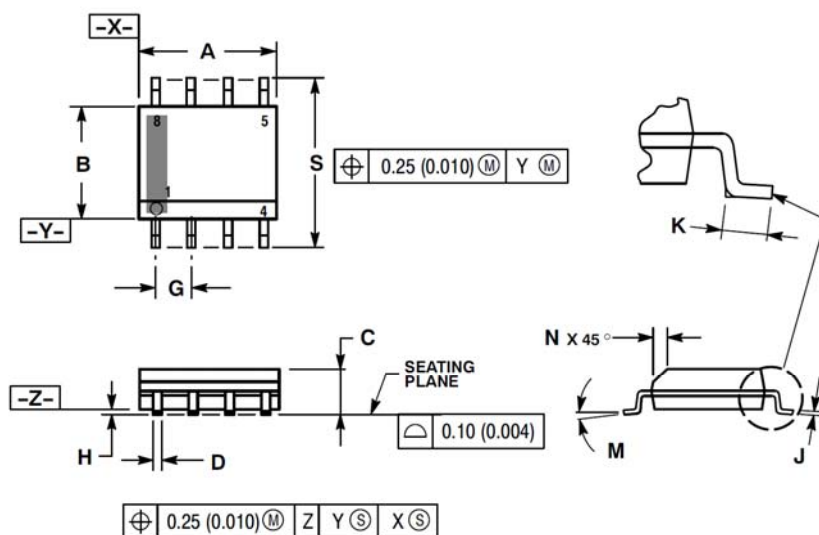
As shown in Fig. 3, the voltage ripple and noise can be further reduced after the LC filter is added. The characteristics are shown in the table below

| Parameter                | Test conditions                  | Result           |
|--------------------------|----------------------------------|------------------|
| Linear adjustment rate   | $V_{IN}=4.5\sim 6.0V, I_o=100mA$ | $3.0mV=0.012\%$  |
| Load adjustment rate     | $V_{IN}=5.0V, I_o=10\sim 100mA$  | $0.022V=+0.09\%$ |
| Output ripple            | $V_{IN}=5.0V, I_o=100mA$         | 500mVpp          |
| Circuit limiting current | $V_{IN}=5.0V, R_L=0.1$           | 910mA            |
| efficiency               | $V_{IN}=5.0V, I_o=100mA$         | 64.5%            |
| Output ripple            | $V_{IN}=5.0V, I_o=100mA$         | 70mVpp           |

## Characte ristic curve



## Encapsulation information



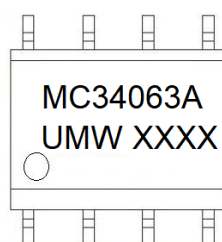
### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

| DIM | MILLIMETERS |      | INCHES    |       |
|-----|-------------|------|-----------|-------|
|     | MIN         | MAX  | MIN       | MAX   |
| A   | 4.80        | 5.00 | 0.189     | 0.197 |
| B   | 3.80        | 4.00 | 0.150     | 0.157 |
| C   | 1.35        | 1.75 | 0.053     | 0.069 |
| D   | 0.33        | 0.51 | 0.013     | 0.020 |
| G   | 1.27 BSC    |      | 0.050 BSC |       |
| H   | 0.10        | 0.25 | 0.004     | 0.010 |
| J   | 0.19        | 0.25 | 0.007     | 0.010 |
| K   | 0.40        | 1.27 | 0.016     | 0.050 |
| M   | 0°          | 8°   | 0°        | 8°    |
| N   | 0.25        | 0.50 | 0.010     | 0.020 |
| S   | 5.80        | 6.20 | 0.228     | 0.244 |

SOP8

## Marking



## ORDERING INFORMATION

| Order code     | Package | Baseqty | Deliverymode  |
|----------------|---------|---------|---------------|
| UMW MC34063ADR | SOP-8   | 2500    | Tape and reel |